Information Requirements in Natural Resources Law: Geothermal, Fisheries and Petroleum Compared

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A thesis

submitted in fulfilment

of the requirements for the degree

of

Doctor of Philosophy

at

The University of Waikato

THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

2022

Abstract

The purpose of this research is to demonstrate the key role of legal provisions for information in natural resource law, particularly legal provisions within a resource manager and resource developer relationship. Using three legislative regimes, the research examines and compares information provisions' functions substantively and procedurally. The research shows that limitations in existing provisions for information under these regimes provide important lessons for articulating optimum legal characteristics for information provisions in natural resources law for the future. The main research question: What legal characteristics are desirable in information requirements for managing natural resources? guides the analysis.

Information is at the heart of natural resource decision-making. Information provisions are instrumental in assessing the practical, economic and legal feasibility of resource development and in gauging a resource developer's compliance with law. To understand what legal characteristics are desirable in information provisions, the thesis compares the management of three natural resources: the geothermal resource under the Resource Management Act 1991, the ocean fisheries resource under the Fisheries Act 1996, and the petroleum resource under the Crown Minerals Act 1991. In New Zealand, either a central or regional government agency authorises and manages the use of these "subsurface" resources, with statutory requirements for information applying to both a state agency (the resource manager) and to a private developer exploiting a resource. Public accountability for resource management is established through the provision of accurate and relevant information.

The thesis uses a natural resource law lens to examine the (usually) bilateral agreement between resource manager and resource developer. Such agreements take the form of a resource-use permit or licence. To ensure that the terms of the agreement are met, a resource user must regularly provide an agency with information (and data) on how a resource is exploited. Under each legislative regime, non-statutory information management tools such as adaptive management and technical peer review facilitate and provide oversight of the natural resource agreement. The thesis analyses these mechanisms including the use of technical modelling as a regulatory tool. Using regulation theory, the research also explores the influence of the regulatory relationship on the fulfilment of information provisions and the extent to which resource users are involved in rule development and resource co-management, revealing how information problems can arise with process informality and public accountability.

The research is significant overall because increasing demands on natural resources mean accountable decision-making is increasingly expected. Justifiable and defensible reasons for decisions are vital to long-term sustainable resource management and to human survival and flourishing. While economic justifications for resource development remain relevant, the thesis demonstrates that equitable resource management that benefits multiple interests, including the rights of Māori in natural resources, is needed.

Significantly, despite substantial advances in industrial-scale geothermal resource exploitation and significant developments in geothermal policy and rules in New Zealand, no thorough legal analysis of geothermal resource management law has occurred in recent decades. By using the geothermal resource as its main case study resource, this research fills a gap in the legal literature. A review of geothermal resources law is therefore valuable and timely in guiding the future management of geothermal resources into a low-carbon energy future.

Commonalities in information challenges across the three resources examined emphasise the key role of legal provisions for information broadly in natural resources law. As Aotearoa New Zealand proceeds with its largest suite of resource management law reform in thirty years, the key role of legal provisions for information in natural resources law must be realised. The study concludes that legal provisions for information in natural resources law must support multilateral interests, contain functional clarity, and provide formalised processes and links with meta-goals that reach beyond each legal regime's purpose.

Preface and Acknowledgements

A memorandum of understanding between the University of Waikato and the Waikato Regional Council enabled the following research in legal questions about geothermal resource management. Research funding was provided by the Waikato Regional Council, by Hamilton, Waikato region law firm, Norris Ward McKinnon, and by the International Bar Association Section on Energy, Environment, Natural Resources and Infrastructure Law. I express my sincere thanks for this support and for the opportunity to pursue my doctorate.

Many experts in their fields, particularly in geothermal resource management (engineers, scientists and policy development specialists), were generous with their time in explaining the practical aspects of their work and in relation to the application of law. Thanks especially, regional council staff, Dr Jim McLeod, Katherine Luketina, and Penny Doorman. The learning opportunities provided through co-authoring and by way of geothermal workshop and conference attendances were all part of your generous encouragement. Any errors of interpretation are my own. A big thank you to Dr Juliet Newson at Iceland School of Energy, Reykjavik University for hosting my Iceland visit.

None of this would have been possible without the matchless support and guidance of my chief academic supervisor, Professor Barry Barton. Thank you, Barry, for providing me with the experiences and learning on my doctoral journey—and for a fascinating research topic when I knocked on your door to ask, “What needs researching?!” Professor Dr Valmaine Toki, as second supervisor your knowledge and balancing of the keel in areas affecting Māori especially were necessary, enriching and much appreciated. Mihi mai i te rire o toku ngakau, thank you from the bottom of my heart. I acknowledge the late Matiu Dickson, tikanga and law lecturer, who provided me with the research-guiding karakia (prayer) below.

Thanks too to my PhD friends at Te Piringa Faculty of Law’s Centre for Environmental, Energy and Resources Law, University of Waikato, especially Jagdeep and Ingrid. I am indebted to luminous law librarian Em Pooley and to Gillian O’Neill for sterling proofreading.

Closer to home, I acknowledge and thank the Kensington, Wright and Vazey families for their unwavering generosity, support and love. Finally, I acknowledge my parents, Elizabeth and Jonathan, and the little ones, Lulu, Vida, Oliver, Blake, Alec and Nate.

Ko Ranginui e tu nei
Ko Papatuanuku e takoto nei
Ko te nga Atua Māori ki waenga
E manaaki, e Tiaki i ahau.
Paimarire!

The Sky Father stands tall
and the Earth Mother reclines as the land
the Māori Gods are their children
They protect and guide me
Peace!

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List of Acronyms

ACE	Annual Catch Entitlement
AEE	Assessment of Environmental Effects
AGRC	Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves (2010)
CMA	Crown Minerals Act 1991
CRIRSCO	Committee for Mineral Reserves International Reporting Standards
EEZ	Exclusive Economic Zone
EPA	Environmental Protection Authority
FMA	Financial Markets Authority
FNZ	Fisheries New Zealand
HSS	Harvest Strategy Standard for New Zealand Fisheries
IEMRS	Integrated Electronic Monitoring and Reporting System
IMP	Information Management Protocol
ITQ	Individual Transferrable Quota
JORC	Australasian Code for Reporting and Exploration Results, Mineral Resources and Ore Reserves (2012)
MBIE	Ministry of Business, Innovation and Employment
MPI	Ministry for Primary Industries
MSY	Maximum Sustainable Yield
NEA	National Energy Authority (Iceland)
NZPAM	New Zealand Petroleum and Minerals
NZX	New Zealand Stock Exchange
PCE	Parliamentary Commissioner for the Environment
PMCSA	Prime Minister's Chief Science Advisor

PRP	Peer Review Panel
QMS	Quota Management System
RMA	Resource Management Act 1991
SMP	System Management Plan
SWG	Science Working Group
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
UNFC	United Nations Framework Classification for Fossil Energy and Minerals Reserves and Resources (2009)
VADE	Voluntary, Assist, Deter, Enforce

Glossary of Māori Words

Hapū	subtribe / kindship group
Iwi	tribe
Kaitiaki	guardian
Kaitiakitanga	guardianship
Kawanatanga	governance
Mana whakahaere totika	Māori governance jurisdiction
Mana whenua	ownership or association with land
Mātaitai	traditional food gathering area
Mātauranga	customary knowledge
Mauri	life force
Rangātiratanga	self-determination
Rāhui	restriction
Rohe	tribal area
Rohe moana	customary fishing area
Taiāpure	local fishery
Tangata whenua	in relation to a particular area, the iwi or hapū that holds *mana whenua* over that area
Taonga	treasure
Te Ao Māori	Māori world view
Tikanga	custom
Tino rangātiratanga	self-determination / absolute authority
Whakapapa	genealogy
Whanaungatanga	close connection
Wāhi tapu	sacred area

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CHAPTER ONE

INTRODUCTION

I Introduction

This thesis concerns natural resource development and legal requirements for information about resource management. It argues that natural resources law must reflect the key role of information requirements in natural resource management. In recent decades, wide-ranging economic and environmental reforms in New Zealand have seen the privatisation of natural resources and natural resource development operations. Law reform, resulting regulatory regimes and their subsequent bedding-in however show that New Zealand's resource management regimes have underlying problems[1] which are linked to the acquisition and management of natural resource information. The thesis argues that property-type holdings granted by the state for private development of natural resources should be adjusted to provide for changing societal values and multilateral interests in natural resource management. It argues that legal requirements for information about natural resource development play a vital role in making such adjustments and therefore that legal requirements for information must be given greater attention.

Statutory requirements for information in natural resource law are the fulcrum in managing natural resources. Where nationally owned natural resources are privately exploited, information requirements function to manage and regulate resource allocation and use. Legal requirements for information are usually directed at two principal parties: the resource owner—often the state—who manages a resource on the public's behalf via a government agency; or a resource developer—often a private company—that exploits a resource for private financial gain. Both parties have a duty to show how a particular resource is managed and exploited. A state agency is accountable to the executive branch of government and thereby to the public,

[1] For example, these include inter-agency coordination and silo-ing within agencies responsible for natural resource and environmental management; the problems associated with regional- and national-level divisions of responsibility; agency capacity and the challenges associated with the reduced role of the state. See Ministry for the Environment *New Directions for Resource Management in New Zealand* (June 2020); and Parliamentary Commissioner for the Environment *Focusing Aotearoa New Zealand's Environmental Reporting System* (November 2019).

while a developer is accountable to a state agency. Increasingly in New Zealand, accountability for private use of natural resources is also to Māori-owned entities. Where a natural resource is not actively exploited—for example for conservation reasons—a statutorily authorised agency may be required to account for its management or status through information requirements at some level. However, depending on the strength of broader resource management policy in such cases or for example the perceived economic value of a resource, such "required information", its reporting and its connection to wider resource management goals, varies widely.

Legislation partially addresses information challenges in natural resource management. For example, New Zealand's core resource management statute—the Resource Management Act 1991 (RMA)—has provisions about information-gathering, resource allocation and resource development monitoring.[2] Current law reform to replace the RMA with new statutes provides an important opportunity to improve information provisions that better provide for multilateral interests in resource management which are more strongly connected to national environmental monitoring and set wider resource management goals such as energy planning and biodiversity protection.[3] The Environmental Reporting Act 2015 also requires national-level reporting on the state of New Zealand's environment including authoritative information on the pressures on natural resources.[4] The most significant achievement from the first suite of reports under this Act was the acknowledgement that resource data for comprehensive and robust environmental reporting in New Zealand is "woefully uneven" and generally "chronically lacking"[5] due to both a scattered mosaic of legislative provisions for information about natural resource management and to New Zealand's broader environmental management system. The relationship between environmental reporting and legal requirements for information to

[2] RMA 1991 ss 35, 35A, 108 and sch 4.

[3] See Ministry for the Environment *Overview of the Resource Management Reforms* (January 2022); and *Natural and Built Environments Bill* (Consultation Draft, June 2021) at <www.environment.govt.nz>.

[4] See Ministry for the Environment *Environmental Management – The State of New Zealand's Environment* (1997) at [4.21] regarding the need to develop "better environmental information".

[5] Parliamentary Commissioner for the Environment *Focusing Aotearoa New Zealand's Environmental Reporting System* (November 2019) at 16; see also Parliamentary Commissioner for the Environment *The State of New Zealand's Environment: Commentary by the Parliamentary Commissioner for the Environment on 'Environment Aotearoa 2015'* (June 2016) at 9-25; and Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand: Key Messages* (February 2021) at 26-29.

manage individual and interrelated natural resources should be symbiotic and explicitly interlinked. Currently, it is not.[6]

New and changing demands on natural resources coupled with increased scientific and technical understanding about resources and their connection to wider ecological and environmental challenges is seeing significant shifts in how natural resource management is conceived, not least because of the imminent threats and effects of climate change. Prior to 2015, New Zealand was the only OECD country without regular national-level state-of-the-environment reporting.[7] Such reporting is part of the worldwide shift whereby the public increasingly expects transparent, evidence-based decision-making and publicly available scientific information and data upon which decisions are based. Democratic decision-making about natural resources and the recognition of Indigenous rights in natural resources are also increasing internationally. New Zealand's law and institutions must acknowledge and provide for this shift.[8] The potential costs in failing to do so include worsening environmental (including atmospheric) degradation and species extinction and accelerated resource scarcity. Especially where the long-term effects of climate change are unknown in many respects, law has a crucial role to play in devising equitable rules to protect the natural environment and the well-being of current and future generations.

In some respects, it is no surprise that current natural resource legislation contains few strategically linked provisions about resource information-gathering, given comprehensive national-level environmental reporting did not exist until 2015. Information requirements in natural resources law must work harder within individual statutory regimes and as part of a wider (inter)national level framework for resource and environmental management. Understanding the role of legal requirements for information in natural resources law is also vital to provide for Māori who are increasingly involved in natural resource management

[6] Ministry for the Environment *New Directions for Resource Management Law in New Zealand* (June 2020) at 382.

[7] Organisation for Economic Cooperation and Development *Environmental Performance Reviews: New Zealand 2017* (OECD Publishing, Paris, 2017).

[8] See Parliamentary Commissioner for the Environment *How Clean is New Zealand? Measuring and Reporting on the Health of our Environment* (April 2010); Parliamentary Commissioner for the Environment *Outcome Evaluation - Missing Links: Connecting Science with Environmental Policy* (June 2007); and Parliamentary Commissioner for the Environment *Missing Links: Connecting Science with Environmental Policy* (September 2004).

decision-making in Aotearoa New Zealand. Extending law to incorporate Indigenous-based solutions in natural resource management is key.[9]

To explore these issues, the research examines the legal requirements for resource information for managing three different natural resources under three separate legislative regimes:

- geothermal resources under the Resource Management Act 1991;
- ocean fisheries resources under the Fisheries Act 1996; and
- petroleum resources under the Crown Minerals Act 1991.

While these resources differ, their management in relative terms does not. They can all be regarded as subsurface, extractive industries which are exploited by (largely) privately owned companies. Geothermal and fisheries resources are nationally owned,[10] renewable resources which require sustainable management, while the nationally owned, non-renewable petroleum resource is exploited without sustainable-use considerations. Despite their broad similarities, the management of each resource reveals unique information challenges and insights. Understanding these can inform wider natural resource information challenges and thereby improve natural resource management both specifically under these regimes and more broadly in New Zealand.

Information challenges in managing large-scale (industrial) use of geothermal resources are largely invisible to the public. Generally, unlike the public attention attracted by mismanaged petroleum development (eg oil spills) or fisheries exploitation (fish stock collapse or fishing restrictions) the public is less aware of mismanaged industrial geothermal resource use. However, ineffective information requirements and/or poorly managed information about geothermal resource development can result in resource extraction which causes damage to

[9] See Ministry for the Environment *New Directions for Resource Management in New Zealand: Report of the Resource Management Review Panel* (June 2020) at 85-116; and Ministry of Business, Innovation and Employment, *National Science Challenges* at <www.mbie.govt.nz>, and *Sustainable Seas Ko nga Moana Whakauka* at <www.sustainableseaschallenge.co.nz>. See generally Justice Joseph Williams "Lex Aotearoa: An Heroic Attempt to Map the Māori Dimension in Modern New Zealand Law" (Harkness Henry Lecture) (2013) 21 Wai L Rev 1; and *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2021] NZSC 127 at [9] and [162] – [172].

[10] Note in addition to the state, Māori Iwi (tribes) also own fisheries and geothermal resources. The Waitangi Tribunal has also advised that outstanding legal issues remain in respect to Māori resource ownership and resource interests in fisheries (customary fisheries), geothermal, and petroleum resources and resource management (see further in chapter two). See generally Barry Barton "Energy and Natural Resources Law in New Zealand: An Eventful Forty Years" (2022) 40 JENRL 1, 9-16 at [2.1] and [4].

geothermal resources and their ability to provide renewable energy.[11] Damage to geothermal surface features and ecosystems and to overlying land (subsidence) and freshwater systems can also occur. Geothermal resources are highly valuable intrinsically and culturally and important nationally as part of New Zealand's renewable energy portfolio in providing stable base-load energy and a year-round energy source. Two elementary functions of information (and data) in managing geothermal resources relate to a regulatory agency having enough and suitable information (ie the relevant regional council which manages geothermal resources regionally under the RMA): first, to manage geothermal resources in the long term; and secondly, to manage and monitor the exploitation of individual geothermal systems by resource developers in the shorter term. Information challenges associated with each function differ and cross-reference. Long-term management requires information for decision-making for resource allocation for exploitation (or conservation), assessment of environmental effects and energy-strategy planning. Shorter-term management needs information to feed into longer-term management supplied under specific, legal rules for information that apply to resource developers. While the RMA through regional policy and rules has facilitated the development of legal requirements for information and data for geothermal resource management in considerable detail, the Act does not explicitly guide regional councils in resource allocation and long-term resource planning matters; nor has central government offered substantive guidance for geothermal resource management under the RMA since its enactment.[12]

Furthermore, there are two basic but often misunderstood premises of large-scale geothermal resource use. First, although the resource is categorised as a "renewable" energy source, its use is subject to unique requirements to ensure the resource's sustainable management. These requirements can make it easy for the public or non-experts to be unaware of geothermal development's "sustainability aspect", an unawareness which arguably can advantage both the geothermal development industry and a regional council (or central government) for different reasons. Secondly, the vast bulk of information and data a regional council relies on to manage large-scale exploitation of geothermal resources originates from resource developers before and during the granting of a resource-use permit. Such information and data are accumulated

[11] Katherine Luketina and Phoebe Parson "New Zealand's Public Participation in Geothermal Resource Development" in Adele Manzella, Agnes Allansdottir and Anna Pellizzone (eds) *Geothermal Energy and Society* (Springer Lecture Notes in Energy, Springer International Publishing, 2019) 193-296.

[12] Ministry for the Environment *National Policy Statement for Renewable Electricity Generation* (2011) mentions geothermal energy resources but does not provide guidance about how geothermal resources should be managed and developed.

during exploration and the ongoing development of a geothermal system under a use-permit often over decades and at considerable expense to a developer. The relevant information and data must be transferred to a regional council so that it can assess a permit application and resource-use compliance, once again allowing a regional council to learn about how to best manage the resource. The provision of this information and data to a regional council forms part of a company's social licence to exploit the resource—a resource for which no royalty charges are made for industrial-scale use.[13] However, because laypersons have little understanding of the importance of this information transfer or the sustainability considerations unique to geothermal exploitation, it is arguable that more publicly accessible information and data about geothermal resources and their industrial exploitation should be made available. Furthermore, the technical expertise to manage geothermal resources often sits outside a regional council with resource developers and parties contracted by a regional council or developer. Consequently, there is a distinct co-management aspect to geothermal resource management; hence, resource management policy and practice have evolved in different ways regionally. Regional differences can raise particular information challenges and legal questions relating for example to public access to natural resource information and regional council capacity issues.

The use of geothermal resources is expected to grow by 23 per cent by 2035 with the major expansion of New Zealand's electricity system displacing the use of fossil fuels.[14] However, individual geothermal systems categorised and used for large-scale development (using current technology) are near full capacity through both electricity generation and direct industrial uses; moreover, some geothermal systems are now exploited below their original capacity due to resource depletion over decades-long extraction. Although research to explore and develop the use of supercritical geothermal heat (ie found at a depth of around 4 km as distinct from typical extraction depths of 1.5–2 km) is currently being funded by central government,[15] many

[13] While RMA 1991 ss 112(2) and 369(3)(iv), and Resource Management (Transitional, Fees, Rents, and Royalties) Regulations 1991 cl 14 provide for the charging of royalties for geothermal resource use, royalties are not charged for industrial exploitation of the geothermal resource under the RMA 1991. See further Kevin Jenkins "Can I See Your Social Licence Please?" (2018) 14 Pol Quart 4, 27-35.

[14] Climate Change Commission *A Low Emissions Future for Aotearoa: Advice to the New Zealand Government on its First Three Emissions Budgets and Direction for its Emission Reduction Plan 2022-2025* (May 2021) at 89 and 113. See also Steve Rotheram "NZ Geothermal Association CEO Kennie Tsui" *Energy News* (New Zealand, 21 February 2022), regarding prediction for New Zealand geothermal generation's growth from 7600 GWh in 2020 to 12,000 GWh by 2030, an increase of 462 MW of generation capacity (net of de-ratings or decommissioning).

[15] Crown Research Institute GNS Sciences research project *Geothermal: Next Generation* was awarded approx. NZD 10 million in research funding in 2019 from the Ministry of Business, Innovation and Employment

unknowns (and risks) are associated with the use and development of "next generation" supercritical geothermal resources. Questions about who will bear these risks and how they will be borne remain. Legal review of the information challenges and lessons of the past 30 years under the RMA is therefore both valuable and timely in guiding the future management of geothermal resources in New Zealand's low-carbon energy future.

Information challenges in New Zealand's ocean fisheries management are long recognised, not least due to irreversible harms that may be caused through inadequately managed fisheries (eg collapsed fish stocks and habitat damage), poorly known environmental effects on related ecosystems or the effects of climate change. Yet successive governments make slow progress in comprehensively addressing or resolving fisheries information challenges either as they occur under the management framework of the Fisheries Act 1996 (Fisheries Act) or within a wider context of oceans management.[16] Misreporting and non-reporting of fisheries catch (including fish dumping, high-grading of fish and unreported landings) by commercial fishers is a chronic compliance problem with grave implications for fisheries sustainability.[17] While there are no accurate statistics for discarding and misreporting by commercial fishers, an overall conservative estimate since the current management regime was introduced is that only half the fish caught are officially reported. The economic theory that drove the privatisation of commercial fishing rights was intended to induce resource stewardship. However, perverse economic incentives and routinely contested science information are but two reasons permit-holder reporting has not occurred as expected. The Prime Minister's Chief Science Advisor's 2021 report, *The Future of Commercial Fishing in Aotearoa New Zealand*, acknowledges that a single, trusted source of information does not exist in the fisheries sector and that the inherent uncertainty in fisheries management can be easily manipulated to support various narratives,

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Endeavour Fund, see <www.mbie.govt.nz/assets/2019-endeavour-round-successful-projects.pdf>; see also <www.geothermalnextgeneration.com>. Note the New Zealand Geothermal Association is seeking a further NZD 50 million in government research and development funding in the next five years (from 2022), and a further NZD 100 million over ten years; Rotheram (2022), above n 14.

[16] Ministry for Primary Industries *The Future of Our Fisheries: Consultation Document* (Vol 1) (November 2016); Ministry for the Environment and Statistics New Zealand *Our Marine Environment 2019: New Zealand's Environmental Reporting Series* (October 2019); Parliamentary Commissioner for the Environment *Focusing Aotearoa New Zealand's Environmental Reporting System* (November 2019); and Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021). See further Greg Severinsen, Raewyn Peart, Bella Rollinson, Tracey Turner and Phoebe Parson *The Breaking Wave: Oceans Reform in Aotearoa New Zealand* (Environmental Defence Society, Auckland, 2022).

[17] Glenns Simmons and others *Reconstruction of Marine Fisheries Catches for New Zealand (1950 – 2010)* Working Paper Series, Working Paper 2015-87, Institute for the Oceans and Fisheries (University of British Columbia, 2016) at Abstract and [1.2].

with the very basis of fisheries management decisions in New Zealand often fiercely contested.[18]

Like geothermal resource management, the fishing industry itself is heavily involved in fisheries management and fisheries science information procurement used in decision-making. Further, the relationships between the commercial fishing industry, fisheries management, recreational fishers and other fisheries stakeholders are contentious and strained. The present research explores these features of fisheries management and their impacts on legal requirements for information and on information processes and information systems. It also explores legal information requirements and processes for customary Māori fishing as part of this relationship in order to examine the efficacy of "area management tools" under customary fisheries law.

Legal requirements for information play a crucial role in ensuring sustainable management of both geothermal and fisheries resources. Where information requirements for these resources are largely concerned with sustainable management of resources and managing environmental effects, legal provisions for information about petroleum resource development under the Crown Minerals Act 1991 (CMA) are focused on financial revenue accounting and resource forecasting. However, the specific functions of petroleum information requirements lend themselves to possible application for the improved management of renewable resources particularly regarding information holding periods by government agencies where commercially sensitive information and data (produced under resource permits) becomes publicly available after a limited time, and regarding securities law reporting requirements about resource estimates and ongoing risk disclosure relating to resource development. The CMA's legal rules for ongoing reporting about resource developer engagement with relevant Māori are also examined, with insights about their effectiveness in practice. As subsurface resources, geothermal resource "mining" and petroleum mining have many similarities especially in their "staged development", high upfront costs and investor risk management. In contrast to the thesis's analysis of the geothermal and fisheries resource management regimes, the petroleum management regime is examined from a procedural rather than substantive angle of analysis.

[18] Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021) at 2.

Overall, the research uses a natural resources law lens to examine and answer the research question. This lens, further explained in chapter two, also takes account of the wider spectrum of environmental, climate change and Indigenous rights law.

II Research Purpose and Objectives

The purpose of the thesis is to demonstrate the crucial role of legal requirements for information in natural resource management, particularly requirements for information within the resource owner and resource developer "regulatory relationship". By demonstrating information provisions' importance, the thesis shows how natural resources law and resource management can be improved through improving legal provisions for information and related information processes in the legislative and regulatory regimes that manage individual resources and in natural resources and environmental law broadly. Close examination of the law and regulation for geothermal, fisheries and petroleum resources is undertaken to answer the main research question:

- What legal characteristics are desirable in information requirements for managing natural resources?

From this question, more specific research questions emerge:

- What function/s do statutory information requirements serve in resource management and what legal issues are involved regarding these functions?
- How does privatisation of resource development affect information requirements?
- What natural resource information requirements are particular to Māori interests in and ownership and management of natural resources?
- How are information requirements interpreted through/affected by theories of regulation?
- Does environmental and official information law support existing and improved legal provisions for information in natural resource management in New Zealand?

The research objective is to provide examples of legal provisions for information in natural resources law, to examine their functions substantively and procedurally and to explore how institutional and sometimes political arrangements along with theories of regulation influence their application in practice. A further objective is to show the limitations of existing legal requirements for information and information processes (whether legally prescribed or informal) under each legal regime and to draw lessons for articulating optimum legal characteristics for information requirements in natural resources law for the future.

III Contribution to Knowledge

The research investigates legal requirements for information in three separate legal regimes by examining the legal dimensions of the role played by resource information in the relationship between resource owner and resource developer. Where natural resource law has historically had a narrow focus in facilitating resource development through bilateral decision-making about resource allocation and use (eg a resource owner and resource developer agreement), the present study explores opportunities and provides arguments for the provision of a wider range of interests in natural resource decision-making through optimising the role of legal requirements for information in natural resources law.

There is a dearth of resource-specific legal texts in New Zealand; nor are there resource-specific, stand-alone legal texts for ocean fisheries or geothermal resource management—two of New Zealand's valuable and unique natural resource taonga[19] (treasures). The legal regimes for individual natural resources are usually examined by chapter (or within chapters) in a natural resource and/or environmental law compendium.[20] While these provide valuable overviews and updates, they do not usually examine the application of regulation under a given resource's governing legislation. Likewise, while isolated attention may be given to individual resources in journals, attention typically focuses on statutory interpretation of environmental law principles (eg under case law) or on specific resource management incidents (threatened species or sustainability issues). Any discussion of or material on statutory information requirements of a given resource management regime also usually falls within a broader discussion of environmental, constitutional or administrative law rather than natural resource law.[21] For example, discussion about the interpretation of the precautionary principle or adaptive management raises legal issues about resource information (eg about information and data generation) but provides little in-depth legal analysis on either regulatory processes or the legal issues in information management processes.[22]

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[19] For fuller interpretation of te reo Māori (Māori language), including words listed in the thesis Glossary of Māori Words, see Richard Benton, Alex Frame and Meredith Paul (eds) *Te Mātāpunenga: A Compendium of References to the Concepts and Institutions of Māori Customary Law* (Victoria University Press, Wellington, 2013).

[20] See for example Michelle Van Kampen and Bal Matheson "Minerals and Petroleum" in Derek Nolan (ed) *Environmental and Resource Management Law* (5th ed, LexisNexis, 2015).

[21] See for example Trevor Daya-Winterbottom "The Role of Administrative Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (2nd ed, Thomson Reuters, 2018) at [6.3.2] – [6.5].

[22] An exception to this is Hilke Giles and Barry Barton "Adaptive Management under the RMA: The Tension between Finality and Flexibility" (2020) 24 NZJEL 1.

Perhaps most significantly, no thorough legal analysis of law, policy and regulation for geothermal resource management has been undertaken in recent decades despite substantial advances in large-scale resource exploitation and in regional policy and rule development under the RMA. In part, this sparsity of legal analysis may be because industrial development of geothermal resources occurs in only three of New Zealand's sixteen regions, and contributes less than 20 per cent of renewable electricity to New Zealand's already highly renewable energy portfolio. Boast and Bennion provide detailed legal history of geothermal resources law, both in the capacity of supporting enquiries into Treaty of Waitangi Te Tiriti o Waitangi 1840[23] (Te Tiriti o Waitangi or Te Tiriti) claims concerning geothermal resources [24] and independently.[25] However, their review of geothermal resources law stops short of the legal developments under the RMA in recent decades. So too does Fisher's work[26] on natural resource and energy law and Kan's research on information flows in natural resource management,[27] both before the RMA's enactment. More recently, Schofield provides a legal overview of geothermal resource ownership and development issues through a comprehensive analysis of geothermal case law (focused on the *McLauchlan* cases particularly) in the context of climate change mitigation research.[28] However, although Schofield pays close attention to the adverse environmental effects of geothermal exploitation, he does not analyse resource sustainability as it applies uniquely to geothermal resource extraction-rates or methods; nor does his work review regional policy or rules for geothermal resource management under the RMA.[29] Both Barton and Grinlinton have reviewed the use of geothermal resources in the

[23] See Treaty of Waitangi Act 1975 sch 1 for Māori and English language texts of Te Tiriti.

[24] See for example Richard Boast *The Legal Framework for Geothermal Resources: A Historical Study* (report to the Waitangi Tribunal, 1991); and Tom Bennion *New Zealand Law and the Geothermal Resource* (report to the Waitangi Tribunal, 1991). Regarding geothermal resource law pre-RMA, see Simon Upton "The Law relating to Geothermal Energy in New Zealand" (LLB (Hons) Dissertation, University of Auckland, 1983).

[25] RP Boast "Geothermal Resources in New Zealand: A Legal History" (1995) 6 Canta LR 1; and DA Edmunds and RP Boast "Geothermal Resources and the Law" (from proceedings New Zealand Geothermal Workshop, 1991).

[26] Douglas E Fisher "Natural Resource Development and the Planning Process: A Series of Papers" (from proceedings Energy and Natural Resources Law Association, 1986); and Douglas E Fisher (ed) "Resource Use Resolving the Conflicts: Present and Proposed Policies and Legal Mechanisms for Resource Use in New Zealand" (from proceedings Energy and Natural Resources Law Association, 1986).

[27] Raybon Kan *Confidentiality and Abuse of Discretion: Legal Aspects of the Information Flow Between Government and Private Sector in New Zealand's Petroleum Industry* (prepared for the Energy and Natural Resources Law Association of New Zealand Inc, 1989).

[28] Simon Anthony Schofield "The Law of Climate Change Mitigation in New Zealand" (Master of Laws Thesis, University of Canterbury, 2012) chapter six, part four. For example, *McLachlan v Mercury Geotherm Ltd (in receivership)* CA 117/05 (4 December 2006).

[29] Simon Schofield "Geothermal and Wind Energy in New Zealand" (2013) 155 NZJEL 17. The author focuses his sustainability assessment on the first-in-first-served system of resource allocation under the RMA. Note similar

context of energy developments in New Zealand;[30] Barton also reviewed the law concerning legal rights to minerals in geothermal fluid in industrial-scale resource extraction.[31] Waikato and Bay of Plenty Regional Council's policy and science staff (particularly in their membership roles with the New Zealand Geothermal Association and the International Geothermal Association) produce a number of conference and workshop papers which review and explain geothermal policy and rule development under the RMA.[32] However, such reviews do not comprise independent legal analysis. Preceding the RMA, geographer, Evelyn Stokes, wrote about (and was involved in) a central government geothermal resource development process covering much of the legal process under the Public Works Act 1928 and Geothermal Energy Act 1953.[33] Van Campen produced a number of technical papers, and in 2022 a doctoral dissertation, reviewing aspects of New Zealand law and regulation for geothermal resources, including comparisons with overseas jurisdictions, from a non-legal disciplinary background.[34] Malafeh and Sharp researched the role of royalties in geothermal resource development.[35] Māori academics write on Māori geothermal resource development from tikanga Māori (Māori

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comment may be made of the comprehensive overview of law and policy relevant to geothermal resource development in D Kissick, M Climo and B Carey *An Overview of New Zealand's Geothermal Planning and Regulatory Framework* (report produced for *Geothermal: The New Generation*, by Traverse Environmental Ltd, August 2021).

[30] Kenneth Palmer and David Grinlinton "Developments in Renewable Energy Law and Policy in New Zealand" (2014) 32 JENRL 3, 245-272; and Barry Barton "From Public Service to Market Commodity: Electricity and Gas Law in New Zealand" (1998) 16 JENRL 351-388. See also Barton (2022), above n 10.

[31] Barry Barton *Legal Rights to Minerals in Geothermal Fluids* (research report at the Centre for Environmental, Resources and Energy Law, Te Piringa – Faculty of Law, University of Waikato, 2015).

[32] See for example, Blair N Dickie and Katherine M Luketina "Sustainable Management of Geothermal Resources in the Waikato Region, New Zealand" (paper from proceedings World Geothermal Congress, Turkey, April 2005); Katherine Luketina and Blair Dickie "Waikato Regional Council Geothermal Policy: On the Home Straight" (paper from proceedings New Zealand Geothermal Workshop, November 2006); Katherine Luketina "Sustainability and the Democratic Process" (paper from proceedings World Geothermal Congress, Indonesia, April 2010); and Penny Doorman and Jim McLeod "The Changing Face of Geothermal System Management Plans in New Zealand" (paper from proceedings New Zealand Geothermal Workshop, November 2018).

[33] Evelyn Stokes *Ohaaki: A Power Station on Māori Land* (Te Matahauariki Institute, University of Waikato, 2004); see also, Evelyn Stokes *The Legacy of Ngatoroirangi: Māori Customary Use of Geothermal Resources* (Department of Geography, University of Waikato, 2000).

[34] For example Bart Van Campen "Comparison of Geothermal Regulation between Chile, Philippines and New Zealand" (paper from proceedings World Geothermal Conference, Australia, April 2015,); Bart Van Campen and Kavita Rai "Geothermal Policy and Regulation: Cases from Chile, Kenya, New Zealand and the Philippines" (IRENA and Geothermal Institute, University of Auckland, June 2015); and Bart Van Campen "The Use of Geothermal Reservoir Modelling and Resource Assessment in Geothermal Regulation and Sustainable Resource Management" (Doctoral Dissertation, University of Auckland, 2022).

[35] Sam Malafeh and Basil Sharp "Role of Royalties in Sustainable Geothermal Energy Development" (2015) 85 Energy Policy 235-242. See also Sam Malafeh "Economic Development of Geothermal Resources: Property Rights and Policy" (Doctoral Dissertation (economics), University of Auckland, 2013).

custom) perspectives and from non-law disciplines.[36] The current research seeks to explore, and fill, gaps in the natural resources law literature on geothermal resource management. In doing so, the geothermal resource is the research's main resource studied.

Attempts to manage fisheries information challenges in recent years have resulted in a variety of policy and regulatory measures and voluminous case law. While these have generated scholarly debate—with much attention given to economic theory—less systematic attention has been given to compare fisheries information requirements with those of other natural resource regimes, or the use of theories of regulation in managing fisheries or to Indigenous applications of regulation.[37]

The research emphasises the role of regulation and how it bears directly on information requirements and information management processes. While government policy reflects international efforts to produce *Better Regulation* (OECD) and government agencies are tasked with reviewing regulation and producing regulation standards, review is broadly focused.[38] For example, there is no systematic review of how particular theories of regulation function to manage natural resources. The current research therefore systematically applies regulation theory to analyse the efficacy of legal information provisions for geothermal, fisheries and petroleum resources. Economic anthropology and macro-level discourse analysis—disciplinary areas which enrich applications of regulation analysis and which are under-explored in law—are also explored in this context particularly for customary fisheries management.

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[36] See DCH Hikuroa, TKKB Morgan, M Henare, and DM Gravley "Integrating Indigenous Values into Geothermal Development" (2010) 34 Transactions – Geothermal Resources Council 51-54; S Heremaia "Māori Ownership of Geothermal Resources and the Resource Management Act 1991: The Rotoma Geothermal Field" (1995) 1 NZELR 5 109; A Tunks "Kaitiakitanga – The Ngawha Geothermal Resources" (1994) 1 94) NZELR 84; T Tutua-Nathan "Maori Tribal Rights to Ownership and Control: the Geothermal Resource in New Zealand" (Department of Geography, University of Auckland, 1992); Maria Bargh "Rethinking and Re-shaping Indigenous Economies: Māori geothermal Energy Enterprises" (2012) 6 Journal of Enterprising Communities: People and Places in the Global Economy 3 at 271-283; Dylan Tuate, Kepa Morgan, Jason Ingham, Rosalind Archer and Tūmanako Fa'aui "An Holistic Approach to Impact Assessment: Revitalising the Presence of Māori Values for Cultural Sustainability in Geothermal Development" (paper from proceedings New Zealand Geothermal Workshop, 2019); and Nona Taute "Integrating Mātauranga Maori in Geothermal Development" (Doctoral Dissertation, Department of Civil and Environmental Engineering, University of Auckland, forthcoming 2023).

[37] Research to explore an Indigenous lens to inshore fisheries and ecosystems management is currently being undertaken under the National Science Challenge *Sustainable Seas*; see Ministry of Business, Innovation and Employment, *National Science Challenges* at <www.mbie.govt.nz>; and *Sustainable Seas Ko nga Moana Whakauka* at <www.sustainableseaschallenge.co.nz>.

[38] See Treasury *Government Expectations for Good Regulatory Practice* (April 2017); Productivity Commission *Regulatory Institutions and Practices* (June 2014); and OECD Regulatory Policy at <www.oecd.org/regulatory-policy/>.

Literature on the legal dimensions of delegated resource management in New Zealand such as the use of a third-party peer review to monitor resource permit conditions is scarce.[39] Nonetheless, delegated resource management considerations are relevant to the research because technical expertise to manage resource exploitation is not always found amongst government agency staff. While governing statutes may allow for delegation, statutes can be silent about the terms of technical, expert engagement. For example, under the RMA, although the Act provides for delegation and states that delegates cannot make final decisions on resource permit compliance matters, the Act is silent about whether such experts should belong to a recognised professional body or whether they need to publicly list conflicts of interest. This silence can translate to a lack of clarity in policy development and can lead to legal issues about compliance quality and rule enforcement.

The research explores delegation to third parties with reference to adaptive management especially for geothermal resources and in fisheries resource management where informal (non-legal) standards for science research have been developed. Compared to the geothermal development or fisheries industries, the international petroleum industry has a longer history of standardising legal rules and criteria for third-party assessments of resource exploration and development. Such criteria are closely linked to revenue accounting and to economic risk assessment and risk disclosure. Despite significant securities offerings by publicly listed geothermal resource development companies in New Zealand, no formal standards or criteria apply to environmental or economic risk assessment for geothermal resource development either for initial offerings (public stock exchange) or under ongoing disclosure obligations (securities law). The research therefore examines the relevance of the *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves*[40] under the CMA, its adaptation for geothermal resource assessment and reporting in the *Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves*[41] and the *United Nations Framework Classification Specifications for Geothermal Resources*.[42]

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[39] Giles and Barton (2020) above n 22.

[40] *Australasian Code for Reporting of Exploration Results, Minerals Resources, and Ore Reserves* (*JORC Code*) (12th ed, 2012) at <www.jorc.org/docs/JORC_code_2012.pdf>

[41] *Australian Code for Reporting of Exploration Results, Geothermal Resources, and Geothermal Reserves: The Geothermal Reporting Code* (*AGRC*) (2nd ed, 2010) at <www.dmp.wa.gov.au/Documents/Geological-Survey/Geothermal_Reporting_Code_Ed_2.pdf >

[42] United Nations Economic Council for Europe, United Nations Framework Classification for Resources, *Specifications for the application of the United Nations Framework Classification for Fossil Energy and Mineral*

Government policy and government-funded research regarding natural resource and environmental management are also increasingly acknowledging the value and importance of Māori knowledge— mātauranga Māori.[43] Current law reform for natural resource management gives particular attention to Māori knowledge and information systems and thereby to the constitutional role of Māori in resource management.[44] The research therefore analyses existing legal information provisions and processes and how they provide for Māori and mātauranga Māori in natural resource management.

The research topic is significant overall because increasing demands on natural resources mean accountable decision-making is increasingly expected. Resource information exists in a decision-making setting pressured by multiple interests. Justifiable and defensible reasons for decisions are vital not only for long-term sustainable resource management but human survival and flourishing. While economic justifications for resource development remain relevant, natural resources must increasingly be managed equitably in a way that benefits multiple interests and multiple and new environmental challenges. The issues addressed in this thesis have rightly been attracting government attention in recent years, if not in terms of legal analysis. For example, such attention has focused on natural resource stock-taking, environmental reporting, the critical role of science and environmental research and the robustness of research processes and information and data-repositories and systems in New Zealand.[45]

Reserves and Resources 2009 (UNFC-2009) to Geothermal Energy Resources (Geneva, 30 September 2016) at <www.unece.org/sustainable-energy/unfc-and-sustainable-resource-management/unfc-and-geothermal-energy>.

[43] See for example Ministry of Business, Employment and Innovation *Vision Mātauranga: Unlocking the Innovation Potential of Maori Knowledge, Resources and People* (July 2007); and Ministry of Business, Employment and Innovation, National Science Challenge, *Sustainable Seas* "Vision Mātauranga" at <www.sustainableseaschallenge.co.nz>. For an overview and explanation of mātauranga Māori, see Daniel Hikuroa "Mātauranga Māori—the ūkaipō of Knowledge in New Zealand" (2017) 47 Journal of the Royal Society of New Zealand 1, 5-10.

[44] See for example Cabinet Paper "Oceans and Fisheries Portfolio - Ensuring Healthy Ocean Ecosystems" (2 July 2021) at [9.24], [20], [40], [42.4], [53.3], [59] and [61 (9.2.4)]; and Ministry for the Environment *Natural and Built Environments Bill: Parliamentary Paper on the Exposure Draft* (June 2021) at 9.

[45] See for example Ministry for the Environment and Department of Conservation *Conservation and Environmental Science Roadmap: Discussion Paper* (July 2016); Office of the Prime Minister's Chief Science Advisor *Enhancing Evidence-based Policy Making* (July 2017); Ministry for Primary Industries *Draft Research, Science and Innovation Strategy* (November 2019); and Parliamentary Commissioner for the Environment *A Review of Funding and Prioritisation of Environmental Research in New Zealand* (December 2020); Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021).

IV Research Methodology

The study is an empirical legal enquiry applying conventional legal research in context. Primary material in legislation, regulation and case law is used to explore the law and its interpretation using recognised statutory interpretation methods.[46] Statutory interpretation provides insights into the application of statutory principles and information-relevant legislative provisions. Case law brings into focus tensions in policy development and within regulatory and stakeholder relationships and highlights substantive and procedural legal issues surrounding information processes and management. Secondary material in standardised legal textbooks, journal articles, conference papers and government reports and policy documents are used to deepen understanding of the issues.

Because law is a type of social science[47], legislative histories and policy development are also reviewed to examine ideological underpinnings of New Zealand's resource management law—particularly neoliberalism's influence. Empirical enquiry is explored using theories of regulation[48] to analyse conventional and decentred regulation in practice.[49] As the research's main resource studied, further empirical enquiry to explore the application of regulation to manage the geothermal resource was used through a series of informal interviews, attendances at national and international policy workshops and geothermal industry-related conferences, site visits at geothermal power plants and numerous discussions with geothermal experts in policy and regulation development, science and engineering.[50]

For comparison purposes, the geothermal resource management law of Iceland adds useful context to aspects of New Zealand's geothermal resource law, although not as a formal, comparative law analysis; comparative analysis with other jurisdictions' law is not extended to fisheries and petroleum resources in the thesis.[51] Further, due to the unavailability in English of some primary materials for Iceland secondary materials such as academic commentary are used. After Iceland, New Zealand has the second-highest installed geothermal energy profile

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[46] Ross Carter *Burrows and Carter Statute Law in New Zealand* (6th ed, LexisNexis, 2021).

[47] P Ishwara Bhat *Idea and Methods of Legal Research* (Oxford University Press, 2020) at 121-122.

[48] See generally Robert Baldwin, Martin Cave and Martin Lodge *The Oxford Handbook of Regulation* (Oxford University Press, 2013).

[49] Julia Black "Decentring Regulation: Understanding the Role of Regulation and Self-Regulation in a 'Post-Regulatory World'" (2001) 54 Current Legal Problems 102.

[50] John Baldwin and Gwynn Davis "Empirical Research in Law" in Mark Tushnet and Peter Crane (eds) *The Oxford Handbook of Legal Studies* (Oxford University Press, 2005) at 880-881.

[51] Konrad Zweigert and Hein Kotz *An Introduction to Comparative Law* (3rd ed, Oxford University Press, 1998).

per capita in the world—one of the largest geothermal industries worldwide and is seen as a leader internationally in: regulatory management at local government level (law, policy and rules); technical expertise, and industry-specialists who are often contracted to work on geothermal development projects internationally. As the region with approximately 90 per cent of high-temperature geothermal resource use, the Waikato Regional Council has been conspicuous in leading policy and rule development to manage industrial-scale geothermal resource use under the RMA. Research to explore and clarify legal questions about resource management therefore has the potential to enhance both local and international best practice management.

In seeking to understand the issues involved in geothermal resource management, research into the legislative regimes of other natural resources became an obvious way to compare and better appreciate the role of legal provisions for information in natural resource law. Fisheries and petroleum resources were chosen based on both their (commonly defined) qualification as nationally owned natural resources that are privately exploited and on the explicit information principles and information-related provisions of their statutory regimes. Due in large part to their individual resource characteristics, fisheries and petroleum resources attract legal academic interest differently. These differences manifest in how the thesis has apportioned the treatment of fisheries and petroleum resources. As the thesis's main resource studied, the geothermal resource is covered in three initial chapters, while fisheries and petroleum resources are allocated one chapter each, consecutively, after the geothermal resource chapters. The fisheries chapter is considerably larger than the petroleum chapter both because it accounts for commercial, recreational, and customary fisheries users, and because it examines scientific and environmental factors. Accordingly, the thesis does not give equal treatment to each resource, but seeks to draw useful insights from each resource, while apportioning the lion's share to geothermal resource management and while comprehensively answering the research question.

Aotearoa New Zealand's bicultural context includes the increasing role of Indigenous entities as resource owner and sometimes also as resource developer. A substantive examination of information provisions in natural resources law in Aotearoa New Zealand must include Māori rights and interests in natural resources and resource management. Consequently, legal requirements for resource information is relevant to Māori ownership as well as to Crown (or public) resource ownership. Examination of each resource in the thesis therefore includes appraisal of the law's inclusion and treatment of information requirements specific to Māori in managing each resource. Further, whereas conventional legal research usually starts with

primary legislation and an explanation of legislative provisions, this research foregrounds conventional legal analysis about each resource (geothermal, fisheries and petroleum resources) by referring to Māori values and history concerning the resource in order to support the inclusion of Indigenous knowledge and views with the aim of encouraging critical reflection of conventional approaches to resource management law which may perpetuate a status quo detrimental to Māori.[52]

V Thesis Pathway by Chapter

The next chapter develops natural resources law as the lens through which the research questions are examined. Key terms and concepts relevant to the research such as theory and principles underpinning New Zealand's natural resources law are explained. The constitutional relationship between Māori and the Crown is positioned in the research. Chapter two also identifies political and historical events influencing the development of New Zealand's law. The role of regulation and theories of regulation are explained. The constituent parts of "resource information" such as different types of information and differences between information, data and knowledge are clarified. The concepts and terms in chapter two provide context for understanding the research questions and show within what framework the research question is answered.

As the thesis's most substantially studied resource, the geothermal resource is examined in chapters three, four and five. Chapter three explains geothermal resource properties and the electricity generation sequence and provides a summary of geothermal resource law under the RMA including the resource-permitting process. Furthermore, RMA principles are introduced which feed into the legal provisions examined. Starting with sustainable management and Te Tiriti principles, the precautionary principle, adaptive management and the use of management plans are explained in the geothermal resource management context. The RMA's core "information provisions" ss 35, 35A, 108 and sch 4 are positioned functionally as driving the legal requirements for information in managing geothermal resource development under regional policy and rules. Case law clarifies the interpretation of ss 35 and 35A.

Chapter four examines regional policy and rules and regulatory processes and tools requiring or affecting information and data provision. Regional differences in policy and rules—

[52] This is one of three Kaupapa Māori research methodological approaches used in Maria Bargh and Estair Van Wagner "Participation as exclusion: Māori engagement with the Crown Minerals Act 1991 Block Offer process" (2019) 10 Journal of Human Rights and the Environment 1, 118-139 at 120.

especially those concerning the different emphases on sustainable use of geothermal resources—are noted and discussed. A Table (Table 4.1) compares how each region's policy and plan rules provide for industrial-scale geothermal resource management. As peer review panels are mandatory to manage geothermal resource permits, the geothermal peer review panel process and its history in geothermal resource management in New Zealand are explained. Both peer review and the use of technical modelling in geothermal resource management are scrutinised. As another geothermal-rich country with significant industrial-scale use of geothermal resources, here Iceland provides a useful comparison in its legal provisions for information about resource development.

Chapter five deepens the substantive and procedural analysis of geothermal resource law by applying regulatory theory to the geothermal resource rules and regulatory practices explored in chapter four. Critical reflection on geothermal resource co-management by regional council and permit holder, and co-management's effect on the development and application of legal provisions for information is offered.

Chapters six turns to fisheries management. It compares and draws insights from the information principles, legal provisions for information and information processes in fisheries law. An overview of privatised rights in commercial fishing under the Fisheries Act and Te Tiriti Settlement legislation is provided. Case law interpretation of fisheries law information (and environmental) principles shows the central importance of information provisions in fisheries management and the multiple interests in fisheries resources. Legal provisions for information for customary, recreational and commercial fishers are reviewed. Informal standards for the use of peer review in fisheries management are assessed and compared with the geothermal resource management peer review. As with the geothermal resource, the chapter also applies regulation theory to deepen its substantive and procedural analysis. It applies and builds on the theory of regulation used to analyse geothermal resource management in the previous chapter by discussing the usefulness of discourse analysis within regulation analysis. Regulation analysis in chapter six focuses on commercial fisheries compliance and the efficacy of information provisions for customary fisheries users. Because the various components of fisheries information management in chapter six do not lend themselves well to tabulation, components of fisheries management are summarised and tabulated under themes in the final chapter, eight.

The last “resource chapter”—chapter seven—investigates petroleum development under the CMA. It explains the Act’s information provisions and the resource-permitting process, “good industry practice”, and limited protection for commercially sensitive information. Regulation analysis takes a lesser role than in the geothermal and fisheries management chapters and focuses on information requirements for petroleum resource developers’ ongoing engagement with relevant Māori. The later half of the chapter discusses whether geothermal resource management can learn from petroleum management, particularly in relation to information disclosure and public access to information, and whether securities law disclosure obligations and internationally accepted standards for petroleum resource management should apply to geothermal resource management in New Zealand. A Table (7.1) in this chapter shows the stark difference between legslative information provisions for petroleum and geothermal resource management.

Finally, chapter eight synthesises the research with insights from the core chapters via a comprehensive, multi-page Table (8.1) comparing information-related elements under the three resource management regimes explored. Drawing on themes identified in the Table, the research question is answered by discussing ideal legal characteristics for legal information provisions to manage natural resources.

CHAPTER TWO

A FRAMEWORK FOR NATURAL RESOURCES LAW RESEARCH

I Introduction

Natural resources law provides the lens through which this thesis examines the research question:

- What legal characteristics are desirable in information requirements for managing natural resources?

To identify legal theory and principles underpinning natural resources law, this chapter adopts a natural resources law lens to focus on the property holdings and/or property-like holdings of parties with legal interests in natural resources. Tensions in natural resource management arise due to competing interests in natural resources and clashes in values regarding natural resource management such as economic or private values in tensions with environmental or public values. Adopting a natural resource law lens helps identify the fundamental role that statutory requirement for information plays in facilitating the needs of competing interests in natural resources. Natural resources law "gets at land use" much more directly than environmental law does[1] and is often concerned with the exploitation of publicly owned resources. Issues related to access and development of publicly owned resources therefore remain central to the distinction between natural resources law and environmental law.[2] Natural resources law is concerned with the upstream rather than downstream use of resources and focuses on extraction and primary production—"the stuff of consumption". Historically, natural resources law is not concerned with *how* resources are captured or used or with the methods of their disposal; these are usually the domain of tort law or environmental law.

The chapter is in five parts. In laying the legal and theoretical framework for the research, part two provides an overview of natural resource law to emphasise the importance of conceptual

[1] Robert L Fischman "What is Natural Resources Law" (2007) 78 U. Colo. Law Rev. 717-750 at 734.

[2] At 719. See also DE Fisher *Natural Resources Law in Australia* (The Law Book Company Ltd, Sydney, 1987) at 3-6. See further *Donoghue v Stevenson* [1932] AC 562 (HL); and *Rylands v Fletcher* (1868) LR 3 HL 330.

underpinnings and definitions for natural resources and how these translate into legal theory and principles. Thirdly, New Zealand's political and ideological influences impacting natural resource law and the constitutional relationship between the Crown and Māori as a central component of natural resources law in Aotearoa New Zealand are outlined. Property's function in natural resources is addressed because ownership and property interests influence the terms of natural resource decision-making. Part four explains the relevance of theories of regulation because the thesis closely examines the regulation, regulatory practices and regulatory relationships for the management of geothermal, fisheries and petroleum resources. Part five overviews the kinds of information required in natural resource management, why it is required and of whom in order to introduce the reader to the breadth and complexity of legal provisions for information and their accompanying *legal* and *management* challenges.

II Natural Resources and Theoretical Concepts

In Western thinking, natural resources encompass in-situ raw resources ie minerals, forests or fugacious raw materials, such as petroleum, fisheries and water. Subcategories of natural resources can include surface, subsurface, renewable and non-renewable resources.[3] The value given to natural resources is generally determined by their utility in meeting human need. The reason for their development is usually economic.[4] However, it is important to acknowledge that the term "natural resources" is inherently value-laden and that values translate into and are perpetuated through law.[5] How one conceives of, values, and defines "nature" or "resources" impacts one's relationship with the natural world. Justifications for interaction with (or exploitation/non-exploitation of) nature and resources flow from these conceptions. While such conceptual thinking can seem far removed from everyday, useful problem-solving, it is important to remember that conceptions translate into accepted behaviour and norms.[6] Therefore, while this thesis is primarily a pragmatic examination of natural resource law and

[3] James Rasband, James Salzman, Mark Squillace *Natural Resources Law and Policy* (Foundation Press, New York, 2004) at 36.

[4] Jan G Laitos, Sandi B Zellmer and Mary C Wood *Natural Resources Law* (2nd ed, American Casebook Series, Thomson Reuters, 2012) at 4-47.

[5] Arlon R Tussing "An Economic Overview of Resource Disposition Systems" in Nigel Bankes and J Owen Saunders (eds) *Public Disposition of Natural Resources* (Canadian Institute of Resources Law, University of Calgary, 1984) at 19. See further Estair Van Wagner "Placing Natural Resources Law: Preliminary Thoughts on Decolonizing Teaching and Learning about People, Places, and Law" in Amanda Kennedy and others *Teaching and Learning in Environmental Law: Pedagogy, Methodology and Best Practice* (Edward Elgar Publishing, 2021).

[6] HLA Hart *The Concept of Law* (Oxford University Press, New York, 1990); and Klaus Bosslemann "Sustainability Alternatives: A Germany-New Zealand Perspective" (2015) 13 NZJPIL 25 at 27.

its function in managing natural resources, it assumes three broad theoretical concepts influence natural resource law in New Zealand.

The first is the primarily exploitative conception[7] of natural resources as portrayed in traditional natural resources law which serves the basic function as the central justification for resource exploitation.[8] As society's values change so might justifications for utilitarian actions. For example, historically, economic justifications for development have been made (and may yet be made) at the cost of environmental and other social values. However, it is possible to consider traditional economic theory taking a lesser role under a revised model.[9] Perceptions of resources—and legal structures—vary over time and thus are a product of a configuration of political issues of the day mixed with more long-term shifts in ideological attitudes.[10]

The second is the te ao Māori (the Māori worldview) concept of natural resources and its central importance to natural resource management in Aotearoa New Zealand. The Māori perception of the environment and attitude to natural resources is governed by Māori cosmology.[11] Through whakapapa (genealogy), this explains the relationships and whanaungatanga (close connection) between gods, the natural world and human beings.[12] Mātauranga Māori spans Māori knowledge, culture, values and worldview.[13] Māori developed practices to preserve the mauri (life force) of natural resources to ensure sustainable management. Resources are protected by kaitiaki (guardians) who mediate relationships between people and resources to maintain the resources' mauri.[14] Māori property rights in resources are established and

[7] John Stewart Mill described utilitarianism as that which seeks to provide the greatest good for the greatest number of people; a rights-based view of the world insofar as decisions ought to be made on the basis of social welfare as measured for humans. If a strongly economic approach is taken under a utilitarian justification, for example, environmental or intrinsic values might be discarded. Therefore, while utilitarianism may not necessarily be objectionable in itself, values which drive its application can be. See Joseph Persky *The Political Economy of Progress: John Stuart Mill and Modern Radicalism* (Oxford University Press, 2016) at 26.

[8] Fischman (2007), above n 1, at 731 and 733.

[9] See Kate Raworth *Doughnut Economics: Seven Ways to Think Like a 21st Century Economist* (Random House, London, 2017).

[10] RP Boast "Geothermal Resources Law in New Zealand: A Legal History" (1995) 6 Canta LR 1-24.

[11] See further Urlich Klein "Belief Views on Nature – Western Environmental Ethics and Māori World Views" (2000) 4 NZJEL 81.

[12] Hirino Moko Mead *Tikanga Māori: Living by Māori Values* (Hui Publishers, Wellington, 2003) at 42-43.

[13] Daniel Hikuroa "Mātauranga Māori—the ūkaipō of knowledge in New Zealand" (2017) 47 Journal of the Royal Society of New Zealand (1) 5-10 at 5. See further, Hirini Moko Mead *Tikanga Maori: Living by Maori Values* (New York: Huia NZ Ltd, 2013). See also for example, Maui Hudson and Others "Visualising Mātauranga Māori for Iwi Outcomes" (2020) 76 New Zealand Science Rev (Special Issue, Mātauranga Māori, Part 2) at 40-48.

[14] Māori Marsden "The Natural World and Natural Resources" in Charles Royal (ed) *The Woven Universe: Selected Writings of Rev Māori Marsden"* (Estate of Rev. Māori Marsden, Masterton, 2003) at 24-54

maintained through both te ao Māori and tikanga Māori (Māori custom).[15] Particularly since the establishment of the Waitangi Tribunal and the Tribunal's enquiries into, and legal redress recommendations for, Te Tiriti breaches, subsequent statute and case law in Aotearoa has increasingly incorporated and provided for Maori rights, interests and worldview.[16]

The third conception which can largely be described as environmentalism encompasses shifting conceptions of natural resource management in response to contemporary local and global challenges such as environmental degradation, resource scarcity, climate change and increasing public awareness about the wider impact of natural resource exploitation on ecosystems and the broader environment. This concept arguably serves the needs of all parties with interests not only in natural resources but also in the wider nation/state by constraining the negative effects of a traditional, economics-driven utilitarian approach to natural resource exploitation.

Although the latter of these two concepts is increasingly provided for in natural resource law in New Zealand, this thesis suggests natural resources law (as distinct from environmental law) should further evolve to incorporate the legal interests of parties arising under these concepts. Stronger utilisation of statutory and regulatory information requirements in natural resources law and understanding how information requirements may be linked to wider, interconnected aspirations in natural resources management is the focus of this thesis.

A Natural Resources Law

Western societies have typically placed humans in an anthropocentric relationship with the natural world.[17] Accordingly, the history of natural resources law has often been one of strongly embedded individual rights to natural resources exercisable and defensible as proprietary rights.[18] In this tradition, natural resources law developed as a subset of property law and the ownership of resources associated with it. The granting of rights to resources lies

[15] Various legal doctrines support this; foremostly, the doctrine of Aboriginal title formally expressed in Te Tiriti o Waitangi, Treaty of Waitangi (1840). This legal doctrine recognises the continuity of tribal rights after colonisation, unless such rights are extinguished by statute, purchase, or voluntary cession. See further, Morag McDowell and Duncan Webb *The New Zealand Legal System Structures and Processes* (4th ed, LexisNexis, Wellington, 2006) at 195.

[16] Waitangi Tribunal Act 1975; see also *Takamore v Clarke* [2012] NZSC 16, [2013] 2 NZLR 733; and *Re Edwards (Te Whakatohea (No 2))* [2021] NZHC 1025.

[17] Rasband, Salzman and Squillance, above n 3, at 16. See also Y King "Toward an Ecological Feminism and a Feminist Ecology" in JS Dryzek and D Scholsberg (eds) *Debating the Earth: The Environmental Politics Reader* (Oxford University Press, 2005) at 401.

[18] McHarg and others (eds) *Property and the Law in Energy and Natural Resources* (Oxford University Press, 2010), at 1.

at the core of natural resources law.[19] Property law therefore has a strong influence on the development of core legal principles in natural resources law ranging from the definition of rights of control and access to resources to the institutional structures for resource exploitation and conservation.[20] However, property rights were never regarded as absolute even in the early development of common law.[21] Over time, states have played a greater role in the management of natural resources in most legal systems, co-existing with—but generally not displacing—systems of private property rights. Even where a state pursues a national model of resource ownership and the vesting of resources in place, it commonly grants legal instruments as the means to develop natural resources.[22] Such instruments (eg legal entitlement under a resource permit or licence) are often considered to have proprietary or property-like characteristics.[23] The property holding in natural resources granted by such an instrument grants legal rights to access and/or extract a resource but does not usually grant ownership of the resource in situ.

State[24] ownership and control occur for various reasons.[25] Resources may be highly valued economically (as with petroleum or gold) or resource sustainability concerns may justify public rather than private ownership. New Zealand is an example of a national-ownership[26] model where the state has vested resources in itself and via its agencies grants rights to resources to private resource users. Nevertheless, there are some exceptions.

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[19] Barry Barton "Property Rights Created under Statute in Common Law Legal Systems" in McHarg and others (eds) (2010), above n 18, at 80.

[20] McHarg and others (2010), above n 18, at 1.

[21] David Grinlinton "The Context of Environmental Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (2nd ed, Thomson Reuters, 2018) at [2.4].

[22] McHarg and others (2010), above n 18, at 1. This can be contrasted to the United States of America where historically property in natural resources was privately owned.

[23] See generally, Barton (2010), above n 19, at 80; and David Grinlinton "Evolution, Adaption, and Invention: Property Rights in Natural Resources in a Changing World" in David Grinlinton and Prue Taylor (eds) *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (Martinus Nijhoff Publishers, Boston, 2011) at 275.

[24] State sovereignty – a construct of international law – is the right of a state to control matters and resources within its territory, and is distinguished from ownership; see United Nations *Permanent Sovereignty over Natural Resources*, GA Res 1803 (XVII) (1962).

[25] For example, for reasons of social equity, and efficiency; see Barry Barton "The Common Law of Subsurface Activity: General Principle and Current Problems" in Donald N Zillman and others (eds) *The Law of Energy Underground: Understanding New Developments in Subsurface Production, Transmission, and Storage* (Oxford University Press, 2014) at 35.

[26] Note no distinction is made in the thesis between the terms nationally-owned, publicly-owned, state-owned, or Crown-owned resources.

The Crown now recognises the relationship between Māori and South Island pounamu (greenstone); consequently, Māori are the resource owner.[27] The situation with fisheries[28] and geothermal resources is similar.[29] Although Māori legal rights to natural resources—interests akin to ownership—have not been consistently recognised and provided for in law, it is acknowledged that Te Tiriti guarantees to Māori remain. Under the national-ownership resources model, the legal interests of parties involved in natural resource management are (broadly) those of Māori, the state, the public (including special interest groups) and private resource developers.

By analysing the substance and processes of legal requirements for information in natural resources law, this thesis examines how these parties' different legal interests are reflected (or not) in natural resources law.

1 The "Natural Resource Bargain"

A central theme in natural resources law is that resource exploitation is often carried out by a party distinct from the owner of the resource—particularly where natural resources are vested in the state—because resource development may often be financially high-risk. A company carries risk more readily than the resource owner; furthermore, a private sector industry rather than the resource owner may have the expertise to develop a particular resource. In granting legal instruments to property-like holdings in natural resources, an ongoing legal relationship is created between the owner and instrument holder. This relationship is central to both natural resource development and to this thesis because it is within this legal relationship and the terms of the legal instrument granted that the legal information requirements examined play out.

The interaction between a resource owner and the party exploiting the owner's resource produces what can be considered a natural resource "bargain" where the different incentives, interests and priorities of the two parties are reconciled.[30] A developer (usually a private company) has a commercial orientation and timeframe for resource development and seeks an

[27] Ngai Tahu (Pounamu Vesting) Act 1997.

[28] Treaty of Waitangi (Fisheries Claims) Settlement Act 1992; Fisheries (South Island Customary Fishing) Regulations 1999; Fisheries (Kiamoana Customary Fishing) Regulations 1998; Maori Fisheries Act 2004; and Maori Commercial Aquaculture Claims Settlement Act 2004.

[29] See for example, Ngāti Tuwharetoa (Bay of Plenty) Claims Settlement Act 2005; Affiliate Te Arawa Iwi and Hapu Claims Settlement Act 2008; and Ngāti Rangiteaorere Claims Settlement Act 2014.

[30] Barry Barton "The Mining Bargain and Natural Resources Law" (from proceedings *Tracing the Veins* hosted by Massey University Political Ecology Research Centre and Wageningen University Centre for Space, Place and Society, June - July 2020). For Barton's wider discussion of the natural resource bargain concept, see Barry Barton "A Core Concept in Natural Resources Law: The Nexus Between Owner and Operator" (2022) 40 JENRL 2.

immediate return on its investment, security of access to the resource and fair and economically justifiable terms of use. The owner on the other hand is likely to have a longer-term view of the resource and the maximum, optimal benefits to be gained from the resource over time. This is especially the case for state-owned and Māori-owned resources where matters of social and intergenerational equity, and/or resource sustainability or scarcity arise. A natural resource bargain can be a blend of property law, contract and legislation.[31] Where a resource is state-owned, the bargain is usually made under statute law, as in New Zealand for geothermal, fisheries and petroleum resource bargains.

Statutory provisions contain the broad terms of the natural resource bargain, what resource may be exploited, by whom, under what process and on what terms. The bargain between the state and developer concerns the developer's exploitation of the state's resource. This bargain is special to natural resources law and is distinguished from environmental management, where the state imposes regulatory constraints on the way other people use *their* property or *their* resources.[32]

Over the course of their relationship (often over multiple decades), a resource developer and resource owner agree to exchange certain types of information pertaining to the terms of the bargain. These make up core, legal information requirements in natural resources law and ensure a resource developer fulfils its terms in the bargain. The resource owner can only know whether resource exploitation is carried out as agreed if resource exploitation activity is accurately recorded. Within the terms of the bargain, it is a resource developer's legal duty to make and maintain such records and to supply this information to the resource owner on an agreed basis. Such records are usually made and supplied by resource users regularly (either quarterly or annually) over decades. Most natural resource legislation therefore contains specific provisions relating to the supply of certain types of information from the developer to the state. These provisions form part of the bargain and the legally enforceable conditions of resource exploitation. Foremostly in natural resource law and statutes, the information resource developers are required to provide the resource owner with is the quantity, rate, location and duration of resource use. Where resource sustainability is relevant, additional information and use constraints (and/or specific exploitation or management techniques) will apply. In turn, the

[31] Andrew R Thompson "Legal Characteristics of Disposition Systems: An Overview" in Nigel Bankes and J Owen Saunders (eds) *Public Disposition of Natural Resources* (Canadian Institute of Resources Law, University of Calgary, 1984) at 6.

[32] Barton (2020), above n 30, at 4.

resource owner must check the accuracy of such records and information in order to assess the developer's compliance with the terms of the bargain. Where the owner is the state, it is also thereby able to give an account of its management of the resource to the public.

The natural resource bargain is typically a bilateral agreement between the owner and the developer in a multilateral and pluralistic[33] world. For the purpose of this thesis and the legal information requirements examined, the idea of the natural resource bargain is used primarily to consider this two-way relationship in traditional natural resources law. However, the thesis explores the extent to which other legal interests are (or should be) taken into account in a given natural resource bargain.

B Natural Resources Law Development in New Zealand

New Zealand's current law for natural resources has largely retained and promoted a traditional, property-oriented, economic-development approach to natural resource exploitation. However, the recognition of Māori rights in natural resources has impacted natural resources law in recent decades. Land and natural resources are at the core of conflicts between Indigenous peoples and settlers in settler-colonial nations.[34] Disputes about resource ownership and management in Aotearoa New Zealand have been examined by legal scholars who have often approached these questions through detailed discussions of the various cases considered by the courts and the Waitangi Tribunal.[35] Although this thesis does not address underlying issues of resource ownership, it is important to note that such legal disputes illustrate that resource management (and in some cases the question of resource ownership itself) remains contested[36] and to note the requirement for the Crown to honour Te Tiriti o Waitangi commitments to Māori.

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[33] At 6. See also Barry Barton "Underlying Concepts and Theoretical Issues in Public Participation in Resources Development" in Donald Zillman, Alastair Lucas, and George (Rock) Pring (eds) *Human Rights and Natural Resource Development: Public Participation in the Sustainable Development of Mining and Energy Resources* (Oxford University Press, 2002) at 90.

[34] Maria Bargh and Estair Van Wagner "Participation as Exclusion: Māori engagement with the Crown Minerals Act 1991 Block Offer Process" (2019) 10 Journal of Human Rights and the Environment 1, 118-139.

[35] See for example, Carwyn Jones *New Treaty, New Tradition: Reconciling New Zealand and Māori Law* (UBC Press, Vancouver, 2016); Jacinta Ruru, "The Right to Water as the Right to Identity: Legal Struggles of Indigenous Peoples of Aotearoa New Zealand" in F Sultana and A Loftus (eds) *The Right to Water: Politics, Governance and Social Struggle* (Earthscan, Abingdon 2012); Jacinta Ruru "Indigenous Peoples' Ownership and Management of Mountains: The Aotearoa/New Zealand Experience" (2004) 3 Indigenous LJ 111; Katharina Ruckstuhl, Michelle Thompson-Fawcett and Hauauru Rae "Māori and Mining: Indigenous Perspectives on Reconceptualising and Contextualising the Social Licence to Operate" (2014) 32 Impact Assessment Project Appraisal (4) Social Licence to Operate and Impact Assessment, 304-314.

[36] Bargh and Van Wagner (2019) above n 34, at 122. See also for example, Waitangi Tribunal *The Stage 2 Report on the National Freshwater and Geothermal Resources Claims* (*Stage 2 Report on Freshwater and Geothermal*)

Broadly, the ownership and regulation of natural resources poses important questions about the allocation of wealth and power in a society.[37] How resources are allocated and managed speaks to a state's intent about the function of property in natural resources. It is therefore useful to consider this area. Vesting property in the Crown is in effect the mechanism through which the state asserts control over resources.[38] Therefore, state-ownership of land and resources means that control and regulation of natural resources should occur in a manner which ultimately reflects public rather than private ownership. For example, although a resource user can act in a steward-like manner with resource exploitation—and indeed may be legally required so to act—a resource user (often a private company) does not ultimately play the role of resource steward. Rather, the primary goal of a resource developer is to exploit resources for financial gain.

It is the Crown and Māori who act/s as a proprietor and steward of resources on behalf of the public or an iwi/hapu (tribe/subtribe).[39] Where Māori ownership or Te Tiriti interests occur in natural resources, these should reflect Māori values. Therefore, regarding environmental matters and resources in which Māori have a special interest, it is crucial that law and regulation provide for public (and Māori-specific) functions of property in natural resources. By reviewing both the functions of property in natural resources and legal provisions for information about resource exploitation in law, the thesis posits that natural resources law has scope to better integrate public and Māori rights and interests in natural resource management.

1 Te Tiriti o Waitangi, Treaty of Waitangi 1840

The legal recognition of the rights of Indigenous peoples in natural resources has impacted the development of natural resource property rights concepts in New Zealand and internationally. In many countries, the Indigenous rights to natural resources is and should be a paramount consideration in the development of natural resources.[40] New Zealand's constitution is distinctly characterised by a dynamic relationship between the Crown and Māori as provided for in Te Tiriti o Waitangi 1840.[41] While different understandings of Te Tiriti and its status are

(Wai 2358, 2019); and further Elizabeth Macpherson *Indigenous Water Rights in Law and Regulation* (Cambridge University Press, 2019) at 99-130.

[37] Richard Barnes *Property Rights in Natural Resources* (Hart Publishing, 2009).

[38] Lee Godden "Property in Urban Water: Private Rights and Public Governance" in Patrick Troy (ed) *Troubled Waters: Confronting the Water Crisis in Australia's Cities* (ANU Press, Canberra, 2008).

[39] Note Māori is not used in the generic sense here because Māori rights can vary between particular iwi and hapu.

[40] Barton (2020) above n 30, at 7.

[41] Treaty of Waitangi Act 1975 sch 1.

contested,[42] both Māori and the Crown nonetheless recognise Te Triti as a foundational pillar in New Zealand's constitutional framework.[43]

This relationship affects natural resources law in New Zealand and thus by extension includes the Crown-recognised property interests of Māori in their taonga (tangible and intangible treasures).[44] Therefore, as part of an examination into the particular role played by legal provisions for information, this thesis examines the degree to which the Crown/Māori relationship and Māori property rights and/or interests in natural resources are acknowledged in current (and proposed)[45] legal information requirements to manage natural resources.

2 Environmental Law

In recent decades, environmental law considerations have also tempered natural resource law. Environmental law grew from a consensus that the effects of human activity on the environment should be regulated due to growing resource scarcity, environmental degradation and human health concerns.[46] Environmental law has increased the regulatory scope of natural resource exploitation to include the regulation of resource extraction methods and resource use and disposal to safeguard public health and ecological values.[47] Where natural resource exploitation was historically a matter of perfecting the appropriate property rights in resources, resource management agencies today play a crucial role in the "conditioning" of resource use.[48] Conditions often include legal information requirements to monitor and assess the ongoing environmental effects of resource exploitation; furthermore, an assessment of environmental effects is often mandatory before resource exploitation activity is approved. Principles of environmental law such as sustainable management and the precautionary principle now have a direct bearing on the operation and development of natural resources law.

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[42] See Malcolm Mulholland and Veronica Tawhai *Weeping Waters: The Treaty of Waitangi and Constitutional Change* (Huia Publishing, Wellington, 2010); Jones (2016), above n 35; Moana Jackson "The Treaty and the Word: The Colonisation of Māori Philosophy" in Graham Oddie and Roy Perett (eds) *Justice, Ethics and New Zealand Society* (Oxford University Press, Auckland, 1992).

[43] *New Zealand Māori Council v Attorney General* (*NZ Maori Council*) [1987] 1 NZLR 641 (CA) at 656.

[44] Te Tiriti 1840 art II, Treaty of Waitangi Act 1975 sch 1.

[45] For example, Ministry for the Environment *Natural and Built Environments Bill* (Consultation Draft, June 2021); see further at <www.environment.govt.nz/what-government-is-doing/key-initiatives/resource-management-system-reform/>.

[46] See David Grinlinton "Defining the Nature and Boundaries of Environmental Law" in *Environmental Law in New Zealand* Peter Salmon and David Grinlinton (eds) (2nd ed, Thomson Reuters, 2018) at [2.3].

[47] Fischman (2007), above n 1, at 721.

[48] At 718.

Administrative law which addresses the legal regulation of governance particularly the decision-making process and the way in which decisions are made also has an important role in natural resource management. In a broad context, environmental law has a particular role as a branch of administrative law.[49] Administrative justice in environmental law identifies the proper criteria for different kinds of decision-making to ensure the right matters are considered and focuses on "natural justice" concepts such as public participation in decision-making, public hearings and public access to environmental information.[50]

While the principles of these "new" areas of law overlying traditional natural resources law carry legal weight in themselves and are now definite fixtures in the natural resource management framework, this research contends that the adaptability of property law and the role of the state in authorising changes to a property regime are arguably the most effective way to adjust legal rights and duties of those with property interests in natural resources.[51] By extension, it suggests that information requirements are an effective means to achieve this end.

III Overview of Non-legal Influences in Natural Resources Law in New Zealand

Non-legal influences in the development of New Zealand's natural resources law—including historical events, political ideology and economic theory—provide insights into both the values shaping today's natural resource law and the ongoing ideological and conceptual tensions in play as they affect property holdings and importantly the scope and content of legal requirements for information about resource development (the terms of the bargain). The Crown's historical treatment of Māori rights in natural resources and an overview of their recognition in natural resource law is made to identify how ideology and conceptual influences have affected the degree to which statutory information requirements may or may not have served Māori rights in natural resources law.

A The Evolving Role of the State and Natural Resources

Although the Waitangi Tribunal found that the northern Māori chiefs did not cede their sovereignty to the Crown, in 1840 the British Crown nonetheless asserted the right to govern

[49] Sian Elias, former Chief Justice of New Zealand "Righting Environmental Justice" (12th Annual Salmon Lecture, Auckland, 25 July 2013) at 2.

[50] Trevor Daya-Winterbottom "The Role of Administrative Law" in *Environmental Law in New Zealand* Peter Salmon and David Grinlinton (eds) (2nd ed, Thomson Reuters, 2018) at [6.1].

[51] Barnes (2009), above n 37. See also Grinlinton (2011), above n 23, at 275; and McHarg and others (2010), above n 18, at 1-16.

and the right of paramount ownership of the territory, subject to the existing rights of Māori according to the doctrine of aboriginal title.[52] At this time, the accession theory under English common law was that those who owned land titles granted by the state had rights to all resources on and under their land, including water and minerals (except gold and silver minerals). Gradually, this theory extended to include minerals such as petroleum and coal and increasingly law was passed vesting ownership of natural resources in the Crown.[53] This high degree of Crown-ownership of natural resources in New Zealand did not take into account existing Māori rights; it is characteristic of New Zealand's public lands and resources management and generally occurred in direct response to resources becoming valued economically.[54]

Until the mid-20th century, the state assumed responsibility for developing infrastructure and public services. After WWII, large-scale public works aimed at speeding up economic development and national self-sufficiency were state-initiated and developed. From the 1950s–1970s, the state undertook major construction and development of hydroelectric and geothermal power stations and retained direct control of such developments during the "Think Big" era (1973–1984) until their conversion to "state-owned enterprises" under the neoliberal political agenda of the 1980s.[55] This agenda extended further to the 1990s' swift and radical privatisation era which saw the sale of many state-owned enterprises (including state development of natural resources) to private companies.[56] Privatisation of former state-owned enterprises, deregulation and the contracting out of state services reflected changes in the perceived role of the state from a paternalistic state and highly regulated economy to one placing faith in the ability of a market to reflect citizens' preferences. At continued cost to Māori rights and interests, the state's changed role reflected New Zealand's political, social

[52] See *Te Runanganui o Te Ika Whenua Inc Society v Attorney-General* [1994] 2 NZLR 20 (CA) at 23-24 per Cooke P. See further, Paul McHugh "New Dawn to Cold Light: Courts and Common Law Aboriginal Rights" in R Bigwood (ed) *Public Interest Litigation: New Zealand Experience in International Perspective* (LexisNexis, 2006).

[53] Regarding nationalisation of mineral resources in common law countries generally, see Barton (2014) above n 25, at 35.

[54] Richard Boast "Property Rights and Public Law Traditions in New Zealand" (2013) 11 NZJPIL 1 Special Conference Issue 161-182 at 169.

[55] See State Owned Enterprises Act 1986.

[56] See generally, Jane Kelsey *The New Zealand Experiment: A World Model for Structural Adjustment?* (Auckland University Press with Bridget Williams Books, 1995).

and economic development from a colonial outpost to an independent nation state pursuing its own social and economic policies.[57]

The 1980s and 1990s economic reform period also introduced a host of new legislation for natural resource exploitation and management that included fisheries, petroleum and geothermal resources. Thus, economic, free-market reform has left an enduring mark on New Zealand's natural resource law with an overall purpose for natural resources being (more or less) full exploitation within environmental limits. However, as is the nature of reform, many aspects of reform, including statutory provisions for national environmental standards and national resource policy strategies; the increased power and responsibility of local authorities and regional councils; the fuller incorporation of Māori rights and interests in law and provisions for Māori involvement in natural resource management were untested.[58] To a certain extent, as a result of this significant reform period the statutory regimes examined in this study and their accompanying, related regulation, policy and rules and regulatory processes reflect a distinctly experimental, try-it-and-see management ethos.

Today, natural resources are developed primarily via government-issued instruments such as licences, permits and lease agreements to privately held companies or individuals. Although the state retains ownership and ultimate control of most natural resources, its role has markedly changed from owner-developer to owner-manager of natural resources. In the state's proprietary role, the need for the natural resource bargain and the state's need for information about resource exploitation carried out by private resource developers is more starkly evident.

B Recognition of Māori Rights in Natural Resources

Māori property rights in land and natural resources in pre-contact times arose under well-established principles of customary law.[59] Despite the Crown guarantees to Māori as articulated in Te Tiriti, colonial governments and the courts often failed to uphold the pre-existing and

[57] David P Grinlinton "The History and Development of Petroleum Law and Policy in New Zealand" (1995) 8 Otago LR 3 375-412 at 376; and see generally Brian H Easton *Not in Narrow Seas: The Economic History of New Zealand* (Victoria University Press, 2020).

[58] Geoffrey Palmer "The Resource Management Act: -How we Got It and What Changes are Being Made to It" (from proceedings Resource Management Law Association, New Plymouth, 27 September 2013) at 13-15.

[59] Paul McHugh *The Māori Magna Carta: New Zealand Law and the Treaty of Waitangi* (Oxford University Press, 1991) at 73-76.

unextinguished legal rights of Māori.[60] The ideological and conceptual influences affecting this failure were based on the perceived superiority of English/European law compared to Indigenous law and customs. However, the colonial government's rapacity to secure more land was used to justify the paternalistic and assimilationist agendas of colonial governments and the courts.[61] The resulting land loss, loss of access to natural resources[62], the Crown's unilateral vesting of resources in itself via legislation[63] and the propertisation[64] and privatisation of resource exploitation[65] did not occur without consistent objections from Māori who since the earliest days of colonisation entreated the Crown to honour their rights to their lands and natural resources as guaranteed under the Treaty.[66]

It was not until the passing of the Treaty of Waitangi Act 1975 that any progress was made regarding legal recognition of Māori rights as guaranteed by Te Tiriti.[67] While recognition of Māori rights did occur in some instances from 1840, their application was largely marginalised. Māori rights as reflected in natural resource law provisions for Māori-relevant information did not exist. Although the Crown has since 1840 claimed many existing Māori rights to natural resources, in recent decades considerable attention has been given to Māori rights and to the interpretation of Te Tiriti with the Waitangi Tribunal, the Court of Appeal and academics adding considerably to this process.[68] Despite the discrepancy in interpretation between the English and Māori texts of Article II of Te Tiriti, tension between the tino rangātiratanga

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[60] For example, *R v Symonds* (1847) NZPCC 387 (SC); *Wi Parata v The Bishop of Wellington* (1877) 3 NZ Jur (NS) 72 (SC); *Te Weehi v Regional Fisheries Officer* [1986] 1 NZLR 682 (HC); and *NZ Māori Council*, above n 44.

[61] See for example, the Law Commission summary in *Maori Custom and Values in New Zealand Law* (NZLC SP9, 2001) at [97] – [115].

[62] Waitangi Tribunal *The Pouakani Report* (Wai 33, Wellington, 1993).

[63] See for example Richard Boast "New Zealand Law and the Geothermal Resource: A Report" to the Waitangi Tribunal (1991) at [4.16] regarding petitions to the Crown by Māori about their ownership of land and customary rights in geothermal resources affected by the Scenery Preservation Act 1903. See also Valmaine Toki "Rights to Water an Indigenous Right?" (2012) 20 Wai L Rev 107-110 at 109.

[64] *Te Runanga o Muriwhenua Inc v Attorney-General* [1990] 2 NZLR 641 (CA) and the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.

[65] Māori objected to the Crown's sale of state-owned natural resource assets in fear that existing customary rights to natural resources would be compromised. See for example, *NZ Māori Council*, above n 44; and *New Zealand Māori Council v Attorney-General* [1989] 2 NZLR 142 (CA).

[66] MPK Sorrenson "Māori and Pakeha" in Geoffrey Rice (ed) *The Oxford History of New Zealand* (2nd ed, Oxford University Press, 1992) at 141.

[67] See Ranginui Walker *Ka Whawhai Tonu Matou – Struggle Without End* (Penguin, Auckland, 1990). See also Justice Joseph Williams "Lex Aotearoa: An Heroic Attempt to Map the Māori Dimension of Modern New Zealand Law" (Harkness Henry Lecture) (2013) Wai L Rev 1 at 11.

[68] McHugh (1991), above n 59, at 4.

(absolute sovereignty/self-determination) guaranteed in Art II and the kawanatanga (governance) ceded in Art I, and the fact that 500 Māori signed the Māori text version and only a handful signed the English text version, the Crown yet defers to the English text which claims sovereignty over Māori.

Legislation does not include either version of the Te Tiriti; rather, "Treaty principles" in law guide its contemporary application.[69] The Waitangi Tribunal has described a number of Treaty principles through its various reports.[70] One of the central principles as expressed by the Tribunal has particular relevance for natural resource management and it has been described as a principle of paramount importance,[71] ie the Crown's obligation to recognise rangātiratanga which may include an Iwi right to manage resources in a manner compatible with Māori custom.[72] The Tribunal has suggested that it was an intrinsic principle of the Treaty that Māori would recognise and respect the Crown's right to national governance, while the Crown would recognise and respect Māori and their rangātiratanga.[73]

Both rangātiratanga and the property guarantee of Art II relate to questions of environmental quality and control.[74] Art II described the basis for dealing with natural resources[75] and guaranteed the full, exclusive and undisturbed possession of resources as long as Māori wished to retain them. The kaitiaki (guardian) status of Māori has been accepted as an aspect of Māori rangātiratanga and is reflected in general law[76] and in specific cases of Crown redress to Māori

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[69] See Joseph Williams *Laws of New Zealand* Treaty of Waitangi (online ed) at [3]; and *New Zealand Māori Council*, above n 44. The "principles of the Treaty of Waitangi" is a Crown construct that was first incorporated into legislation in the Treaty of Waitangi Act 1975 and was designed to bridge any gap between the English and Maori language versions of the Treaty's two texts. There is no definitive list of principles of the Treaty, rather they are drawn from the two texts interpreted in the light of the circumstances surrounding the signing of the Treaty; see Waitangi Tribunal *Report on the Orakei Claim* (Wai 9, 1987).

[70] See Waitangi Tribunal *Report of the Waitangi Tribunal on the Muriwhenua Fishing Claim* (Wai 22, Wellington, 1988). The Treaty principles have been described broadly as including: a duty on both Māori and the Crown to act reasonably and in good faith; the active protection of Maori interests by the Crown; the remediation of past grievances; the right of the Crown to govern by pursuing its policies in the interests of the whole community; and reciprocity, where governance or sovereignty has been exchanged for rangitiritanga or control over resources. See further, Williams, above n 69.

[71] Waitangi Tribunal *The Ngai Tahu Report* (Wai 27, 1991) at 269.

[72] Waitangi Tribunal *The Ngai Tahu Report* (Vol III) (Wai 27, 1991) at 824.

[73] Waitangi Tribunal *Muriwhenua Land Report* (Wai 45, 1997) at 390.

[74] McHugh (1991), above n 59, at 6-8.

[75] Briar Gordon "Treaty of Waitangi and Māori Issues in Environmental Law" in *Environmental Law in New Zealand* Peter Salmon and David Grinlinton (eds) (2nd ed, Thomson Reuters, 2018) at [8.2].

[76] Waitangi Tribunal Report *Ko Aotearoa Tenei*: *A Report into Claims Concerning New Zealand Law and Policy Affecting Māori Culture and Identity* (Vol I) (Wai 262, 2011) at [3.5.1]. See also for example, Resource Legislation Amendment Act 2017 s 50 (introduction of Mana Whakahono a Rohe, Iwi participation arrangements).

via the Treaty Settlement Process where co-governance arrangements for natural resources between the Crown and Māori occur.[77] The legislation governing the natural resources examined in this thesis contains Treaty clauses: the RMA ss 6, 7, and 8; Fisheries Act s 5 and CMA s 4. Māori rights of rangātiratanga bestow unique proprietary-type interests in natural resources on Māori as reflected in Māori principles of kaitiakitanga (stewardship[78]) of natural resources. Therefore, the language of partnership rather than the fiduciary relationship more accurately reflects a modern application of the Crown/Māori relationship as guaranteed under the Treaty thus enabling better understanding of Māori's unique role as kaitiaki of New Zealand's natural resources.

The degree to which Māori are able to fully express their rights regarding natural resource management and interests in natural resources is contested and remains open to greater actualisation by both the Crown and Māori. While some rights of ownership for Māori in natural resources have been decided, others remain to be determined.[79]

IV Natural Resource Regulation

Regulation and theories of regulation are instrumental to answering the research question because regulatory instruments are usually developed to carry out higher-order goals of meta legal instruments such as legislation. Regulatory rules set out the more specific terms of the natural resource bargain, whereas theories of regulation inform the types of rules, the resource management process and the ongoing engagement between the primary parties in a regulatory relationship. In the common case of state (or public) ownership of resources administered under regulatory-like statutes, the regulatory relationship set between parties embodies a state's view of how control over natural resources should occur, what part/s of the state are involved (eg which state agencies), the scope of authority used, how it is exercised and whose interests are represented in decision-making.

[77] See for example Waikato Tainui Raupatu Claims (Waikato River) Settlement Act 2010

[78] For a more nuanced interpretation of kaitiakitanga see Merata Kawharu "Kaitiakitanga: a Māori Anthropological Perspective of the Māori Socio-Environmental Ethic of Resource Management" (2000) 109 J Polynesian Society 4, 349-370.

[79] See for example, *Stage 2 Report on Freshwater and Geothermal* (2019), above n 37, and *The Stage 1 Report on the National Freshwater and Geothermal Resources Claim* (Wai 2358, Wellington, 2012) regarding ownership of geothermal resources. See also *Ngāi Tai ki Tāmaki Tribal Trust v Minister of Conservation* [2018] NZSC 122, [2019] 1 NZLR 368 for narrative on the Crown's onus.

While there are as many ways to describe regulation as there are activities to regulate, regulation can be viewed as:[80]

> A process intended to alter activity or behaviour, or to carry out an ordering, often by restricting behaviour, but at times enabling or facilitating behaviour that would otherwise not be possible.

A theory of regulation can be viewed as a set of propositions or hypotheses about why regulation emerges, which actors contribute to that emergence and typical patterns of interaction between regulatory actors.[81] The legal analysis of regulation is a distinct field of academic enquiry spanning many regulation types and regulatory settings. Regulation has also become a multi-disciplinary field with substantial contributions being made by political scientists, lawyers, sociologists, anthropologists and others.[82]

Regulation has reached a state of maturity in both an intellectual and a "world of practice" sense. Intellectually, there has been a distinct process of maturation in the development of theoretical perspectives and lenses that are capable of application to the analysis of generic processes of regulation across specific sectors and across cultural contexts.[83] So-called "command and control" was the traditional starting point of both regulators and regulatory scholars in the 1960s and 1970s; however, by the 1980s numerous studies had outlined the deficiencies of such systems and called for the introduction of "less restrictive" and "incentive-based" controls.[84] Stemming from widespread advocacy of "deregulation" in key industries and of the market, the policy dynamic shifted to focusing on regulations' quality and direction.

New Zealand has not acted in isolation from other countries in developing regulations for natural resource management; nor is regulation of natural resources a recent phenomenon.[85]

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[80] Barry Barton "The Theoretical Context of Regulation" in Barry Barton, Lila K Barrera-Hernández, Alistari R Lucus and Anita Ronne (eds) *Regulating Energy and Natural Resources* (Oxford University Press, 2006) at 12 and 14. Within regulation scholarship it has become fairly orthodox to conceive of regulation as occurring in regimes that comprise rule making or standard setting, together with institutions for monitoring and mechanisms of enforcement. The regulation for geothermal, fisheries, and petroleum resources in New Zealand occurs within such statutory regimes. See also Ciara Brown and Colin Scott "Regulation, Public Law, and Better Regulation" (2011) 17 European Public Law 3, 467-484 at 474.

[81] Bronwen Morgan and Karen Yeung *An Introduction to Law and Regulation* (Cambridge University Press, 2007) at 16.

[82] Robert Baldwin, Martin Cave, and Martin Lodge "Introduction: Regulation – The field and the Developing Agenda" in Robert Baldwin, Martin Cave, and Martin Lodge (eds) *The Oxford Handbook of Regulation* (Oxford University Press, 2010) at 4.

[83] At 5.

[84] At 9.

[85] Barry Barton "The Legitimacy of Regulation" (2003) 20 NZULR 364-401 at 380.

Regulation has become increasingly important in managing natural resources.[86] The corporatisation and privatisation eras in New Zealand reduced the state's direct involvement in resource development (and thereby its direct control); consequently, new forms of regulatory control had to be devised.[87] Since the 1990s, successive governments have promoted various regulatory review programmes, including risk-assessment and cost-benefit analysis[88]—usually with a focus on regulatory impact assessments. As an OECD member, New Zealand develops policies for *Better Regulation* in response to concerns about the growth of regulation and its efficiency and effectiveness.[89] As an interest in rational planning tools in regulatory policy-making fuels this response, the scope for bureaucratic and political knee-jerk regulation is limited.[90] Supported by independent research and academic agencies,[91] this area sees ongoing review by the government.

As a New Zealand Productivity Commission's report to central government on improving the design and operation of regulatory regimes noted:[92]

> It is important to recognise that there is no single superior regulatory strategy. […] The key lies in understanding and adapting regulatory strategies to take account of the influences and dynamics of the many different contexts in which they are deployed. […] Modern regulatory practice requires a deep and nuanced institutional analysis of the motivations, interactions and institutional environments of the regulatory actors in regulatory regimes.

In examining natural resource information requirements and operations in practice, this thesis investigates these influences and dynamics within the respective regulatory regimes for geothermal, fisheries and petroleum resources in order to assess the impact of regulatory theory and practice on the composition and the fulfilment of legal requirements for information. Such

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[86] Barton and others "Introduction" in Barton and others (eds) (2006), above n 80.

[87] See Barton and others (2006), above n 80, at 4. Also Karen Yeung "The Regulatory State" in Baldwin, Cave and Lodge (eds) (2010), above n 82, at 65-68.

[88] Jane Kelsey "'Regulatory Responsibility': Embedded Neoliberalism and its Contradictions" (2010) 6 Policy Quarterly 2 at 36. See for example, New Zealand Treasury *Government Expectations for Good Regulatory Practice* (April 2017). See further Brown and Scott (2011), above n 80, at 471.

[89] See for example Regulatory Standards Bill 2021 (27-1) aimed at improving the quality of regulation in New Zealand at <www.parliament.nz>; New Zealand Treasury *Government Expectations for Good Regulatory Practice* (April 2017); and New Zealand Productivity Commission *Regulatory Institutions and Practices* (June 2014).

[90] Baldwin, Cave and Lodge (2010), above n 82, at 8.

[91] See New Zealand Law Foundation Regulatory Reform Project and Victoria University of Wellington's Faculty of Law research and publications at <www.wgtn.ac.nz/law/research/our-research/regulatory-reform>.

[92] New Zealand Productivity Commission (2014), above n 89, at 4.

investigation and analysis help to answer the research question regarding whether existing information requirements within these regimes portray optimal legal characteristics for managing natural resources in the 21st century.

The definitive feature of conventional regulation is that it is designed to solve a problem on the basis of evidence regarding what is likely to achieve the regulatory objective. Conventional regulation is often identified with the use of persuasive and collaborative strategies by regulators to win regulatee cooperation and is thus distinguished from deterrence-based or prescriptive regulation which involves prosecution and punishment.[93] The majority of natural resource regulation in New Zealand is conventional regulation. While conventional regulation may well include processes for prosecution and punishment, it aims for a middle ground between deterrence-based control and general rules. Hence, it addresses the three main problems associated with the use of rules in any context: rules' tendency to over- and under-inclusiveness, indeterminacy and interpretation.[94] Deterrence-based types of regulation can be inefficient[95], especially when the underlying assumption that the regulatory agency "knows best" is in dispute. Whether or not a regulatory agency knows best about how to regulate resource exploitation can depend on many factors: the scope of an agency's mandate and the level of its funding; the qualifications and experience of agency staff; an agency's information management systems and who has input into policy and rule-formulation. As the New Zealand state moved from owner/developer of natural resources to owner/manager, technical expertise within agencies generally diminished and shifted to private enterprise.[96] This shift and dispersal of knowledge has been acknowledged and accounted for in compliance strategy—for example as expressed in the commonly applied VADE model of regulatory compliance in New Zealand.[97] As a form of "responsive regulation", VADE is built on the idea of Ayres and

[93] Christine Parker "Reinventing Regulation within the Corporation: Compliance-oriented Regulatory Innovation" in Colin Scott (ed) *Regulation* (Dartmouth Publishing, United Kingdom, 2003) at 391 and 393.

[94] Julia Black *Rules and Regulation* (Clarendon Press, Oxford 1997) at 6.

[95] Rasband, Salzman and Squillace (2004) above n 3, at 68-69.

[96] Toni Makkai and John Braithwaite "In and Out of the Revolving Door: Making Sense of Regulatory Capture" (1992) 12 Journal of Public Policy 1, 61-78.

[97] Ministry for the Environment *New Directions for Resource Management in New Zealand: Report of the Resource Management Review Panel* (*New Directions*) (June 2020) at 395. See also Department of Internal Affairs *Achieving Compliance: A Guide for Compliance Agencies in New Zealand* (*Achieving Compliance*) (June 2011) at 38-40.

Braithwaite's four-levelled "enforcement pyramid":[98] Voluntary compliance; Assisted compliance; Directed compliance and Enforced compliance. Responsive regulation is broadly summarised in the Productivity Commission's quote above. Most distinctively, responsiveness implies a new view not only of what triggers regulatory intervention but also leads to innovative notions of what the response should be.[99]

Conventional and reflexive regulation recognises scholarship's long-standing concern to: look beyond formal, rule-based regulation; promote the use of a mixture of instruments and actors to seek desired outcomes and overcome limits of state capacity.[100] This "decentring" of regulatory control is somewhat paradoxical in natural resource management especially where the state is the resource owner (or manager on the public's behalf) and where a resource developer possesses only use rights.[101] The line where the state should or should not intervene can become blurred.[102] Conventional regulatory approaches also include features of co-regulation.[103] Co-regulation refers to a degree of legislative underpinning in the creating of standards or rules by industry or legislation setting minimum standards which industry improves upon. The private industry bodies exploiting geothermal and fisheries resources in New Zealand both have significant input into policy and regulatory rule-making. Subsequent chapters identify the specific reasons (and legislative underpinnings) for this relevant to each industry. Industry participation in rule-making and co-regulation and the degree to which it occurs are examined because private industry expertise in natural resource exploitation typically transforms into the information and knowledge base on which management decisions are made.

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[98] John Braithwaite and Ian Ayres *Responsive Regulation: Transcending the Regulation Debate* (Oxford University Press, 1992) chapter 2. See also Christine Parker "Twenty years of responsive regulation: An appreciation and appraisal" (2013) 7 Regulation & Governance, 2-13.

[99] Braithwaite and Ayres (1992), above n 98, at 4.

[100] Brown and Scott (2011), above n 80.

[101] Julia Black "Decentring Regulation: Understanding the Role of Regulation and Self-Regulation in a 'Post-Regulatory World'" (2001) 54 Current Legal Problems 102. See also Julia Black "Proceduralisation and Polycentric Regulation" (2005) DIREITO GV L. Rev. Especial 1 99 at 102; Black clarifies "command and control regulation posits a particular role for the state against which the 'decentring' analysis is counter posed."

[102] However, decentred understanding of regulation is a useful concept, for example, when considering Māori-owned resources or where Māori have clear kaitiaki rights in resource management.

[103] Black (2001), above n 101, at 117.

A Regulation Theory in the Thesis

By drawing on Professor Julia Black's analysis of legal regulation which explores "regulatory conversations" in compliance-based regulation, this research explores the regulatory relationship and the nature of regulatory conversations between the natural resource regulator and the regulated.[104] For geothermal resource management, the regulator is a regional council and the regulated party is a resource consent (ie permit) holder. Ministry for Primary Industries, Fisheries (Fisheries NZ or FNZ) is the fisheries management regulator and is largely centralised. The regulated is either a fishing permit holder under the quota management system or a customary Māori, non-commercial rights holder under regulations. Similarly centralised, a central government agency—New Zealand Petroleum and Minerals (NZPAM)—regulates petroleum resource development.

Black's analysis examines the usefulness of regulatory conversations and what overall criteria must be present within a regulatory framework for regulatory conversations to contribute as a legitimate regulatory tool to avoid pitfalls such as: lack of transparency in decisions; eroding public trust; agency capture; the condoning of non-compliance and illegitimate alteration of regulation.[105] Using Black's work as an analytical framework, the thesis identifies regulatory processes for managing geothermal, fisheries and petroleum resources that are prone to Black's pitfalls and suggests policy and management process improvements to counter these.

While recourse is made to Black's analysis of regulatory conversations as applied to both commercial fisheries and geothermal resource regulation, the customary fisheries regulation analysis builds on her introduction of and suggested uses for discourse analysis in legal regulation analysis. Black suggests that discourse analysis can provide valuable insight about the dynamics between interpretive communities in a regulatory setting. Hence, its suggested application as a site of analysis is employed to analyse the North Island customary fishing regulations. Analysis of the regulatory relationship in the petroleum resource chapter is limited to the efficacy of information requirements for Māori under the CMA.

[104] Julia Black "Regulatory Conversations" (2002) 29 Journal of Law and Society 1 at 163-196.

[105] Black (2002).

1 *Black within the Regulation Literature*

Black's work emerged over the "deregulation" period where regulatory issues became viewed in terms of risks and risk management[106] and where de-centred regulation emphasises that regulatory regimes are often fragmented, multi-sourced and unfocused.[107] Risk continues to be used to define the objects of regulation; it is also used to determine the boundaries of a state's legitimate intervention in society. Where since the 1980s economic theory was the main contender for this role, risk-assessment now sits alongside economic considerations. In natural resources law, this shift may be seen in the emergence of environmental impact assessments which increasingly include climate change considerations. However, as a justification for government regulation, risk provides "an unstable base" posing normative and functional challenges.[108] In the context of natural resources and environmental management, it is worth considering how risk may be better understood as a justification for government regulation.

Black's work which combined legal analysis of regulation with discourse analysis also highlights the importance of understanding regulation as communication and as a network that requires its own specific codes of communication to deal with settings of diffused power. [109] Her definition and analysis of regulatory conversations between a regulator and regulated party within this context examines the processes of regulation: rule formation, interpretation and enforcement—including the motivations for "creative compliance" by the regulated.[110]

While Black's work does not examine environmental or natural resource regulation specifically, there are recognisable regulatory challenges identifiable within her area of expertise (financial services regulation) that may be applied to natural resources and environmental regulation, for example in decision-making accountability and in risk-management. The main difference between Black's work and the analysis of natural resource regulation is that natural resource regulation (usually) controls the private use of publicly-owned natural resources, while Black's

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[106] Julia Black "The Emergence of Risk-Based Regulation and the New Public Risk Management in the UK" (2005) Public Law, 512-419; Julia Black and Robert Baldwin "Really Responsive Risk-Based Regulation" (2010) 32 Law & Policy 2, 181-213. Julia Black "The Role of Risk in Regulatory Process" in Baldwin, Cave, and Lodge (eds) (2010), above n 83, at 302.

[107] Black (2001), above n 101, at 103-147.

[108] Black (2010) Baldwin, Cave and Lodge (eds), above n 82, at 323.

[109] Black (2002), above n 104, at 163-196; Julia Black "Talking about Regulation" in Michael Harris and Martin Partington (eds) *Administrative Justice in the 21st Century* (Hart Publishing, Oxford and Portland, Oregon, 1999) 246-277.

[110] Julia M Black "'Which Arrow?': Rule Type and Regulatory Policy" (1995) Public Law 1-16; Julia Black "Managing Discretion" (in ARLC Conference Papers *Penalties: Policy, Principles and Practice in Government Regulation*, June 2001).

area of regulation analysis (typically) concerns the control of public services or services affecting the public (eg the electricity market or media broadcasting). By implication, natural resource management issues of resource sustainability, depletion or irreversibility of environmental effects therefore bring a particular type of urgency to the management of public resources. Issues of contested ownership of or access to resources and the sometimes blurred line between public and private rights in natural resources are also relevant in a way that is not present in financial services regulation for example.

A wide range of regulatory styles can be found across international legal jurisdictions that deal with apparently similar issues. For example, environmental regulation in the United States has tended to be rigid and rule-oriented whereas the United Kingdom has tended towards informality and flexibility.[111] New Zealand's general style of environmental regulation is more identified with the latter. Despite such differences however, in the world of regulatory practice maturity within the regulation discipline has meant growing commonality evidenced by the emergence of a distinct international and national "regulatory community" that shares similar languages and concepts.[112] The language of regulation penetrates diverse policy domains; consequently, "regulatory agencies" and *Better Regulation* initiatives are part of the administrative landscape and ideas of standard-setting and enforcement now penetrate different policy and academic communities.[113] Formerly, such conversations remained distinctively within domains—be they energy, telecommunications, food safety, environmental or financial regulation.[114] The following analysis therefore recognises that while there may be limitations in applying Black's framework to natural resources and environmental regulation in New Zealand, there is also useful commonality. Indeed, due to the gravity of potential risks associated with natural resource management, including environmental, human rights and Indigenous rights issues, rather than posing limitations, the application of Black's framework could be *amplified* in a natural resource management context.

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[111] Robert Baldwin, Colin Scott and Christopher Hood (eds) *A Reader on Regulation* (Oxford University Press, 1998) at 22.

[112] Baldwin, Cave and Lodge (2010), above n 82, at 5. See for example, Australia and New Zealand School of Government (ANZSOG), and the public sector regulator network, the National Regulators Community of Practice, at <www.anzsog.edu.au/regulators>.

[113] For example see Organisation for Economic Co-operation and Development (OECD) "Recommendations and Guidelines on Regulatory Policy" at <www.oecd.org/gov/regulatory-policy/recommendations-guidelines.htm>; and OECD *OECD Regulatory Policy Outlook 2021* (OECD, October 2021) New Zealand chapter; and OECD *New Zealand: Indicators of Regulatory Policy and Governance 2021* (OECD, 2021).

[114] Baldwin, Cave and Lodge (2010), above n 82, at 5.

B Regulation and Information

All regulation and rule-making require information as a matter of process. By its nature, regulation is iterative and goal-oriented and because the creation of regulation is usually a systematic process it depends upon information-supply to shape and re-shape its goals. All stages within a policy development cycle rely on information. Thus, in regulation-making the cycle can involve gathering information to clarify the question(s), research the issue, understand the interests of affected persons, generate options, trial and monitor a chosen option and generate an organisational response to results. Regulatory design, rule-making and regulatory review require various kinds of information such as economic, environmental, social, technical and industry information. The sources of such information can be equally various and come from industry, non-governmental agencies, the public, academic experts or a wider research community. The monitoring, compliance and enforcement of regulation provide essential information about its efficacy.

The quality of the information available to managers and decision-makers in a compliance setting is crucial to an agency's ability to:[115]

- identify, analyse and prioritise risk;
- design and implement strategic and operational plans;
- make well-informed, reliable and consistent compliance decisions;
- assure stakeholders that the agency is meeting its regulatory objectives; and
- contribute effectively to the ongoing development of the policy and regulatory frameworks that define the agency's work.

In this context, good quality information is timely, reliable, consistent, comprehensive, accessible and is managed with integrity.[116] With these characteristics in mind, there is considerable justification for legal provisions for information, information management and information objectives to be given dedicated and ongoing attention in natural resources law. However, recent review of New Zealand's resource management system has seen failures of strategic design and operationalisation in this respect.[117]

[115] Department of Internal Affairs *Achieving Compliance* (2011), above n 97, at 102.

[116] At 103.

[117] Ministry for the Environment *New Directions* (2020), above n 97. For critical evaluation of the role of science in the policy-making process in New Zealand using the development of the National Policy Statement for Freshwater Management 2020 as a case study, see Deidre Koolen-Burke and Raewyn Peart *Science for Policy: The Role of Science in the National Policy Statement for Freshwater Management* (Environmental Defence Society, Auckland, 2022).

Depending on the activity (or resource use) subject to regulation, the amount of information required and its complexity varies significantly. Information complexity sometimes has direct bearing on regulatory design: for example, who is involved in regulation- or rule-making, and what information regulated parties might need to know.

In addition to resource-specific requirements to manage a natural resource, a regulatory scheme in which such requirements sit can reflect a broader array of environmental management goals. For example, regulators may be required to implement information-intensive management schemes such as broad-scale ecosystem management, adaptive management or ecosystem services protection often simultaneously while managing natural resources.[118] Regulatory agencies are often required to produce and acquire information relevant to their agency in addition to requiring it from regulated parties. For example, information may be required from one government agency in order to assist another governmental body in formulating regulation, related policy or to demonstrate accountability for agency mandates.

V Information and Natural Resources Management

Information is at the heart of natural resource decision-making. Information requirements in natural resources law are instrumental in assessing the practical, economic and legal feasibility of resource development and to measuring a resource developer's compliance with the natural resource bargain. As seen, information in natural resources law therefore has been concerned primarily with the objectives of the resource owner and resource developer. Furthermore, the value attached to resource information is usually relative to its utility in meeting the parties' economic objectives regarding the resource. This theme in natural resources law traditionally meant the interests of third parties were not represented in legal requirements for information in managing natural resource development. As demonstrated however, the advent of environmental law (including administrative and natural law aspects such as public participation in environmental decision-making) and the increasing legal recognition of Indigenous rights in the ownership and management of natural resources means that additional, new types of requirements for information are being incorporated into decision-making.[119] The

[118] Holly Doremus "Data Gaps in Natural Resource Management: Sniffing for Leaks along the Information Pipeline" (2008) 83 Ind. L.J 407-464 at 409.

[119] For example, the relationship between Local Authorities and the Waikato River Authority means new requirements for information, and its incorporation in decision-making under the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 s 58. See also for example, the promotion of bicultural frames of reference for research and development in policy, Ministry of Business, Innovation and Employment *Vision Matauranga: Unlocking the Innovation Potential of Maori Knowledge, Resources and People* (July 2007).

thesis provides examples and critiques of these under each regime examined. Environmental law has its own raft of information requirements which often overlay or are blended with natural resource law information requirements within a single statutory regime eg under the RMA. In other instances, separate environmental legislation can support a natural resource-specific statute such as occurs with the CMA. Broad themes regarding natural resource information that are associated with environmental law values typically concern information to assess environmental effects and sustainable resource management.

A Challenges with Information

"Natural resource information"—particularly science and technical information—raises challenges in natural resources management. When examining legal provisions for information and information processes it is useful to identify how information and knowledge are produced as part of the scientific process. In science, information is usually produced by acquiring and interpreting data. Data is accumulated to test or prove hypotheses or simply to learn about "what's out there". As more data and information are produced over time, knowledge in a given area can change thus producing another iterative cycle involving hypothesis, data accumulation and interpretation, information production and knowledge.[120] This section therefore considers information management processes and institutional (and other) capabilities and limitations regarding natural resource information acquisition and management. Information management (including knowledge acquisition and retention), the quality of science processes and the structure of institutions all feed into and influence policy- and regulation-making.

The well-being of modern society depends on its ability to generate knowledge and scientific evidence, to weigh the evidence and to make decisions informed by it.[121] However, scientific uncertainty is an inescapable aspect of natural resource management and decision-makers rarely have anything approximating perfect knowledge when making specific decisions.[122] Scientific certainty may come too late (if ever) to design optimal legal and policy responses. Thus, natural resources law's first question becomes how does one act in the face of uncertainty?[123] Further, because most natural resource challenges involve complex technical

[120] For a concise summary of the scientific method see Holly Doremus (environmental law scholar and biologist) in "Listing Decisions Under the Endangered Species Act: Why Better Science Isn't Always Better Policy" (1997) Wash U L R Q 1029 at 1057-1064.

[121] Shaun Hendy *Silencing Science* (Bridget Williams Books, Wellington, 2016) at 9.

[122] Rasband, Salzman and Squillace (2004), above n 3, at 43.

[123] At 43.

and economic issues and scientific (or environmental) uncertainty, a considerable amount of information must be generated before making decisions about resource allocation, use, and management. Therefore, many natural resource statutes require generation of considerable amounts of information to provide a surer basis on which to create policy.[124] Information is a limiting factor for natural resource policy and the regulatory system is ravenous for information[125], a hunger that is particularly acute in the context of natural resource regulation.[126] The need to anticipate and respond to environmental change makes natural resource management intrinsically more information-intensive than for example pollution control where the health effects that are of primary concern are not constantly changing.

While legal requirements for information in natural resources law relate to technical, economic, and scientific/environmental matters and particular property interests in natural resources, the information challenges identified here focus largely on challenges associated with scientific uncertainty because two—fisheries and geothermal resources—of the three resources examined in this thesis are classified as renewable resources requiring sustainable management. Hence, the information requirements to determine sustainable resource management are typically the most challenging, information-intensive and controversial. The legal information requirements examined for the non-renewable petroleum resource under the CMA typically relate to resource revenue calculation and to information about the resource's physical location and characteristic properties such as geological and geophysical information.[127] However, what is notable and a central feature in the management of geothermal, fisheries and petroleum resources, is that information about these subsurface resources is both difficult and costly to acquire.

The law has developed a number of responses to information challenges in natural resources law and environmental law. In environmental law, the precautionary principle is a legal attempt to mediate for the joint goals of natural resource exploitation and environmental protection.[128]

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[124] At 43-44.

[125] John S Applegate, "The Government Role in Scientific Research: Who Should Bridge the Data Gap in Chemical Regulation?" in Wendy Wagner and Rena Steinzor (eds) *Rescuing Science from Politics: Regulation and the Distortion of Scientific Research* (Cambridge University Press, Massachusetts, 2006) 255 and 262.

[126] Doremus (2008), above n 118, at 408.

[127] While environmental information requirements under the RMA and (for offshore development) the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 pertain to petroleum development operations, the thesis limits its focus to the provision of the CMA (and regulations).

[128] Black (2010) in Baldwin, Cave and Lodge (eds), above n 82, at 318-321.

In simple terms, taking a precautionary approach (a principle returned to in later chapters) means that any scientific uncertainty in understanding environmental effects should not be used as an excuse to avoid action to prevent harm.[129] This approach effectively shifts the burden of proof from those who would challenge an offending activity to those who wish to continue the activity.[130] This is a significant management strategy which in the case of some resources is relatively undeveloped in practice.[131]

Adaptive management is a practical manifestation of the precautionary principle. It is an experimental approach to resource management which relies on transparent disclosure of information, staged development and monitoring over time, with each stage being dependent on reviewed information.[132] Whether risk and information uncertainty will be sufficiently diminished for adaptive management to be consistent with the precautionary approach depends on the extent of risk and uncertainty remaining and the gravity of the consequences if that risk is realised.[133]

The law also tries to address imperfect knowledge in natural resource decision-making in an attempt to develop better information.[134] Professor Doremus has examined this issue of information in natural resources law with a focus on the processes by which information is supplied in natural resources policy. Her analogy of information flowing along a pipeline helpfully describes the many processes through which information must pass in the policy and regulatory setting whereby "focusing on the information supply pipeline helps move the discussion beyond the simplistic dichotomy of precaution versus certainty to the ways we can improve the information base for decisions".[135] While there is important scholarship regarding information needs, in recognising information as a limiting factor in decisions scholars have

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[129] Greg Severinsen "Bearing the Weight of the World: Precaution and the Burden of Proof under the Resource Management Act" (2014) 26 NZULR at 375-395.

[130] Rasband, Salzman and Squillace (2004), above n 3, at 44.

[131] Doremus (2008), above n 118. This can be problematic where experimentation, regulatory and scientific, occurs in isolation away from broader regulatory oversight, or where system-wide processes and standards do not exist; for example, about information-quality, or conflicts of interests among technical specialists.

[132] Jennifer Caldwell and others *Conditions of Consent* (paper presented in Resource Management Law Association Roadshow, July 2014). See also Hilke Giles and Barry Barton "Adaptive Management under the RMA: the Tension between Finality and Flexibility" (2020) 24 NZJEL 1-33.

[133] Dereck Nolan "The Coastal Environment" in Derek Nolan (ed) *Environmental and Resource Management Law* (5th ed, LexisNexis, 2015) at [5.65].

[134] For example, see the Environmental Reporting Act 2015; and information principles in the Fisheries Act 1996 s 10.

[135] Doremus (2008), above n 118, at 408.

long focused considerable attention on strategies for decision-making in the face of uncertainty. The importance of incentives for the production and disclosure of policy-relevant information has also been given attention. However, Doremus warns that as this body of work stands it ignores a crucial aspect of the information problem: the complex *processes* by which scientific and technical information are produced, expressed, transmitted and ultimately incorporated into decisions.[136] In seeking out "leaks in the pipeline" within legislative frameworks, regulatory systems and management tools for geothermal, fisheries and petroleum resource management, this thesis takes on part of this task by focusing attention on the legal requirements for information and on the information processes within these respective statutory regimes.

While information content may be subject to formal rules, it also may be affected by the ability of people involved in its day-to-day creation, interpretation, maintenance and processing.[137] Therefore, capability plays a large role in affecting content.[138] Individual capability, disciplinary and institutional capability and institutional knowledge and behaviour also affect information content and processes. Disciplinary knowledge has an important function in its specialisation; nevertheless, there are challenges associated with it in relation to information.[139] A discipline is restricted by both its existing ways of knowing and the parameters of the known within its own and other fields.[140] While it is an increasing function of academic disciplines to be aware of such limitations and to positively leverage off them, disciplines working in practice (within a government agency or a private company for example) may have less incentive to be aware of their disciplinary limitations. Any number of such examples might occur where information asymmetry exists between disparately (or differently) qualified groups.

One of the biggest barriers to the production and use of information is the landscape of isolated disciplinary silos confining researchers and managers. On the research side, those trained in

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[136] Doremus (2008), above n 118, at 413.

[137] Alexander Gillespie "Reliable Scientific Foundations: International Best Practice and the New Zealand Experience" (2017) 21 NZJEL 1-20.

[138] Productivity Commission (2014), above n 89, at 23, 119, 120, and 152. See also Office of the Prime Minister's Science Advisory Committee "Towards Better Use of Evidence in Policy Formation" (Sir Peter Gluckman's address to the Institute of Public Administration New Zealand/Institute of Policy Studies, Wellington, June 2011); and Office of the Prime Minister's Science Advisory Committee *The Role of Evidence in Policy Formation and Implementation: A Report* (September 2013).

[139] Regarding the policy development and the academic interface in New Zealand see Office of the Prime Minister's Chief Science Advisor *Enhancing Evidence-Informed Policy Making: A Report* (July 2017) at 15-18.

[140] See Bruce Pardy *Environmental Law: A Guide to Concepts* (Butterworths, Toronto and Vancouver, 1996); and Klaus Bosselman *When Two Worlds Collide: Society and Ecology* (R.S.V.P Publishing, Auckland, 1995).

established disciplines tend to see management problems through their particular disciplinary lens and to push whatever maximises the importance of their disciplines as universal solutions.[141] However, in government and academia there is increasing recognition of the value of interdisciplinary engagement and coordination across agencies.[142] Central government has made efforts to articulate information issues broadly and in natural resource management in New Zealand; moreover, research into the effectiveness of resource management has highlighted systemic challenges affecting information gathering and information-related processes.[143] Robust policy results from at least an awareness if not full incorporation of the disciplinarity involved in natural resource management. While a natural resource statute's information requirements may for example be limited for practical reasons within the natural resource bargain, a statute's wider intention should be linked to higher-level resource management goals. New Zealand has generally failed to set or achieve higher-level goals in its natural resource management, environmental and conservation statutes. The content of and linkages between information provisions and information management and environmental reporting have been a large part of this failure.

VI Key Points

This chapter positioned the research question firmly within a natural resources law framework which recognises the prominence of the natural resource bargain in natural resource law. It identified legal information requirements as primarily serving the property (or property-type) interests of parties within a bilateral bargain. The chapter questioned the function of property in natural resources and identified that this has historically served economic and individualistic ends primarily. The important inroads of Indigenous rights law and environmental law highlight the limitation of traditional natural resources law's narrow focus. Additionally, an enquiry into the public function of property in natural resources highlighted (and questioned)

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[141] Doremus (2008), above n 118, at 459.

[142] Richard Shaw and Christopher Eichbaum *Public Policy in New Zealand: Institutions, Processes and Outcomes* (3rd ed, Pearson Education, Auckland, 2011) at 91.

[143] Treasury *Environmental Risk Management in New Zealand – Is There Scope to Apply A More Generic Framework?* (PP06/06, 2006); Department of Internal Affairs *Achieving Compliance* (2011), above n 97, chapter 9; Office of the Prime Minister's Chief Science Advisor "The Place of Science in Environmental Policy and Law" (address by Sir Peter Gluckman to the Resource Management Law Association, Salmon Lecture, 2015); Ministry for the Environment and Department of Conservation *Conservation and Environmental Science Roadmap* (2016); Ministry for the Environment *National Monitoring System – Information Requirements* (2018); Marie A Brown, Raewyn Peart and Madeleine Wright *Evaluating the Environmental Outcomes of the RMA* (Environmental Defence Society, Auckland, 2016); and Parliamentary Commissioner for the Environment *A Review of the Funding and Prioritisation of Environmental Research in New Zealand* (December 2020).

the Crown's role in controlling property in natural resources in Aotearoa New Zealand. Regulation as a means of control and regulation- and policy-making as an ongoing forum in which the interests of parties play out both demonstrate and challenge control of natural resources.

Legal provisions for information were identified as central to both the function of the natural resource bargain and natural resource decision-making generally. Information procurement and processes highlight the complexity of information challenges in natural resource management. The chapter identified the constituent themes which feed into natural resource management broadly and central considerations in information needs.

Chapters three, four and five examine the law, regulation and regional policy for geothermal resource management as designed for large-scale geothermal resource exploitation in New Zealand. The content and function of legal information requirements for geothermal resource management and the regulatory process as it impacts resource information requirements are the particular focus. Overall, the geothermal chapters form the central case study for information-related challenges in natural resources law in this thesis. Information-related challenges in geothermal resource management are echoed in the ocean fisheries management regime explored in chapter six.

CHAPTER THREE

GEOTHERMAL RESOURCES LAW

I Introduction

Geothermal resources in New Zealand are managed under the Resource Management Act 1991 (RMA or the Act). As the first of three chapters on geothermal resource management, this chapter focuses on the application of RMA information provisions pertaining to both a regulator (regional council) and the exploiter of geothermal resources (resource consent/permit holder). The main statutory information provisions examined are found in ss 35, 35A and 108 and sch 4. The chapter shows how statutory information requirements are both substantively and procedurally fundamental to natural resource management under the Act. Particular information duties of the regional council are emphasised in ss 35 and 35A while the information duties of a consent holder come under s 108 and sch 4. In addition to statutory information provisions, the use of non-statutory information management tools such as "management plans" and "adaptive management" is also explained. The use of these tools and their underpinning concepts along with the core RMA information provisions above help to explain the development and application of geothermal-specific information provisions of regional policy and rules explored in chapter four.

The final geothermal chapter (chapter five) analyses regulation and regulatory processes, including the regulatory relationship in geothermal resource management between a regional council and a resource consent holder. Broadly, the three geothermal chapters' analysis considers the *function*, *content* and *operation* of information requirements and how they are formulated (and reviewed). Overall, the current chapter is foundational to understanding how the interests of parties in the geothermal resource bargain are met and how legal requirements for information facilitate their respective needs. The chapter helps answer the research question by providing the legislative and theoretical basis of the geothermal regional policy and information-related rules explored in the next chapter.

A *Māori and Geothermal Resources*

Geothermal phenomena are a taonga of great significance to Māori.[1] They form part of the Māori creation story, with physical manifestations of geothermal activity identified as the offspring of deities. Māori whakapapa links Māori to their gods through the natural world; hence, Māori see themselves as having a personal, physical and spiritual link to natural phenomena. Chief or priest, Ngatoroirangi is recognised by all the major central North Island iwi and hapu for bringing geothermal activity to Aotearoa from Hawaiki.[2] Thus, the Māori relationship with geothermal activity is conceptualised as an ancient one. The geothermal taonga and all its surface and subsurface manifestations are part of the cultural and spiritual identity of many North Island Māori.[3]

Māori own, manage and develop many geothermal resources in New Zealand for cultural purposes, tourism, industrial energy applications and electricity generation.[4] Māori ownership and management of certain geothermal areas and geothermal resources appropriated by the Crown under early colonial and public works legislation have resulted in Te Tiriti grievances which have been partially redressed under the Treaty Settlement Process.[5] Guided by the advice of the Waitangi Tribunal,[6] the Crown expresses commitment to providing recognition of Māori interests in geothermal resources and to continuing to develop mechanisms to redress

[1] See Waitangi Tribunal reports: *The Ngawha Geothermal Resource Report (Ngawha Report*) (Wai 304, 1993) at [2.4]; *Preliminary Report on the Te Arawa Representative Geothermal Resource Claims* (Wai 153, 1993) at 18; *He Maunga Rongo: Report on Central North Island Claims, Stage 1* (*Central North Island Claims, Stage 1*) (Wai 1200, 2008) (Vol 4) at 1502; *The Stage 1 Report on the National Freshwater and Geothermal Resources Claim* (Wai 2358, 2012) at [2.6.3]. See also Evelyn Stokes *The Legacy of Ngatoroirangi: Māori Customary Use of Geothermal Resources* (Department of Geography, University of Waikato, 2000).

[2] *Preliminary Report on the Te Arawa Representative Geothermal Resource Claims* (1993), above n 1, at 9.

[3] *Central North Island Claims, Stage 1* (2008), above n 1, at 1475-1503 and 1542.

[4] See Katherine Luketina and Phoebe Parson "New Zealand's Pubic Participation in Geothermal Resource Development" in Adele Manzella, Agnes Allansdottir and Anna Pellizzone (eds) *Geothermal Energy and Society* (Springer, 2019) at 201-203; and for example, Kevin McLoughlin, Aroha Campbell, and Greg Ussher "The Nga Awa Purua Geothermal Project, Rotokawa, New Zealand" (from proceedings World Geothermal Congress, Indonesia, April 2010).

[5] See Waitangi Tribunal reports, above n 1.

[6] Treaty of Waitangi Act 1975.

breaches of rights and interests.[7] However, the Tribunal has yet to report conclusively on the matter of Māori ownership of geothermal resources.[8]

Māori currently exploit geothermal resources for electricity generation both as sole owner/developers and as joint-venture partners with the state and so must adhere to the legal requirements for resource use and management.[9] Māori are also often the owners of land covering and surrounding geothermal resources. This circumstance has significance to private exploitation of the resource by a third party because a private access agreement is needed between a prospective developer and relevant Māori owner/s to develop and exploit the resource. Māori mana whenua (ownership of or association with land) surrounding geothermal resources and/or of geothermal resources is also significant for reasons specific to Māori geothermal resource kaitiaki (guardians).[10]

The current research examines RMA s 35A, the duty of regulators to keep records about iwi (tribe) and hapu (subtribe kinship group). Such information provisions are based on Te Tiriti principles and the legislative provisions for Māori in RMA Part II outlined below).

B Aotearoa's Unique Geothermal Resources

Geothermal energy is a term used in this study to indicate the part of the earth's heat that can be recovered and exploited for electricity generation or other industrial applications.[11] Large-scale geothermal energy development involves mining heat from high-temperature geothermal areas which are commonly close to the margins of tectonic plates. New Zealand's location on

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[7] Waitangi Tribunal *The Stage 2 Report on the National Freshwater and Geothermal Resources Claims* (Wai 2358, 2019) at [6.8].

[8] At [1.4.7]. See also RP Boast "Geothermal Resources Law in New Zealand: A Legal History" (1995) 6 Canta L R 1. Boast suggests that the historical narrative demonstrates that the common law has been of little relevance to geothermal resources because it is statutes that have counted beginning with the Thermal Springs Act 1881.

[9] See industrial development of geothermal resources by Maori in recent years in Ryan Roberts, Alan Brent and Jim Hinkley "Reviewing the Impacts of Community Energy Initiatives in New Zealand" (2021) 16 Kotuitui: New Zealand Journal of Social Sciences (online ed 1), 45-60 at 53-54; A Blair, PA Siratovich, and A Campbell "Geothermal Fuels Prosperity: How Geothermal Projects in New Zealand are Catalyzing Significant Socio-Economic Benefits for Māori" (paper from proceedings Congreo Anual, La Asociatcion Geotermica Mexicana, Mexico, 2018); and Brian White and Isabelle Chambefort "Geothermal Development History in the Taupo Volcanic Zone" (2016) 59 Geothermics 148 at [4] – [4.13].

[10] See *Central North Island Claims, Stage 1* (2008) (Vol 4), above n 1, at 1542.

[11] Mary Dickson and Mario Fanelli "What is Geothermal Energy" (Instituto di Geoscienze e Georisorse, CNR, Pisa, Italy, February 2004) at 1. Note a useful source of information about geothermal resource phenomena and exploitation, as well as international conference and workshop papers about geothermal resource management, is found at the International Geothermal Association website and open-access publications database at <www.geothermal-energy.org>; see also the International Energy Agency section for Geothermal Energy Development at <www.iea-gia.org>.

an active plate boundary between the Indo-Australian and Pacific Plates has resulted in the development of numerous geothermal systems which by worldwide standards comprise a significant geothermal energy resource. Geothermal systems occur in many parts of Aotearoa. Its high-temperature systems are located principally in the Taupo Volcanic Zone in the North Island, which extends from the eastern Bay of Plenty Region's Whakaari/White Island southwest of the Waikato Region to Mount Ruapehu.[12] Geothermal manifestations on such a scale as occurs in Aotearoa New Zealand are rare in the global context.[13]

New Zealand's geothermal systems are liquid-dominated. In a geothermal system, convected water occurring in a confined space in the upper crust of the earth transfers heat from a heat source to a heat sink—usually at the earth's surface.[14] In New Zealand resource management policy, a geothermal system is defined as an individual body of geothermal energy and water not believed to be hydrologically connected to any other and which includes material containing heat or energy surrounding any geothermal water and all plants, animals and other characteristics dependent on the body of geothermal energy and water.[15] Effectively, the extent of a geothermal system is the zone or volume in which effects of an activity within the system will likely occur. A geothermal system is usually thought of as an underground, connected body of water such that a pressure disturbance in one part of the body can be detected in the other parts of the body of the system. Each geothermal system is unique in aspects such as the hydrology, underlying and overlying geology and chemical compositions.

The three main elements of a geothermal system are a heat source, a permeable reservoir and a fluid.[16] Geothermal fluid may flow out on the surface, flow along subsurface paths laterally or simply flow diffusely laterally and dissipate into groundwater. Difficulties arise because the

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[12] Of New Zealand's 129 identified geothermal areas, fifteen range in the 220 degrees Celsius range, the temperature range for electricity generation, see New Zealand Geothermal Association website information at <www.nzgeothermal.org.nz>.

[13] Ronald F Keam, Katherine M Luketina and Leonie Z Pipe "Definition and Listing of Significant Geothermal Feature Types in the Waikato Region" (paper from proceedings World Geothermal Congress, Turkey, April 2005) at [1].

[14] Dickson and Fanelli (2004), above n 11.

[15] Waikato Regional Council *Waikato Regional Plan* (2007) glossary of terms "geothermal system" at <www.eplan.waikatoregion.govt.nz>.

[16] A geothermal reservoir is often the term for the physical location at which an industrial resource developer extracts geothermal fluid and steam via extraction wells. The geothermal system on which the reservoir sits usually extends beyond the reservoir.

boundary of a geothermal system is not a hard-and-fast line and its location varies with depth.[17] A geothermal field is a geographical definition usually indicating an area of geothermal activity at the earth's surface. In New Zealand, high-temperature geothermal fields are typically 12 square kilometres in area and spaced approximately 15 kilometres apart.[18]

New Zealand's high-temperature geothermal resources produce a mixture of water and steam (geothermal fluid). In effect, a geothermal resource developer gains access to a geothermal heat source. This heat convected via geothermal fluid is the extractible part of the resource. Extracting high-temperature geothermal fluid via extraction wells cools the underlying geothermally heated rocks and because heat conduction takes much longer than heat convection the heat recovery rate of a geothermal system occurs only slowly. In the case of electricity generation from a hydrothermal system, the rate of extraction of energy (heat) and geothermal fluid from an accessible reservoir generally far exceeds the natural recharge rate of the geothermal system. Temperatures generally decline in geothermal reservoirs as hot water is replaced by water flowing back into the reservoir; this can be a mixture of reinjected lower temperature water, cooled groundwater (typically flowing laterally from outside the system or downwards from shallower aquifers above the production reservoir) and hot geothermal water (which will be coming from a greater depth or laterally).[19] Geothermal extraction will also inevitably create pressure changes within the geothermal system. The extent of pressure decline in response to development depends upon the magnitude of extraction, the extent of in-system (human) re-injection and the rate of recharge water stimulated by the pressure decline.[20] Hot water recharge entering a geothermal system helps maintain the heat stored in the rock and replenishes the resource; thus, theoretically the greater the proportion of hot recharge to groundwater and/or injectate, the longer the productive life of the energy resource will be. However, because hot water recharge never makes up 100 per cent of recharge, rock temperatures and energy stored in the resource will always decline with time.[21]

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[17] *Geotherm Group Ltd and Others v Waikato Regional Council* (*Geotherm*) EnvC Auckland A047/2006 (13 April 2006) at [79]. See at [79] – [85] for an overview of geothermal system boundaries.

[18] New Zealand Geothermal Association website "NZ Geothermal Fields", above n 12. See further Colin JN Wilson and Julie V Rowland "The Volcanic, Magmatic and Tectonic Setting of the Taupo Volcanic Zone, New Zealand, Reviewed from a Geothermal Perspective" (2016) 59 Geothermics (Part B) at 168-187.

[19] *Geotherm*, above n 17.

[20] At [25] and [27].

[21] At [30].

1 *Electricity Generation*

In New Zealand a commercial geothermal electricity development accesses geothermal fluid by drilling wells typically 1000–3000 metres deep. A basic sequence of geothermal energy-processing stages in electricity production includes: extraction of fluid via production wells; treatment, where steam and water are separated and impurities are removed; use of steam to drive a turbine (or to supply process heat for direct applications such as timber drying); and disposal, where used fluids are typically reinjected via reinjection wells into the geothermal system.[22] The majority of geothermal heat utilised in New Zealand is for electricity production in high-temperature systems of between 200–350 degrees Celsius and electricity is generated via either flash steam or binary power plants.[23] The use of a geothermal system involves control of the interactive dynamic flows of energy and fluid through subterranean material with highly variable properties over areas of tens of square kilometres to depths of greater than five kilometres. This control requires input from many specialised technical disciplines, precise location of fluid takes and discharges and long-term planning and investment.

The duration of typical geothermal systems ranges from 5,000 to 1,000,000 years; over this period pulses of heat may pass through a system for a time with an area retaining heat continuously for longer periods. These conditions may lead to temperature fluctuations and hydrodynamic variations during a system's history. Over a million-year period, erosion, deposition and tectonic processes may also affect a geothermal system's hydrology. On a geological timescale, high-temperature, individual geothermal systems are essentially ephemeral.[24] However, excessive human interference in the form of heat extraction activities can severely deplete the heat and fluid reserves within a geothermal system; consequently, natural recovery of a system may take tens or hundreds of years. Thus, although the geothermal

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[22] Regional policy for geothermal resources requires reinjection of produced geothermal fluid in most cases. See Chris Bromley "New Zealand Geothermal Progress: Celebrating Success through the Test of Time" (from proceedings New Zealand Geothermal Workshop, November 2014) at [2].

[23] Flash steam power plants pull deep, high-pressure hot water into lower-pressure tanks, using the resulting steam to drive turbines (the largest examples of which are located at Wairakei and Kawerau development plants). Binary plants pass lower-temperature geothermal water by a secondary fluid with a much lower boiling point than water, which causes the secondary fluid to "flash" into vapour, driving turbines. For an overview of electricity developer companies, details of their operations, and direct use applications in New Zealand see New Zealand Geothermal Association website information "NZ Geothermal Fields", above n 12.

[24] Waikato Regional Council *Waikato Regional Policy Statement* (2000) at [3.7.1]. Note the first-generation *Waikato Regional Policy Statement* (2000) was updated in 2007 by Regional Policy Statement Change No.1 (Geothermal). Current Waikato regional policy and rules no longer contain such descriptions of the geothermal resource nor information on geothermal resource renewability or its susceptibility to heat and pressure decline with exploitation; see further herein, chapter four.

energy resource is considered a renewable resource, its renewability is on a far longer timescale than other renewables such as hydro, tidal or wind resources. Accordingly, compared to other energy resources, geothermal resources have particular requirements for sustainable management, a definition which is both resource-specific and geothermal-system-specific depending upon the natural characteristics of the particular geothermal system and on the rate of geothermal fluid extraction from it. The most critical factor for the classification of geothermal energy as a renewable resource is the rate of energy recharge. In the exploitation of geothermal systems, energy recharge takes place by advection of thermal water on the same timescale as production from the resource.[25] The energy withdrawn from a geothermal system through large-scale extraction far exceeds its natural recharge rate which is why geothermal systems usually take many decades to recover.

Prior to the RMA, large-scale extraction of geothermal fluid led to the demise of geysers in some cases and many significant geothermal features (geysers, springs, sinter deposits, mud pools and their rare ecosystems) were destroyed or extensively modified. For example, early state-led electricity developments on the Wairakei-Tauhara and Ohaaki geothermal systems destroyed all known sinter depositing springs and geysers in the area and caused adverse effects on overlying structures (in the built environment) and other natural and physical resources, including land subsidence, hydrothermal eruptions and increases in concentrations of contaminants in the Waikato River.[26] Extraction of geothermal fluid can increase the rate of steam discharge. It increases land instability which leads to hydrothermal eruptions, landslides and tomos (caves). The following chapter discusses rates of resource exploitation and renewability of geothermal resources further in the context of sustainable management under the RMA and regional policy and rules.

II Geothermal Energy Law 1952–1991

The first legislation for geothermal energy development was the Geothermal Steam Act 1952[27]; this was soon repealed by the broader Geothermal Energy Act 1953 (GEA).[28] The GEA

[25] Dickson and Fanelli (2004), above n 11, at 1.

[26] *Waikato Regional Policy Statement* (2000), above n 24, at [3.7.1] and [3.7.2.1].

[27] In essence the Geothermal Steam Act 1952 nationalised use rights in geothermal resources insofar as electricity generation was concerned. See *Ngawha Report* (1993), above n 1, at [7.3.3]. For a history of early legislation for geothermal resources see Richard Boast *The Legal Framework for Geothermal Resources: A Historical Study* (report to the Waitangi Tribunal, 1991); Tom Bennion *New Zealand Law and the Geothermal Resource* (report to the Waitangi Tribunal, 1991); and Boast (1995), above n 8.

[28] For a comprehensive history of geothermal development for energy production in New Zealand see John Martin *People, Politics and Power Stations: Electric Power Generation in New Zealand 1880-1998* (Electricity

represented the national development ethic of the 1950s which promoted economic growth and "progress", including national security of energy supply.[29] Key parts of the Act included a broad definition for geothermal energy,[30] provision for the proclamation of geothermal energy areas and provision for licence rental charges for the use of geothermal energy.[31] The licensing provision allowed private development (although the majority of electricity production at the time was carried out by the state). It required all persons to obtain a licence from the relevant Minister, but with exceptions. A licence was not required for any survey, investigation, test or measurement lawfully carried out or for any domestic purpose. The Act also exempted the state from requiring a licence to develop electricity and (again) allowed compulsory acquisition of land and geothermal resources in the "national interest".[32] There was no recognition of Māori interests in geothermal resources under the GEA; however (with no specific reference to Māori or to Te Tiriti o Waitangi), pre-existing uses of geothermal energy were recognised.[33] Although the GEA was amended several times, its structure remained essentially unchanged until it was almost wholly repealed by the RMA.[34]

Corporation of New Zealand, and Historical Branch, Department of Internal Affairs publication, Bridget Williams Books, 1991).

[29] For a review of New Zealand's state ownership and development of energy resources to commercial privatisation see Barry Barton "From Public Service to Market Commodity: Electricity and Gas Law in New Zealand" (1998) 16 Journal of Energy and Natural Resources Law 351-388.

[30] GEA 1953 s 2 geothermal energy is defined as "energy derived or derivable from and produced within the earth by natural heat phenomenon; and includes all steam, water, and water vapour, and every mixture of all or any of them that has been heated [by such energy], and every kind of matter derived from a bore and for the time being with or in any such steam, water, water vapour, or mixture; but does not include water that has been heated by such energy to a temperature not exceeding 70°C." Geothermal energy was classified similarly to the water resource. This aligned with the common law stance of the Water-Power Act 1903 s 2(1) which gave the Crown the sole right to use water for electricity generation. The legislative framework linked geothermal resources with water rather than with other energy resources such as petroleum or coal. See evidence of Richard Boast (counsel for the claimants) in *Ngawha Report* (1993), above n 1, at [7.3.6] and [7.4.1].

[31] GEA 1953 ss 2, 4, 8 and 10.

[32] GEA 1953 ss 7 and 11. Compensation was payable for loss or damaged suffered by the Act s 13; however, it was not payable unless "at the commencement of the Act, it was of actual benefit to the owners or occupiers of the surface land" s 14. See further *Ngawha Report*, above n 1, at [7.4.6]. Despite legislative provision for the making of regulations (GEA 1953 s 16) geothermal energy regulations were not passed until 1961; see Geothermal Energy Regulations 1961.

[33] GEA 1953 s 9(1)(b) and (c). See further *Ngawha Report*, above n 1, at [7.3.5]; and Tom Bennion "Waitangi Tribunal Central North Island He Maunga Rongo Report Part V" (2008) Māori LR at 4-6.

[34] Parts of the Geothermal Energy Regulations 1961 concerning health and safety matters remain in force and are administered by the Ministry of Business, Innovation and Employment; Geothermal Energy Regulations 1961 Order in Council note and cl 2(1); WorkSafe New Zealand Act 2013 s 2; Crown Entities Act 2004 sch 1. For an overview of legislation concerning geothermal resources prior to the passing of the RMA, see Ministry of Energy, Oil and Gas Division *A Review of the Role of Geothermal Resources in New Zealand* (1982) at [6].

A Legislative Reform for Geothermal Resources – The State's Changing Role

Before the enactment of the RMA, management of geothermal resources was divided between the Ministry of Energy and regional water catchment boards. The Ministry of Energy controlled allocation of geothermal energy through the grant of use licences under the GEA. Regional bodies oversaw environmental externality aspects in the granting of water permits under the Water and Soil Conservation Act 1967 (WSCA) and took an active interest in management through involvement in the preparation of geothermal water management plans.[35] However, the WSCA lacked legislative backing for geothermal water management plans prepared by the catchment boards.[36] Having no public participation process, no provision for the preparation of management plans or policies, limited guidance by way of criteria for decision-making and (as noted) no recognition of Māori rights in geothermal resources, the GEA did not provide for comprehensive geothermal resource management.[37]

In 1988 as part of a wider review of resource management law reform, the Ministry for the Environment and the government formally acknowledged the need for geothermal resource law reform.[38] Subject to statutory provisions protecting the interests of the Crown such as the right to make rental charges[39] and the Crown's vesting-rights over the geothermal resource for energy development,[40] the GEA was (almost wholly) repealed. The RMA came into force with the objective to restate and reform the law relating to the use of land, air and water[41] and to provide a new framework for environmental management. Since 1991 therefore, geothermal resource management law, policy and regulation have been developed and carried out by regional authorities within the RMA's legislative framework.[42]

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[35] Richard Boast "Geothermal Energy: Māori and Related Issues" (Resource Management Law Reform, Working Paper 26, 1989) 18-20 and appendix 6.3.

[36] See *Keam v Minister of Works and Development* [1983] 1 NZLR 319.

[37] MW Davenport *Geothermal Management Planning: An Overview* (technical report for Waikato Valley Authority, 1987) at 63. See also for example RF Keam (ed) "Geothermal Systems: Energy, Tourism, and Conservation" (1982) (from proceedings Nature Conservation Council, Rotorua, October 1981).

[38] Resource Management Bill 1989 (224-1) (explanatory note).

[39] RMA 1991 s 360(1)(c)(iv). A royalty regime established under the GEA 1953 continued with the passing of the RMA 1991; and Resource Management (Transitional Fees, Rents, and Royalties) Regulations 1991 part 3. This scheme only applied to the Rotorua field (primarily as a resource management tool to modify resource depletion rates); see *Ngawha Report*, above n 1, at [7.4.5]; see also White and Chambefort (2016), above n 9, at [3.7].

[40] RMA 1991 s 354(1)(a).

[41] RMA 1991, long title.

[42] Note in the early days of geothermal management under the RMA 1991 the Waitangi Tribunal discussed the impact on Māori of the transfer of management from central government to regional councils; particularly in

III Resource Management Act 1991

The RMA provides for the sustainable management of natural resources in New Zealand.[43] Through a system of integrated environmental management, the Act integrates normative environmental principles (such as sustainable management of the natural environment) with strategic policy-making and operational procedures (such as regulatory enforcement and resource permitting).[44] The Act contains both exploitative and protective and micro-environmental and macro-environmental elements and is part of a legislative trend to state broad principles of purpose and national policy rather than prescribe detailed rules.[45] Resource management functions are divided between central government and regional or territorial authorities.[46] Most strategic and operational environmental management is carried out by regional councils which prepare and promote regional strategy via regional policy statements (RPS or policy), regional plans (plan) and district plans.[47]

As set out in the Act, the broad contents of an RPS require regional policy to focus primarily on significant environmental issues within regions and on objectives and methods to manage them.[48] Therefore, policy for geothermal resources is found in the RPSs of the Waikato, Bay of Plenty and Northland regions—the only New Zealand regions with high-temperature geothermal resources and where all large-scale geothermal resource development occurs. Environmental and strategic objectives are carried out through regional plan rules which have the force of law. Rules must give effect to regional policy and national environmental policy and are based on the broad environmental management duties and restrictions regarding

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regard to plan preparation and the requirement of royalty payments from users of geothermal resources; see *Ngawha Report* (1993), above n 1.

[43] RMA 1991 s 5(1) and (2).

[44] David Grinlinton "*The Context of Environmental Law"* in Salmon and Grinlinton (eds) *Environmental Law in New Zealand* (Thomson Reuters, 2018) at 69-73. Integration mechanisms include processes for independent audit, critical evaluation and proposals for reform; see David Grinlinton "Integrating Sustainability into Environmental Law and Policy in New Zealand" Klaus Bosselmann, David Grinlinton and Prue Taylor (eds) *Environmental Law for a Sustainable Society* (2nd ed, New Zealand Centre for Environmental Law Monograph Series, Vol 1, 2013) at 26 and 32.

[45] Kenneth Palmer "The Sources of Environmental Law" in *Environmental and Resources Law in New Zealand* Derek Nolan (ed) (5th ed, LexisNexis, 2015) at [2.8] and [2.21].

[46] RMA 1991 Part IV.

[47] RMA 1991 Part V, ss 59, 63 and 72. Note regional plans, unlike regional policy statements and district plans, are not mandatory under the Act, see s 65(1). Implications of this are noted in the following chapter, regarding regional variations in plans' rules for geothermal resource management.

[48] RMA 1991 s 62.

activities affecting the environment set out in the Act.[49] Such duties and restrictions relate to various parts of the natural environment such as land, water (including geothermal resources), air and coastal environments. Rules set out in mandatory district plans operate by further classifying activities which impact the environment; where certain activities may be permitted, rules operate by prescribing methods to achieve sustainable management of the environment through a resource permitting process. Hence, a potential resource user must make an application to the relevant regulatory authority for a resource-use permit, typically known (under the RMA) as a "resource consent".[50] Water and geothermal resources are allocated for use and development on a first-come, first-served basis under the RMA.[51]

A Sustainable Management under the RMA 1991

The strategic and operational management structure prescribed by the RMA empowers regional authorities to fulfil functions and responsibilities to achieve the Act's overall purpose of sustainable management of natural, physical and geothermal resources.[52] Section 5 of the Act defines sustainable management as:[53]

> [M]anaging the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—
>
> (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
>
> (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
>
> (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

[49] Legal provsions about renewable energy development also include, for example, RMA 1991 s 7(b), (ba), (g) and (j) and s 104(1)(b).

[50] In New Zealand a resource-use permit for land use under the RMA 1991 is called a "resource consent", while permits related to the use or discharge of water (including geothermal resources) or discharges to air, are called "permits". For the present study and unless stated otherwise "resource consent" is used generically to include all the permissions making up the bundle of consents and permits required by a resource developer in order to generate electricity from geothermal resources.

[51] *Fleetwing Farms Ltd v Malborough District Council* [1997] 3 NZLR 257 (CA). For a legal history of New Zealand's water allocation policy and its development both before and after the passing of the RMA 1991 see Jadeepkaur Singh-Ladhar *Water Allocation Law in New Zealand: Lessons from Australia* (Routledge, 2020).

[52] RMA 1991 s 5(1) and (2).

[53] RMA 1991 s 5(2)(a) – (c). For commentary on the origins and application of sustainable management under the RMA see generally Bosselmann, Grinlinton and Taylor (eds) (2013), above n 44; and Klaus Bosselmann "Sustainability and the Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (2nd ed, Thomson Reuters, 2018) at 75-106.

The management function of this definition anticipates both utilisation and protection of resources where "management" is qualified by a strong ecological function incorporating a responsibility to sustain the potential of resources to meet the needs of future generations (intergenerational equity).[54] In this definition, the purpose of sustainable management means that neither "use and development" on the one hand nor "protection" on the other is necessarily to prevail.[55] A definition of sustainable management where social, economic and ecological concerns are balanced equally is referred to in international literature as "weak sustainability" and constitutes a pragmatic, anthropocentric model of interpretation.[56] Regulatory policy for geothermal resources in New Zealand recognises this weak sustainability paradigm whereby some geothermal resources are classified for large-scale exploitation.

The RMA defines geothermal resources as a renewable resource.[57] However, compared to other renewable resources listed in the RMA, (solar, wind, hydro, biomass, tidal, wave and ocean current sources), the timeframe for geothermal resource renewability is on a far greater timescale than other renewables which take days or weeks to renew.

Decision-makers under the RMA must have particular regard to the benefits to be derived from the use and development of renewable energy.[58] National Policy Statements such as for the Development of Renewable Electricity Generation (2011) and for Freshwater Management (2020) also must be taken into account in decision-making under the RMA.[59] The Energy Efficiency and Conservation Act 2000 which promotes energy efficiency, energy conservation and the use of renewable sources of energy also lists the sustainability principles found in the RMA.[60] In the next chapter legal information requirements developed in regional policy and plans for geothermal resource management are assessed against RMA s 5.

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[54] Grinlinton (2013), above n 44, at 28-29.

[55] Kenneth Palmer "Resource Management Act 1991" in Derek Nolan (ed) *Environmental and Resource Management Law in New Zealand* (5th ed, LexisNexis, 2015) at [3.23].

[56] Kenneth Palmer "Introduction to Environmental Law" in Derek Nolan (ed) (2015), above, at [1.12].

[57] RMA 1991 s 2(1).

[58] RMA 1991 s 7(j).

[59] For a comprehensive survey of national- and regional-level law and policy considerations for geothermal resource management (including for territorial authorities and district councils) see D Kissick, M Climo and B Carey *An Overview of New Zealand's Geothermal Planning and Regulatory Framework* (report produced for *Geothermal: The Next Generation* by Traverse Environmental Ltd, August 2021).

[60] Energy Efficiency and Conservation Act 2000 s 6.

B RMA 1991 Treaty Principles

The RMA is the principal environmental statute of general application to give statutory force to the customary interests and values of Māori in natural and physical resources.[61] Part II, ss 6, 7 and 8 recognise and protect matters of importance to Māori. Section 8 particularly incorporates the principles of Te Tiriti o Waitangi:[62]

> In achieving the purpose of [the RMA], all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Section 6 refers to matters of "national importance" which decision-makers under the Act "shall recognise and provide for"; these include:

> […]
>
> (e) the relationship of Māori and their culture and heritage and traditions with their ancestral land, water, sites, waahi tapu, and other taonga:
>
> (f) the protection of historic heritage from inappropriate subdivision, use, and development:
>
> (g) the protection of protected customary rights.

Under s 7(a) "other matters", Te Tiriti requires that decision-makers "shall have particular regard to" "kaitiakitanga". Kaitiakitanga is defined as:[63]

> the exercise of guardianship by the tangata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources; and includes the ethic of stewardship.

[61] Briar Gordon "Treaty of Waitangi and Māori Issues in Environmental Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (2nd ed, Thomson Reuters, 2018) at [8.5.3].

[62] Note a central objective of current resource management law reform is to "give effect to" the principles of Te Tiriti o Waitangi, rather than (as currently stated in s 8) to "take into account" the principles; see further Ministry for the Environment *Natural and Built Environments Bill: Parliamentary Paper on the Exposure Draft* (June 2021) at 9.

[63] RMA 1991 s 2(1). Mana whenua means (s 2(1)) in relation to a particular area, the iwi or hapu that holds mana whenua over that area. See also the thesis Glossary of Māori Words.

In conjunction with s 5,[64] these are the central provisions pertaining to Māori under the Act and it is from this statutory basis that the information requirements of s 35A, "Duty to keep records of iwi and hapu" flow.[65]

Finally, it is useful to note that the RMA focuses on natural resource planning, use and allocation rather than on matters of resource ownership.[66] Legal scholars argue that the interpretation of the Treaty principles under the RMA allow for a "right to culture" model of Indigenous rights recognition which emphasises the protection of a traditional way of life, procedural rights to consultation and tribal self-management of property rather than a "right to property" or "tino rangātiratanga" (self-determination/absolute authority) model.[67]

IV Resource Consenting – An Overview

Where most accounts of the RMA sequentially turn to the function of regional policy and plans, the current research turns to the resource consent process because these insturments are the subject of the next chapter and so are reviewed in detail.

A resource consent is developed following formal RMA processes and requirements for information; however, flexibility is built into the process and into the resource consent agreement regarding for example later adjustments to consent conditions and the development and adjustment of management plans. Part III of the RMA[68] classifies activities relating to the use of natural and physical resources. The duties and restrictions Part III specifies determine when a resource consent will be required and what activities must be regulated through subsidiary RMA instruments.[69] Part III s14—restrictions relating to water—includes the use of heat and energy from water and the use of heat and energy from material surrounding

[64] The RMA 1991 s 5 definition of sustainable management includes "enabling people and communities to provide for their social, economic and cultural wellbeing" and by implication this includes Māori.

[65] Note RMA 1991 s 35A has important links with ss 58L – 58U, Mana Whakahono o Rohe: Iwi Participation Arrangements however these are not explored in the present research.

[66] While resource consents and water permits have property-like characteristics, the above comment is made in order to identify that Māori ownership interests are intentionally avoided under the Act. See Gordon (2018), above n 61, at [8.5.3].

[67] Sir Edward Taihakurei Durie, Dr Robert Joseph, Dr Andrew Erueti and Dr Valmaine Toki *Nga Wai o Te Māori: Nga Tikanga me Nga Ture Roia The Waters of the Māori: Māori Law and State Law* (paper prepared for the New Zealand Māori Council, January 2017) at [202], see also at [152] and [158].

[68] RMA 1991 ss 77A and 77B.

[69] For example, these include national environmental standards, national policy statements, and regional policy and plans.

geothermal water.[70] Section 2(1)(a) defines water as "water in all its physical forms whether flowing or not and whether over or under the ground", while (b) includes "fresh water, coastal water, and geothermal water". Geothermal water and geothermal energy are defined as: [71]

> water heated within the earth by natural phenomena to a temperature of 30 degrees Celsius or more; and includes all steam, water, and water vapour, and every mixture of all or any of them that has been heated by natural phenomena [and geothermal energy is] energy derived or derivable from and produced within the earth by natural heat phenomena; and includes all geothermal water.

Following on from the activity classifications of Part III, regional or district plans show whether a classified activity requires a resource consent (or permit) and Part VI sets out the resource consent process.[72] The processing and adjudication of resource consent applications is an important function for regional authorities and one of the key instruments for achieving sustainable management under the Act.[73] Any person can apply to a relevant regional authority for a resource consent,[74] and resource consents are issued on a first-in-time basis.[75] Applications must be in a prescribed form and must include an assessment of environmental effects (AEE) which may result from intended resource use.[76] As noted, the early decades of electricity production from geothermal resources in New Zealand produced adverse environmental effects and caused resource degradation and the subsidence of land surrounding

[70] RMA 1991 s 14(2)(b) and (c). In relation to geothermal water, water, heat or energy may be taken if it is in accordance with tikanga Māori for the communal benefit of the tangata whenua of the area and it does not have an adverse effect on the environment; see Grant Hewison "The Resource Management Act 1991" in David Grinlinton and Peter Salmon (eds) *Environmental Law in New Zealand* (2nd ed, Thomson Reuters, 2018) at [11.5.4].

[71] RMA 1991 s2(1).

[72] RMA 1991 ss 87AA – 139A, and sch 4.

[73] Kenneth Palmer *Local Authorities Law in New Zealand* (Brookers, 2012) at 861 [18.1]; and Matthew Casey "Land Use" in *Environmental Law in New Zealand* Peter Salmon and David Grinlinton (eds) (Thomson Reuters, 2018) at [12.2].

[74] RMA 1991 s 88.

[75] *Fleetwing Farms Ltd v Marlborough District Council* W101/97 [1997] EnvC 362 (26 November 1997); *Fleetwing Farms Ltd v Malborough District Council* [1997] 3 NZLR 257 (CA). See also development of the first-in-time precedent, in *Geotherm Group Limited v Waikato Regional Council* (2002) 9 ELRNZ 75 (EnvC); *Aoraki Water Trust v Merdian Energy* [2005] NZLR 268 (HC); *Central Plains Water Trust v Ngai Tahu Properties* [2008] NZCA 71; (2008) 14 ELRNZ 61; [2008] NZRMA 200; and *Southern Alps Air Ltd v Queenstown Lakes District Council* [2010] EnvC 381: ENV-2006-CHC-7, (8 November 2010). For discussion of resource allocation in resource consents under the RMA 1991 see Kenneth Palmer "Priority of Competing Resource Consent Applications – Marginalisation of the Sustainable Management Purpose" (2008) 7 Resource Management Bulletin 11, 133-137.

[76] RMA 1991 ss 88(2)(b) and 104(1) and sch 4.

resource extraction areas, including areas of cultural significance to Māori.[77] Other examples of adverse environmental effects resulting from geothermal resource exploitation can include groundwater contamination, noise and air pollution, destruction of or damage to geothermal surface features and ecosystems and damage to overlying (built) structures.

An AEE usually corresponds with an activity's scale and the significance of its environmental impact.[78] "Effect" has a broad definition and includes positive and adverse effects, temporary or permanent effects occurring at any time, cumulative effects—regardless of the scale, intensity duration or frequency of the effect—, any potential effect of high probability and any potential effect of low probability which has high potential impact.[79] The RMA information requirements for the AEE are also subject to the provisions of relevant regional policy and plan rules and must also include for example effects on resources having cultural, aesthetic or historical value.[80] Crucially, an applicant's AEE also guides the development and monitoring of resource consent conditions. While there is generally no independent audit of an AEE external to the overall review by a resource consenting authority under the Act, an authority may commission an external review.[81] Public notification of a resource consent application and determination of some applications by the Environment Protection Authority (EPA, central government) may provide opportunities for wider scrutiny of an AEE.[82] Matters that must be addressed by an assessment of environmental effects include "any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present and future generations".[83]

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[77] See for example, Evelyn Stokes *Ohaaki: A Power Station on Māori Land* (Te Matahauariki Institute Monograph Series, Dept of Geography, University of Waikato, 2004).

[78] RMA 1991 s 88(2)(b) and sch 4 cls 6 and 7. For a discussion of environmental effects and sustainability, see Allison Arthur-Young "Environmental Assessment" in Derek Nolan (ed) *Environmental and Resource Management Law in New Zealand* (5th ed, LexisNexis, 2015) at [18.9].

[79] RMA 1991 s 3.

[80] RMA 1991 sch 4 cl (6)(2) and cl (7)(1)(a) and (d).

[81] Generally, under the RMA external review of a resource consent applicant's AEE only rarely occurs. For criticism of and recommendations for the improvement of the RMA AEE see David Grinlinton "Access to Environmental Justice in New Zealand" (1999) ActaJuridica 80 at 85-88; and Grinlinton (2013), above n 44, at [3]. Note the Resource Management Amendment Act 2013 (2013 No 63) replaced the former RMA 1991 sch 4 with more prescriptive information requirements for AEEs.

[82] However, depending on whether the public is informed about the particular environmental, legal or other issues at play regarding an applicant's AEE, public participation in, or EPA decision-making of the application, does not necessarily guarantee the critical review of an AEE.

[83] RMA 1991 sch 4 cl 7(1)(d).

Determinations whether to grant resource consent must consider s 104's matters, such as national environmental standards, national and regional policy, environmental effects and any other matter an authority may consider relevant and reasonably necessary to determine the application (for example the Part II provisions listed above).[84] Before deciding whether to grant a resource consent, a consenting authority may request further information relating to an application.[85] Failure to provide sufficient or accurate information can result in an application's being rejected or declined.[86]

A Geothermal Resource Consent Applications

There is no exclusive exploration licence for geothermal resource use under the RMA.[87] A developer of a new area undertaking exploration must make private arrangements with landowners under civil law to secure access to the resource. The process of preparing a resource consent application can take a year or more and requires preparation of a project description and the AEE. On lodgment of a resource consent application, a limited or publicly notified hearing may take place; the processing of the application may take six months to a year. Amendments to the Act removed the general discretion to publicly notify resource consent applications thereby significantly eroding the public participation emphasis as originally enacted under the RMA.[88] Public notification considerations for a geothermal resource consent application may include considerations such as whether the applicant requests public notification; whether a rule or national environmental standard requires notification; whether the activity will or is likely to have adverse effects on the environment that are more than minor; and whether "special circumstances" exist.[89] Limited notification may also be made in cases

[84] Regarding the High Court's application of RMA 1991 Part II considerations by decision-makers see *New Zealand Rail Ltd v Marlborough District Council* [1994] NZRMA 70 (HC); and *Environmental Defence Society Inc v The New Zealand King Salmon Co Ltd* [2014] NZSC 38, [2014] 1 NZLR 593. Generally, the RMA definition for environment (and that of the Environment Act 1986) integrates many facets that comprise the concept of environment – the "New Zealand model" – in which economic values co-mingle with ecocentric values, including sustainability and guardianship, see Klaus Bosselmann *When Two Worlds Collide* (R.S.V.P. Publishing Co Ltd, Auckland, 1995) at 130-133.

[85] RMA 1991 s 92.

[86] RMA 1991 s 88(3) and 104(6).

[87] Note a resource consent for an exploration licence can be granted under the RMA 1991 but it does not automatically guarantee a right of development.

[88] See RMA 1991 ss 95–95F; and Resource Management (Simplifying and Streamlining) Amendment Act 2009 (2009 No 31); Resource Legislation Amendment Act 2017 (2017 No 15); and Resource Management Amendment Act 2020 (2020 No 30). See further D Kirkpatrick and B Carruthers *Environmental and Resource Management Law* (online ed) at [4.51].

[89] At [4.51].

where there is an affected protected customary rights group; where the consent authority determines there are affected persons; and where special circumstances exist.[90]

Typically, the three main types of resource consents for geothermal energy operations are: land use consents, for activities such as excavation, construction and well-drilling; water permits for the use of geothermal fluid and ground water; and discharge permits, both to the air, and for fluid such as used geothermal fluid and cooling water. Geothermal and ground water use and discharge permits are usually issued for a maximum consent time-period of 35 years,[91] thus giving an electricity developer greater certainty of long-term operation. As resource consent application and re-application (consent renewal) are also costly and time-consuming, a maximum time-period for water-related permits allows costs to be absorbed and for a useful amount of monitoring data to be accumulated in order to assess long-term environmental effects. A large-scale geothermal development could have more than 15 resource consents for various activities and resource consents documents can be between 30 and 60 pages in length.[92] The cost of the consenting process depends on the scale of the proposed development, the likely adverse effects and the number of parties affected by the application. Resource consent application costs can range from NZD 150,000 to 250,000 for a straightforward project to several millions of dollars for complex, large-scale applications.[93]

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[90] At [4.52].

[91] RMA 1991 s 123(a) – (c) land use consents usually have an unlimited duration, although exceptions apply. For an authoritative source on New Zealand water law, see Trevor Daya-Winterbottom "Water Management" in *Environmental Law in New Zealand* Peter Salmon and David Grinlinton (eds) (2nd ed, Thomson Reuters, 2018) at [13.7.1].

[92] Katherine Luketina "New Zealand Geothermal Resource Management – A Regulatory Perspective" (from proceedings World Geothermal Congress, Japan, May 2000) at [10.1]. Cover pages show basic information such as the consent number and applicant name, consent type and duration, and the volume of water consented to (in metric tons) per year and/or per day. Consent conditions are listed on the following pages (usually between two to eight pages). Following this, the main body of a geothermal resource consent contain general conditions tailored to consent holders individually, containing specifications for system management plan modelling and reporting; resource monitoring; peer review panels; and administrative matters, such as resource consent review periods and administrative charges. Schedules are usually attached to resource consent documents containing eg; maps of the consented area; a system-monitoring program; and a list of chemicals used in well maintenance. The system monitoring program typically covers monitoring lists for; the type of extraction wells, monitoring wells, including ground water wells and injection wells; ground level monitoring, for subsidence; monitoring for surface heat flows, surface discharges, streams, flora and fauna; and monitoring for microgravity and seismicity.

[93] John Burnell and others "Sustainability of TVZ Geothermal Systems: the Regulatory Perspective." (2016) Geothermics 59 (2016) 10 at [3.4]. Note some geothermal development projects can be in excess of NZD 1 billion. See for example Contact Energy Ltd's development of the Tauhara geothermal system in Environment Protection Authority *Final Report and Decision of the Board of Inquiry into the Tauhara II Geothermal Development Project* (Vol I) (December 2010) at [169].

B Resource Consent Conditions

Under s 108, a consent authority may prescribe resource consent conditions which are generally proportionate to the kind of consent required and any resulting environmental effects.[94] A resource consent and its conditions constitute both benefits and burdens to a consent holder.[95] In effect, a resource consent is an agreement—the "bargain" between the resource owner and the resource developer. Consent conditions prescribe how core terms of the bargain must be kept. A consenting authority has wide discretion to prescribe conditions for the use, development and management of resources A resource consent may be granted on any condition that the consent authority considers appropriate.[96] However, an authority's discretion is not unbounded.[97] For conditions to be valid, they must be for a resource management purpose, relate fairly and reasonably to the consent application, not be so unreasonable that no reasonable authority could have given approval and must not unlawfully delegate a consent authority's duties.[98] These constraints on condition-making focus on the exercise of power following administrative law principles.[99] Such condition-making requirements focus on maintaining standards which ensure conditions such as standards for clarity and specificity in the wording of condition documents[100] are achievable for the consent holder. Other areas might include deciding on the suitability of independent auditing of conditions or the role of

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[94] RMA 1991 s 108 – 108AA.

[95] *Maraetai Road Ltd v Auckland Council* [2014] EnvC 105 at [20]. See Greg Severinsen "Glass Half Empty or Glass Half Full: Adverse Effects, Positive Effects and Conditions under the Resource Management Act 1991 and Resource Legislation Amendment Bill 2015" (2016) 11 RMB 110.

[96] RMA 1991 s 108(1).

[97] *Newbury District Council v Secretary of State for the Environment* [1980] 1 All ER 731 (HL) applied in *Housing New Zealand Ltd v Waitakere City Council* [2001] NZRMA 202 (CA).

[98] The Supreme Court has taken a liberal view of "fairly and reasonably relate to the resource consent" holding that a condition must be logically connected to the development but does not need to be required for the purposes of development *Waitakere City Council v Estate Homes Ltd* [2007] 2 NZLR 149. However, the Resource Legislation Amendment Act 2017 (2017 No 15) added s 108AA which requires conditions to be "directly connected" to an adverse effect of the activity on the environment or an applicable rule or national environmental standard or "relating to administrative matters" essential for the efficient implementation of the consent; see D Kirkpatrick and B Carruthers *Environmental and Resource Management Law* (online ed) at [4.65]. For discussion of the *Newbury* test (above) in connection to resource consent conditions for geothermal electricity production see *Rotokawa Joint Venture Ltd v Waikato Regional Council* EnvC Auckland A041/07 (18 May 2007) at [102] – [111] and [442].

[99] Note in the case of geothermal resource consents some consent holders have requested conditions that have no management value but which were subsequently granted by a regional council because of a historical precedent in geothermal consent conditions. This suggests a need for greater attention to be paid to geothermal resource consent conditions by a consent authority. From personal communication with Waikato Regional Council staff member (August 2017).

[100] *Wood v Selwyn District Council* (1994) 1B ELRNZ 94.

management plans in ensuring conditions are carried out.[101] For geothermal energy developments, consent conditions fall into three main categories: physical conditions limiting the physical details of what the consent allows for example water use, standard conditions relating to administrative matters such as site access and consent-holder charges and monitoring conditions requiring environmental monitoring and reporting.[102]

Section 108 lists a broad range of the kinds of conditions which may be prescribed and the ways in which certain conditions may be carried out by the consent holder. Of relevance to this study is the scope of conditions regarding the way information may be supplied to a regulatory authority:[103]

> (3) A consent authority may include as a condition of a resource consent a requirement that the holder of a resource consent supply to the consent authority information relating to the exercise of the resource consent.
>
> (4) Without limiting [the above], a condition made under that subsection may require the holder of the resource consent to do 1 or more of the following:
>
> (a) to make and record measurements:
>
> (b) to take and supply samples:
>
> (c) to carry out analyses, surveys, investigations, inspections, or other specified tests:
>
> (d) to carry out measurements, samples, analyses, surveys, investigations, inspections, or other specified tests in a specified manner:
>
> (e) to provide information to the consent authority at a specified time or times:
>
> (f) to provide information to the consent authority in a specified manner:
>
> (g) to comply with the condition at the holder of the resource consent's expense.

Resource consent conditions for geothermal energy developments apply all of these listed monitoring and information-supply conditions because the monitoring and management of geothermal energy developments is complex. Prescriptive information requirements such as these also show the extent of natural resource information (and data) provisions and environmental monitoring which must go on for sustainable management of resources under

[101] *Auckland Rowing Association v Auckland Regional Council* A002/98 EnvC (21 January 1998).

[102] Luketina (2000), above n 92, at [9.1].

[103] RMA 1991 s 108(3) and (4).

the Act. However, as will be seen, although consents for geothermal energy developments incorporate conditions (a) to (g) above as a matter of course, condition (f)—the provision of information to the consent authority in a specified manner—can raise legal challenges where a consent holder claims commercial sensitivity of consent-generated information and data and where policy or rules fail to be prescriptive in formalising data standards and compliance monitoring processes. Additionally, legal management issues arise regarding information and data management where there is uncertainty regarding the scope and role of independent peer review work. Such information challenges impact a regulatory authority's s 35 information-gathering and monitoring duties and the quality of resource management decision-making under the Act (discussed in the following chapter).

1 Review of Consent Conditions

Resource consent conditions may be reviewed by a consenting authority at any time or at times specified within a consent.[104] Conditions may be reviewed to address any adverse environmental effects, for any other purpose specified in the consent or if information supplied in the consent application contained inaccuracies which materially influenced certain decisions made by the consent authority pertaining to the consent.[105] Where inaccuracy of information results in the effects of the exercise of the consent being such that more appropriate conditions are required, review of consent conditions is useful for "fine-tuning" certain conditions as doing so can avoid difficulties in predicting exactly how an activity may affect the environment.[106] This process provides flexibility for both parties. The review of consent conditions must follow the review process set out in the Act; it may require public notification, a submissions opportunity and a hearing.[107] The resource consent holder may apply to a consent authority for a change or cancellation of a consent condition.[108] A consent holder may continue to operate where an existing consent is due to expire where the consent holder applies for a new consent for the same activity within prescribed timeframes.[109] Resource consent renewals

[104] RMA 1991 s 128(1)(a).

[105] RMA 1991 s 128(1)(a)(i) and (ii) and (c).

[106] Kenneth Palmer "Land Use, Subdivision, Designations, Resource Consent Procedures and Appeals" in Derek Nolan (ed) *Environmental and Resource Management Law in New Zealand* (5th ed, LexisNexis, 2015) at 332.

[107] RMA 1991 ss 129 and 130.

[108] RMA 1991 s 127. Note a regional authority itself cannot apply for a change of consent condition; see further Hilke Giles and Barry Barton "Adaptive Management under the RMA: the Tension between Finality and Flexibility" (2020) 24 NZJEL 1 at 27-28.

[109] RMA 1991 s 124.

provide an opportunity for consenting authorities and resource consent holders to review consent conditions—usually every 35 years.[110] There is no automatic right of resource consent renewal under the RMA; however, an existing consent holder will have priority over a new applicant for the ongoing use of a resource. A consent cancellation or change may also be made via an Environment Court enforcement order if a consent application contained information inaccuracies resulting in the consent being granted or following conviction of an offence under the Act.[111] Where the resource consent operated under previous policy and rules, compulsory policy evaluation[112] and review processes which change or update policy or rules will apply to a resource consent renewal.

C Management Plans

While a consent authority may not finalise every detail of a condition imposed, in order to be enforceable a resource consent condition requires specificity, clarity and accuracy of expression leading to a certain measure of certainty.[113] Decisions guided by these criteria ensure resource consent conditions facilitate workable, pragmatic environmental management solutions particularly in cases where uncertainty concerning long-term environmental effects necessitates staged use and development. In such cases, management plans have become increasingly used for complex consents under the RMA.[114] Management plans are legally required for large-scale geothermal resource consents and are known as "system management plans" (SMP).[115] The purpose of a management plan is to provide the regulatory authority and any other interested party with information about the way the consent holder intends to comply with the more specific controls or parameters laid down by resource consent conditions.[116]

A general difficulty with management plans lies in striking the balance between providing enough of the proposed content of the management plan so the decision-maker can assess a

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[110] This timeframe is based on the maximum duration given for water permits, RMA 1991 s 123.

[111] RMA 1991 s 314(1)(e) information inaccuracy, s 338 offences under the Act.

[112] RMA 1991 s 32, for example.

[113] *Ferguson v Far North District Council* [1998] NZRMA 238 at 244 (specificity and certainty); and *Pioneer Developments v Waitemata City Council* SC Auckland M 627/78 (*Pioneer Developments*) (16 February 1979) (settling of details pertaining to conditions).

[114] The RMA does not prescribe the use of management plans to achieve the purpose of the Act, however management plans have evolved as a non-statutory resource management tool under the Act.

[115] "System" refers to the particular geothermal system.

[116] *Wood v West Coast Regional Council* (*Wood*) [2000] NZRMA 193 (NZPT) at 6 and 7.

proposal and the need to retain a degree of flexibility where additional information on effects or mitigation options may emerge at a later date.[117] In *Wood v West Coast Regional Council* (where a fully formulated management plan was not required at the consenting phase), the Environment Court explained that in cases where developments in technology might change methods of compliance across time "the consent holder should have the ability to change the management plan without having to go through the formal process of seeking a change to the conditions of consent".[118] In *Crest Energy v Northland Regional Council* (a marine turbine electricity development in the Kaipara Harbour), an interim decision required a "fully fleshed" management plan because the proposal raised too many unanswered questions: "the Court must be satisfied that the environmental management plan can operate in a way that will serve the purpose of the Act".[119]

Another legal challenge with management plans concerns determining the threshold at which management plan adjustments *should* constitute condition changes. Management plans can also raise legal issues regarding delegated decision-making as under the RMA regulators may not delegate decision-making to a third party.[120] The delegation of *monitoring* functions however is allowed where the regulator seeks independent technical expertise. Third party expertise is required under regional geothermal policy for large-scale geothermal developments where the review of resource consents is delegated to a technical "peer review panel" (PRP).[121]

An Environmental Protection Authority Board of Inquiry addressed a concern that extensive use of management plans requiring approval or certification from council officers could result in a delegation of decision-making obligations.[122] The Board noted "the conditions of consent imposed [must contain] clear objectives to provide focus to management plan provisions and performance criteria which operate as bottom lines which the management plans must

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[117] Jennifer Caldwell and others *Conditions of Consent* (paper presented in Resource Management Law Association Roadshow, July 2014) at 13.

[118] *Wood*, above n 116, at 6 and 7; RMA 1991 s 127.

[119] *Crest Energy Kaipara Ltd v Northland Regional Council* EnvC Auckland A132/09 (22 December 2009) at [229].

[120] *Pioneer Developments*, above n 113. In respect of legal responsibility, a delegation does not exempt or excuse a local authority from the performance of a duty, RMA s 34(10). See further Giles and Barton (2020), above n 108, at 12-15.

[121] Delegation and the peer review panel's role in geothermal resource management is discussed further in chapter four.

[122] Environmental Protection Authority, Board of Inquiry *Final Report and Decision of the Board of Inquiry into the Transmission Gully Proposal* (June 2012) at [190].

achieve."[123] In *Westcoast Environmental Network v West Coast Regional Council,* the Environment Court also discussed unlawful delegation of decision-making: "we have decided that the extent of the drafting undertaken at this stage is adequate because the requirements for these management plans must be read in conjunction with the hold points and controls embedded in other conditions".[124] An independent expert may give advice on settling a detail of an imposed condition but should not act as arbitrator to determine compliance of conditions.[125] Both delegation of research as reasonably requiring third party involvement and the use of peer review are permitted in this way, *Environmental Defence Society Inc v NZ King Salmon Co Ltd*.[126]

D Adaptive Management

Where there is uncertainty regarding future environmental effects of resource use, the precautionary principle is commonly used as a basis for resource management decision-making.[127] While the RMA does not refer to the precautionary principle, it can be implied in the definition of environmental effect and the AEE.[128] Adaptive management is an approach which at least in part is borne out of the precautionary principle.[129] National policy statements and regional geothermal policies require and encourage adaptive management.[130] Like the use

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[123] At [190].

[124] *Westcoast Environmental Network v West Coast Regional Council* [2013] NZEnvC 178 at [43] and [45].

[125] *Turner v Alison* [1971] NZLR 833 (CA).

[126] *Environmental Defence Society Inc v New Zealand King Salmon Co Ltd* [2013] NZHC 1992, [2013] NZRMA 371.

[127] Internationally the precautionary principle is described in Principle 15 of the Rio Declaration on the Environment and Development (Rio Declaration) (1992) 31 ILM 874: "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". New Zealand has incorporated the precautionary principle to varying degrees in legislation; see for example, Hazardous Substances and New Organisms Act 1996 s 7; Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 s 64. See also the Fisheries Act 1996 sch 1A part II subpt 5(c) incorporation of United Nations Convention on the Law of the Sea (UNCLOS, 1982) and application of the precautionary approach. See further Alexander Gillespie "Precautionary New Zealand" (2011) 24 NZULR 364.

[128] RMA 1991 s 3(c) definition of effect includes "any past, present or future effect" and (d) "any cumulative effect which arises over time or in combination with other effects". For a review of the precautionary principle and the use of adaptive management in New Zealand case law, see Vernon Rive "Environmental Litigation and Dispute Resolution" in Derek Nolan (ed) *Environmental and Resource Management Law in New Zealand* (5th ed, LexisNexis, 2015) at [19.35]—[19.39]. See also Greg Severinsen "Bearing the Weight of the World: Precaution and the Burden of Proof under the Resource Management Act" (2014) 26 NZULR 375.

[129] David Kirkpatrick and Bronwyn Curruthers "The Coastal Environment" in Derek Nolan (ed) *Environmental and Resource Management Law in New Zealand* (5th ed, LexisNexis, 2015) at [5.65].

[130] For example, National Policy Statement for Renewable Electricity Generation (2011) at policy C1(e); and Waikato Regional Council *Waikato Regional Policy Statement* (2016) at Part A [3.3].

of management plans, adaptive management is not prescribed under the RMA. However, the technique of adaptive management is permitted in consent conditions and has been encouraged by the courts.[131] Adaptive management is a precautionary technique providing a pragmatic way forward that enables development while securing the ongoing protection of the environment.[132] The Environment Court has defined adaptive management as: [133]

> An experimental approach to resource management, or 'structured learning by doing', based on developing dynamic models that attempt to make predictions or hypotheses about alternative management policies. Management learning then proceeds by systematic testing of those models, rather than by random trial and error. Adaptive management is most useful when large complex ecological systems are being managed and management decisions cannot wait for final research results.

Crucially, the need for transparent disclosure of information from a resource user to the regulator is an important benchmark of adaptive management. Baseline surveys, flexibility of staging development and monitoring over time—with each stage being dependent on reviewed information—are some of the elements in an adaptive management framework.[134] In *Sustain Our Sounds Inc v New Zealand King Salmon Co,* the Supreme Court confirmed requirements to assess the ability of adaptive management to deal with risk and uncertainty.[135] These requirements were that: there will be good baseline information about the receiving environment, resource consent conditions provide for effective monitoring of adverse effects using appropriate indicators, thresholds are set to trigger remedial action before the effects become overly damaging and effects that might arise can be remedied before they become irreversible.[136] Whether risk and information uncertainty will be sufficiently diminished for adaptive management to be consistent with the precautionary approach depends on the extent of risk and uncertainty remaining and the gravity of the consequences if that risk is realised.[137]

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[131] *Crest Energy Kaipara Ltd v Northland Regional Council* [2011] NZEnvC 26 at [21] per Judge Newhook.

[132] Environmetnal Protection Authority, Board of Inquiry's decision in *New Zealand King Salmon Requests for Plan Changes and Application for Resource Consent* (*King Salmon Requests*) (22 February 2013) at [179]; see also *Clifford Bay Marine Farms Ltd v Marlborough District Council* EnvC Christchurch C131/2003 (22 September 2003).

[133] *Golden Bay Marine Farmers v Tasman District Council* EnvC Wellington W19/2003 (27 March 2003) at [405]. This aspect of the Environment Court's decision was upheld on appeal in *Minister of Conservation v Tasman District Council* HC Nelson CIV 2003-485-1072 (9 December 2003) per Young J.

[134] Caldwell and others (2014), above n 117.

[135] *Sustain Our Sounds Inc v New Zealand King Salmon Co Ltd* (*Sustain Our Sounds)* [2014] NZSC 40, [2014] 1 NZLR 673 at [124] – [129].

[136] Board of Inquiry *King Salmon Requests*, above n 132, at [181] – [182].

[137] *Sustain Our Sounds*, above n 135, at [129].

Internationally, definitions of the precautionary principle are more usually used for advocating precautionary measures to protect the environment rather than being concerned with taking precautionary measures to allow development.[138] It is also important to note regarding adaptive management for large-scale geothermal resource use that as a geothermal system is closer to being fully allocated for use and development there may be increasingly less flexibility with adaptive management measures; thus, adaptive management may be limited in its usefulness as a technique to achieve sustainable management.[139] As a geothermal system is developed, greater knowledge of the system and the likelihood of further resource being available for use should be gained. While this increased knowledge can help with adaptive management flexibility and new resource development options can become available, other options can be shut down.[140]

V RMA 1991 s 35 – Duty to Gather Information, Monitor and Keep Records

Section 35 sets out the functions, powers and duties of local authorities (including regional councils). Section 35 is key to the RMA's policy and rule development cycle and is central to sustainable management of resources under the Act. It establishes the requirement for local authorities to monitor the state of the environment, the effectiveness of policy statements and plans, the exercise of delegated functions or powers, the exercise of resource consents and to provide public access to environmental and decision-making information and records. Section 35 is the core "information provision" of the RMA and a core provision demonstrating the public function of property in natural resources.

The clearly stated legislative provisions of s 35 call for proactive and active resource management by regulators across the policy-development (including resource planning and

[138] International Union for the Conservation of Nature (IUCN) *Guidelines for Applying the Precautionary Principle to Biodiversity Conservation and Natural Resource Management* (as approved by the 67th meeting of the IUCN Council 14–16 May 2007); Rio Declaration Principle 15, above n 127; *Sustain Our Sounds*, above n 135, [109] – [112]; Claire Kirman and Justice Christian Whata "Environmental Litigation and Dispute Resolution" in Derek Nolan (ed) *Environmental and Resource Management Law* (5th ed, LexisNexis, 2015) at [19.34].

[139] *Waikato Regional Policy Statement* (2016) at [9.3.1] at [a.1]. See also Bay of Plenty Regional Council *Kawerau Geothermal System Management Plan* (2018) at [7.1].

[140] For example, industrial-scale resource extraction on the Kawerau geothermal system in the Bay of Plenty Region is carried out by multiple resource consent holders exploiting the same system; the resource is open to competitive extraction within the system because legally geothermal fluid may be drawn from an adjacent property. Current exploitation methods at the Kawerau system indicate resource extraction rates are at the maximum end of the sustainable-use spectrum. Therefore, the adaptive management tool may be of decreasing usefulness where maximum use-rates are applied. See further *Kawerau System Management Plan* (2018), above, at [7.1].

allocation) and the resource-consenting spectrum (including monitoring and enforcement of consent conditions). Consisting of six subsections, the first two subs of s 35 read:

> (1) Every local authority shall gather such information, and undertake or commission such research, as is necessary to carry out effectively its functions under this Act or regulations under this Act.
>
> (2) Every local authority shall monitor—
>
> (a) the state of the whole or any part of the environment of its region or district—
>
> (i) to the extent that is appropriate to enable the local authority to effectively carry out its functions under this Act; and
>
> (ii) in addition, by reference to any indicators or other matters prescribed by regulations made under this Act, and in accordance with the regulations; and
>
> (b) the efficiency and effectiveness of policies, rules, or other methods in its policy statement or its plan; and
>
> (c) the exercise of any functions, powers, or duties delegated or transferred by it; and
>
> (d) the exercise of the resource consents that have effect in its region or district, as the case may be; and
>
> […]
>
> take appropriate action (having regard to the methods available to it under this Act) where this is shown to be necessary. […].

Section 35(2)(d) relates directly to regional council (regulatory) monitoring and enforcement of resource consents and therein the state's management of the natural resource bargain delegated to regional authorities. To enable this management, a regional council must have full access to information and data generated by the consent holder under resource consent conditions; the natural resource bargain is upheld by a consent holder fulfilling its information duties under the consent. The power to prescribe resource consent conditions (including requiring a consent holder to supply particular kinds of information on how a resource consent is being exercised under s 108) also falls within the monitoring duty of s 35(1) and s 35(2)(d). Monitoring of delegated or transferred functions at s 35(2)(c) applies to large-scale geothermal resource management because standard resource consent conditions require regular review of a system management plan—a task delegated to an independent, technical peer review panel.

Section 35(2)'s requirement for "appropriate action" to be taken as a result of monitoring is the organisational response of the monitoring sequence described above. This applies equally to individual resource consents where an appropriate action may be for management plans to be "fine-tuned". The policy development cycle is an ongoing process and is no less so for geothermal policy where new information about the resource and resource management comes to light through operational experience, developments in technology and changes in geothermal systems through exploitation. New and changing energy demands are also relevant to policy and rule development.

The Ministry for the Environment has defined monitoring under s 35 as: "the deliberate act of observation and surveillance with a defined purpose" and as "an essential part of the planning process – the crucial link that 'closes the loop' in the plan-do-monitor-review process".[141] Monitoring is a purposeful, systematic process and one which recognises legal, technical, institutional and resource influences.[142] A simple sequence of monitoring includes: a monitoring purpose, data collection, information generation and organisational response.[143] Monitoring is expected to provide useful information upon which decisions can be made. Data collection and the physical gathering of information from the environment over time is a crucial phase because synthesis and analysis of data collected informs and assists quality natural resource and environmental decision-making. Simply, good data is able to translate into good information, leading to an informed response by a decision-maker. The monitoring requirements of individual resource consent conditions (and their accompanying management plans) for geothermal resource exploitation exemplify this point, as does the development and review of geothermal resource management tools such as the peer review panel's function discussed further below.[144]

Section 35(2A) – (5) also includes the duty of the regulator to make certain information publicly available.[145] Local authority records must be reasonably available to the public upon request without cost or unreasonable delay to both inform the public of their duties and the

[141] Ministry for the Environment *The Monitoring Guide: A practitioner's guide to section 35 of the Resource Management Act 1991* (1996) at [2.1].

[142] At [2.2].

[143] At [2.5].

[144] RMA 1991 s 35(2)(b).

[145] See further Trevor Daya-Winterbottom "The Role of Administrative Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (2nd ed, Thomson Reuters, 2018) at [6.3.2].

functions, powers and duties of the local authority and to enable the public to participate effectively under the Act.[146] The founding principle of the RMA at the time of enactment was that greater involvement by the public in resource management processes would result in more informed decision-making and ultimately better environmental outcomes.[147] The Act opened up to public participation the procedures for creation of policy statements, coastal plans, regional and district plans, and in respect of notified resource consent applications.[148] Information that is "relevant to the monitoring of resource consents" must also be made publicly available.[149] Section 35(5)(a) – (k) comprehensively lists a broad range of information which "shall be included" by the authority as information "reasonably available" to the public (including any information generated under s 35(1) and (2)). These cover copies of operative and proposed policy statements and decisions related to any proposed policy statements, records of all applications for resource consents (including information on decisions about consent notification decisions) and records of all resource consents granted, a summary of all written complaints received by it within the current five-year period and information on how it dealt with each complaint. The maintenance and availability of information and records for public inspection is based on democratic principles of participation and accountability in decision-making.[150] These RMA provisions provide for public access to natural resource and environmental information held by regional authorities and serve an important democratic function in natural resources law particularly in New Zealand where the state manages many valuable natural resources on behalf of the public.

A Section 35 History and Rationale

Before the enactment of the RMA, similar monitoring requirements to those in s 35 were found in the Town and Country Planning Act 1977, the Soil Conservation and Rivers Control Act 1941 and the Water and Soil Conservation Act 1967. Section 35 of the RMA is based on the principles and provisions of these Acts.[151]

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[146] RMA 1991 s 35(3).

[147] Kirman and Whata (2015), above n 138, at [19.3].

[148] Kenneth Palmer "Origins and Guiding Ideas of Environmental Law" in Bosselmann, Grinlinton, and Taylor (eds) (2013), above n 44, at 16.

[149] RMA 1991 s 35(3).

[150] The Official Information Act 1982 and Local Government Official Information and Meetings Act 1987 also support these principles, discussed further herein at chapter four.

[151] Town and Country Planning Act 1977 s 86; Soil Conservation and Rivers Control Act 1941 ss 127, 129 and 129A; and Water and Soil Conservation Act 1967 s 26(2).

The question of whether regional and local authorities were capable of fulfilling s 35 duties both in expertise and resource capability was acknowledged before and after the passing of the RMA.[152] To help address capability concerns, national guidelines for environmental monitoring were established by the Ministry for the Environment and research was undertaken to establish environmental indicators to be monitored at the regional level.[153] The change in the environmental management regime through the enactment of the RMA meant regional and local authorities took on new and changed responsibilities.[154]

Numerous legislative amendments to s 35 have occurred. In 2003 and 2013,[155] significant amendments which extend monitoring and reporting duties were made. Criteria for regulation-making pertaining to the section 35 duty have also been extended.[156] The 2003 amendment added a requirement for regional authorities to monitor for efficiency as well as for effectiveness and extended monitoring to cover "policies, rules, or other methods" in their policy statement or plan; prior to the amendment, only monitoring of the policy statement or plan was prescribed.[157] Timeframes for authorities to make available to the public the results of monitoring were specified, requiring not less than five-yearly reviews.[158] An extended description of information to be kept reasonably available to the public was also added to include records of all resource consent applications, all resource consents within the region, all decisions regarding them (subject to a number of related provisions) and records of the transfer of resource consents.[159]

The 2013 amendment extended the monitoring function again with reference to "any indicators or other matters prescribed by regulations" made under the Act.[160] Scope for regulation-making pertaining directly to the s 35 monitoring duty was also added by amendment elsewhere in the

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[152] Committee on the Resource Management Bill 1987–1990, first session, 42nd Parliament (Hon. Philip Woollaston, Chairman) at [6.15].

[153] Jonet Ward and Ruth Beanland *Contribution to a National Set of Environmental Indicators to be Monitored at a Regional Level* (information paper no. 36, Centre for Resource Management, Lincoln University, August 1992) at 1 and 7.

[154] Geoffrey Palmer *Reform: A Memoir* (Victoria University Press, 2013) at 431.

[155] Resource Management Amendment Act 2003 (2003 No 23); and Resource Management Amendment Act 2013 (2013 No 63).

[156] RMA 1991 s 360(1)(hk)(i) and (ii) and (hl).

[157] Resource Management Amendment Act (No.23) 2003 s 15; RMA 1991 s 35(2)(b).

[158] Resource Management Amendment Act (No.23) 2003 s 15; RMA 1991 s 35(2A).

[159] Resource Management Amendment Act (No.23) 2003 s 15; RMA 1991 s 35(5)(g) to (gc).

[160] Resource Management Amendment Act (No.63) 2013 s 7; RMA 1991 s 35(2)(a)(ii).

Act as extended power to make regulations prescribing for "indicators or other matters" in reference to an authority's duty to monitor the state of the environment. Section 35's scope was extended to make regulations prescribing "standards, methods, or requirements" applying to monitoring "which may differ depending on what is being monitored".[161] A 2017 amendment added section 35(2)(ca) to include monitoring for:[162]

> […] the efficiency and effectiveness of *processes* used by the local authority in exercising its powers or performing its functions or duties (including those delegated or transferred by it) […]

Continuing amendments to s 35 highlight its pivotal role under the RMA and how information provisions, information processes and their monitoring are central to sustainable management. Recent insight by the Parliamentary Commissioner for the Environment (PCE) showed that despite the "fair bit of tinkering with the wording" of RMA s 35, no regulations have yet been made under the amended provisions.[163]

The link between RMA information provisions and national-level environmental reporting is considered later in the thesis.

B NZ Rail and Geotherm

Surprisingly few resource management cases discuss the functional or substantive significance of s 35. Broadly, s 35 case law covers a range of legal issues; these reflect the various duties contained in the provision. For example, they include issues regarding the duty to provide information to the public,[164] distribution of s 35 duties between regional councils and territorial authorities,[165] an authority's duty of care in information gathering and record keeping[166] and an authority's duty to monitor resource consents.[167] Most references to s 35 arise either within

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[161] Resource Management Amendment Act (No.63) 2013 s 62(1); RMA 1991 s 360 (1)(hk) and (hl).

[162] Resource Legislation Amendment Act 2017 (2017 No 15) s 18(1). Emphasis added.

[163] Parliamentary Commissioner for the Environment *Focusing Aotearoa New Zealand's Environmental Reporting System* (November 2019) at 22.

[164] *Hay v Waitaki District Council* EnvC Dunedin 160 (24 May 2011), (claim unsuccessful, council under no general duty to provide information).

[165] *Re North Shore City Council* PTA Auckland, A87/94 (23 November 1994).

[166] *Mullen v Rodney District Council* HC Auckland CIV-2000-404-1512 (29 August 2003) (unsuccessful negligence claim); *Coromandel Heritage Protection Society v Thames-Coromandel District Council* HC Hamilton CIV-2007-419-1649 (11 February 2008) (unsuccessful negligence claim); *Bronlund v Thames-Coromandel District Council* HC Hamilton CP48-94 (2 April 1998) (successful negligence claim).

[167] *Junken v Gisborne District Council* (*Junken*) [2019] NZDC 24075; while *Junken* was ultimately a failure of the consent holder (a forestry company) to comply with resource consent conditions the Court strongly admonished the Gisborne District Council for its failure in s 35 resource consent monitoring.

a claim regarding a wider resource management issue or when s 35 is raised by a judge rather than by counsel. The latter occurred in an interim decision and report by the Planning Tribunal (now the Environment Court) in *New Zealand Rail and Others v Marlborough District Council* (*NZ Rail*).[168] Judge Skelton raised s 35 in the context of the (then) "new and reforming legislation" of the RMA, the monitoring and enforcement of resource consent conditions, the legality of management plans and how s 35 duties were directly linked to the public's role in natural resource management under the Act. While the *NZ Rail* approach to the purpose of management plans (particularly) has now evolved in New Zealand[169], *NZ Rail* contains insightful commentary about the substantive functions of s 35 particularly s 35(2)(d)—consent authority monitoring and enforcement of resource consents. The role of the public was highlighted regarding s 35(3) and public access to information (including about resource consents). As noted, resource consent conditions constitute essential terms of the natural resource bargain because monitoring the compliance of consent conditions continues as a mandatory function of regional authorities for the duration of a consent.

NZ Rail concerned the establishment of new port facilities—a complex matter and a major development by New Zealand standards.[170] Skelton J prefaced his discussion of s 35 with the general comment that the Planning Tribunal hoped it would help the parties and in particular the consent authorities (including the Minister of Conservation) to "understand why we are devoting what may appear to some to be a disproportionate amount of time and attention to this matter."[171] The Tribunal considered it had a "duty to ensure as far as we can, that [resource consent] terms and conditions are legally capable of being enforced".[172] Then proceeding to discuss the parties' amended resource consent conditions as "matters of critical significance",

[168] *New Zealand Rail Ltd v Marlborough District Council* (*NZ Rail*) (1993) 2 NZRMA 449 (PT). The Tribunal's interim decision and its report to the Minister of Conservation became the subject of an appeal to the High Court on questions of law however the appeal was disallowed *New Zealand Rail Ltd v Marlborough District Council* [1994] NZRMA 70 (HC), and the Tribunal's interim decision and its report were confirmed.

[169] The *NZ Rail* approach is now regarded as too narrowly focused; see Caldwell and others (2014) above n 117, at 14. Nonetheless, the broader focus of management plans can lead to a foot-in-the-door approach to resource development and less public oversight of resource consent monitoring. For example, while the EPA provides helpful criteria to "certify" management plans, and while *Turner v Alison* [1971] NZLR 833 (CA) is broadly upheld (that it is not appropriate to provide for a management plan on the basis that it is to be approved by a consent authority or some delegated official at a later time), the susceptibility of management plans to informal amendments, places them beyond public scrutiny in two regards. Firstly, because they may be changed informally (indeed that is seen as one of their advantages); and secondly, because the data and information generated under them can be claimed as proprietary (and commercially sensitive) by the consent holder.

[170] *NZ Rail*, above n 168, at 10 and 16.

[171] At 184.

[172] At 185.

his Honour discussed resource consent monitoring conditions which the Tribunal (had considered at the hearing and still) considered to be ultra vires because the applicant considered it was for the *consent holder* to monitor the resource consent conditions. In his explanation of s 35(2)(d)—"the duty to monitor the exercise of resource consents […] and [to] take appropriate action (having regard to the methods available to it under the Act)" and 35(3) which requires a local authority "to keep available […] information that is relevant to the monitoring of resource consents to enable the public to be better informed about their duties and the functions, powers and duties of the local authority, and to participate effectively under the Act"—Skelton J noted that "this would include exercising the right that any person has under the Act to bring enforcement proceedings."[173] His Honour declared, "a local authority has a duty to monitor resource consents":[174]

> Having placed on local authorities a duty to monitor, and having given them the power to fix administrative charges for doing that, and to make it a condition of a resource consent that those charges be paid, it seems clear that Parliament did not intend that local authorities in the capacity as consent authorities, should be able to require consent holders to monitor the exercise of their own consents. Indeed, we find nothing in the Act which places such an obligation on a consent holder.

Judge Skelton continued, the general duty to avoid, remedy or mitigate adverse effects under the Act "is only enforceable except by way of an enforcement order or abatement notice";[175] and, that no person shall be liable under the Act "except in accordance with the provisions of the Act".[176] Important to the present research, this judgment emphasised the distinct roles of the respective parties in the natural resource bargain, including the public's role (the role of wider, multilateral interests) in natural resource management under the RMA.[177]

These functional distinctions are examined further in the following case regarding development of geothermal resource management policy, *Geotherm Group Ltd and Others v Waikato Regional Council* (*Geotherm*).[178] This case is important: first, because lessons in geothermal resource management can apply to natural resource management broadly; secondly, because

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[173] RMA 1991 s 316.

[174] *NZ Rail*, above n 168, at 189 and 190.

[175] RMA 1991 s 17 and subs (2).

[176] RMA 1991 s 23, *NZ Rail*, above n 168, at 190.

[177] See also Skleton J in *BG Bird and Others v Timaru District Council* PT Christchurch C27/94 (11 March 1994) at 32.

[178] *Geotherm*, above n 17.

the case illustrates the RMA's functional complexity and the respective roles of the Environment Court, regional authorities, resource consent holder and other party's involvement in regional policy and rule development affecting information requirements for resource development. Finally, *Geotherm* is important because it concerns detailed information requirements and information processes particular to the practical and legal workability of the natural resource bargain's terms under resource consents. While *Geotherm* does not refer to s 35, a local authority's s 35 duties are illuminated in the Court's particular exhortation to the Regional Council to take an "active role" in its oversight and management of geothermal resources, including the operation of resource consents and management plans for electricity generation using geothermal resources.[179] The active role required of the regulator falls squarely within the ambit of responsibilities listed under s 35—especially the monitoring of policy and resource consents.[180]

Geotherm was a decision concerning appeals on proposed policy changes to the Waikato Regional Policy Statement (Policy) and Waikato Regional Plan (Plan) for geothermal resources.[181] The case contributed to a comprehensive review of geothermal policy in a formal policy variation of the Policy and a formal change to the Waikato Plan.[182] Since these planning instruments were finalised[183] installed capacity for geothermal electricity generation in the Waikato region has doubled.[184]

In appeals to the Environment Court where decisions regarding the content of regional statements and plans are appealed no formal legal onus rests on the appellant to prove that the

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[179] At [313] – [315].

[180] *Geotherm*, above n 17, at [315]. Note the Judge stopped short of describing the Council's active role. Kenneth Palmer *Environmental and Resource Management Law* (online ed) part 3 at [2.21] discusses the limited role of the Environment Court; sometimes the Court will formulate eg detailed rules but typically the Court requires the relevant administrative agency to finalise details.

[181] At [58].

[182] *Waikato Regional Policy Statement* Change No.1 and Proposed Waikato Regional Plan Variation No.2 – Geothermal Module. Variation No.2 – Geothermal Module was notified August 2003. Decisions on submissions were notified June 2004. The Waikato Regional Council received a number of appeals to decisions. The Proposed Waikato Regional Plan, Variation No.2 – Geothermal Module became operative November 2008; see <www.waikatoregion.govt.nz>. Note once a regional policy statement or regional plan is operative any new process to change its contents is called a "change" and if the document is not yet operative, such a process is called a "variation"; see RMA 1991 s 43AA.

[183] For a chronological overview of the issues in geothermal policy development in the Waikato region since the enactment of the RMA 1991, see KM Luketina and BN Dickie "Waikato Regional Council Geothermal Policy: On the Home Straight" (from proceedings New Zealand Geothermal Workshop, November 2006); and KM Luketina "Sustainability and the Democratic Process" (from proceedings World Geothermal Congress, Indonesia, April 2010).

[184] Luketina and Parson (2019), above n 4, at 208.

decision of the body at first instance is incorrect. The appeal is more in the nature of an enquiry into the merits of a decision in accordance with the statutory objectives and provisions of policy statements and plans.[185] The statutory objectives and the legal workability of the policy as a whole are assessed in reference to broader policy requirements under the Act.

Judge Whiting presided over the hearing and gave the Environment Court's final judgment. The hearing was over forty sitting days and evidence was heard from forty-six witnesses, many with international recognition in their respective fields.[186] Most expert witnesses were cross-examined extensively. The case appealed policy decisions of the Waikato Regional Council on two important policy issues: whether or not policy should require reinjection of extracted geothermal fluid back into the same geothermal system; and whether the regional policy should provide for multiple consent holders to exploit the same geothermal system.[187] Geothermal Group Ltd, Taupo District Council, Mighty River Power Ltd (now Mercury NZ Ltd), Contact Energy Ltd and Watercare Services Ltd appealed the Waikato Regional Council's decision.[188]

Expert witnesses for the appellants jointly supported the need for a structure or mechanism which ensured a "single coordinated management regime" if policy was to permit multiple energy developers on the same geothermal system.[189] Geothermal and planning expert witnesses agreed that the outcome of the policy should be "integrated [geothermal] system management".[190] It was acknowledged that despite this agreement the remaining difficulty was "how best to achieve integrated management of each geothermal system in practice".[191] After considering expert evidence and counsel's submissions, the Court considered that integrated system management "requires a package of objectives, policies, and methods […] plus some

[185] Kenneth Palmer *Local Authorities Law in New Zealand* (Brookers, New Zealand, 2012) at 854; see also Daya-Winterbottom (2018), above n 145, at [6.5.4].

[186] At [4] and [5].

[187] At [1].

[188] The Taupo District Council, in whose district the proposed policy would take effect, had concerns primarily regarding the adverse environmental effects relating to land subsidence; Watercare Services Ltd had concerns regarding fresh water quality and contamination as a result of geothermal resource development; and the remaining appellants (Geotherm Ltd, Mighty River Power Ltd, and Contact Energy Ltd) were resource consent holder companies exploiting geothermal resources for electricity generation.

[189] *Geotherm*, above n 17, at [302].

[190] At [306].

[191] At [307].

additional matters".[192] The information requirements and management processes it considered necessary for each "development geothermal system" were listed:[193]

A System Management Plan – including processes for preparation, amendment and review, and providing for operational flexibility and adaptive management;

B Reservoir modelling and subsidence modelling;

C Reinjection/Injection and Discharge Strategy – including any cascade (secondary) users;

D Multiple Operator Agreement(s) – regulatory requirement that multiple operator/consent holders coordinate and cooperate through agreements such as steamfield management agreements and field operations protocols. These agreements need to address such matters as: efficient and beneficial use of the resource; mechanisms for conflict resolution; and accountability for adverse effects;

E Research, Monitoring and Reporting;

F Peer Review Panel

G Review conditions and procedures

H System Liaison Group/Forum

As shown in the next chapter, resulting policy in the Waikato region for geothermal resources now incorporates these listed criteria. Indeed, various aspects listed such as management plans for the geothermal systems as part of resource consents and expert peer review panels (PRP) already formed part of the regulatory management. However, for the sake of clarity the Court saw it necessary to acknowledge the need for and the listing of all necessary integrated system management criteria. His Honour noted, "such a comprehensive suite would better satisfy the requirements of [RMA] section 32".[194]

The relationship between RMA s 32 and s 35 is relevant. Like s 35, s 32 falls within RMA Part IV. Section 32 concerns a regional authority's policy evaluation duty as part of the policy development cycle. [195] The mandatory policy evaluation criteria of s 32 acts as a final (internal) check on policy that is developed and on the policy that is actively monitored by regional authorities as required under s 35(2)(b). Judge Whiting's emphasising of s 32 shows how policy

[192] At [313].

[193] At [314].

[194] At [313].

[195] See Hewison (2018), above n 70, at [11.7.2].

must comply with policy evaluation requirements under the Act. The application of s 35 is implied by the Court's emphasis on the regulator's management of the resource regarding the effectiveness of the applicable policy (in that case, a combination of existing and proposed policy). In raising s 32 policy evaluations, the Court emphasises and keeps central the ongoing, purpose-driven role and responsibilities of the Regional Council regarding geothermal (and other natural) resource management. The Court in *Geotherm* echoes *NZ Rail* in stressing the need for regulators to maintain a dual focus on policy development and the legal workability of rules (including enforcement) under the RMA. The relationship between ss 35 and 32 is noted again in chapter eight.

The suite of information requirements also includes a liaison forum (H) for each development geothermal system; the forum was intended to give interested and affected parties "a voice"[196] and to enable formalised and regular communication with third parties and other stakeholders particularly territorial authorities. Peer review panels were intended to operate separately from the liaison forum; however, panel reports would be made available to the forum.[197]

In addition to the duty to monitor and evaluate environmental policy under sections 32 and 35, under the Act regional authorities must review regional policy in regional statements and plans within certain timeframes. [198] These documents must state significant regional issues, objectives, policies, methods used to implement policy, reasons for adopting objectives and policies and methods of implementation, results anticipated, processes between agencies and procedures used to monitor for effective and efficient implementation.[199] This considerable task is left to regional authorities. In the 1998, the Parliamentary Ccommissioner for the Environment's report noted that the RMA had dramatically changed the focus. Where pre-RMA less was required to be known about ecological functions and environmental impacts of resource use, the changes in information needs under the RMA were "not widely appreciated nor […] widely understood". [200]

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[196] Luketina and Dickie (2006), above n 183, at [7].

[197] Luketina (2010), above n 183, at [5]. Note the System Liaison Group/Forum specifically seems never to have been used however there may be potential to broaden the role of the peer review panel to include oversight of cultural and social objectives; see Penny Doorman and others "A Review of Geothermal Resource Management under the RMA 1991: With a View to the Future" (from proceedings New Zealand Geothermal Workshop, November 2021) at [3.6].

[198] RMA 1991 s 79(9).

[199] RMA 1991 s 62.

[200] Parliamentary Commissioner for the Environment *Information Needs of the RMA* (June 1998) at [iii].

Before the next chapter precedes to evaluate the effectiveness of legal information requirements of regionally developed geothermal policy and rules, RMA s 35A—the duty to keep records about iwi and hapu—is considered. This is an important information provision for Māori in the resource management system because it helps the Crown uphold its responsibilities to Māori as Te Tiriti partners. Furthermore, s 35A may also be viewed conceptually as an example of an information provision designed to uphold a multilateral interest in the typically bilateral natural resource bargain.

VI RMA 1991 s 35A – Duty to Keep Records about Iwi and Hapu

Apart from RMA Part II and specific provisions within the Act flowing from Part II concerning for example consultation with, participation of, and power-sharing of local authorities with Māori in resource management, there were few specific information requirements within the Act pertaining to Māori prior to the inclusion of s 35A by amendment in 2005.[201]

Section 35A(1) reads:

> For the purposes of this Act or regulations under this Act, a local authority must keep and maintain, for each iwi and hapu within its region or district, a record of (a) the contact details of each iwi authority within the region or district and any groups within the region or district that represent hapu for the purposes of this Act or regulations under this Act; and (b) the planning documents that are recognised by each iwi authority and lodged with the local authority; and (c) any area of the region or district over which one or more iwi or hapu exercise kaitiakitanga; and (d) any Mana Whakahono a Rohe [iwi participation arrangement] entered into […].

Subsection (2) requires the Crown (via its agency, Te Puni Korkiri)[202] to provide local authorities with information for the purposes of subs (1)(a) and (c); furthermore, the local authority "must include in its records all the information provided by the Crown", that is:[203]

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[201] Resource Management Amendment Act 2005 s 16 (2005, No 87). Note, although not explored in this thesis, RMA provisions about proposals for national direction in resource management (ss 45(2)(h) and 46A), and provisions requiring consultation with Māori (ss 149K, 154 and sch 4), Māori involvement in natural resource planning, and relationship development and power sharing (ss 33, 36B and 58L-58U) all have "information requirement" features; particularly planning requirements such as at ss 62(1)(b), 61(sA), 65(3)(e), 65(5), 66(2A), 74(2A) and sch 1 cls 3(1)(d). See further Ministry for the Environment *New Directions for Resource Management in New Zealand: Report of the Resource Management Review Panel* (June 2020) at 85-116.

[202] Te Puni Kokiri has developed *Te Kahui Mangai* an information directory of Iwi and Māori organisations to assist the Crown in meeting its s 35A obligations. See <www.tkm.govt.nz/>. Te Puni Kokiri records information on Iwi identified in the Māori Fisheries Act 2004, Iwi and hapu that have been recognised by the Government for Treaty settlement purposes, and Iwi authorities and groups that represent hapu for the purposes of the RMA; see *Director-General of Conservation and others v Taranaki District Council and others* [2018] EnvC 203 (Interim Decision) at [346].

[203] RMA 1991 s 35A subs (2)(a)(i)-(ii).

information on (i) the iwi authorities within the region or district of that local authority and the areas over which one or more iwi exercise kaitiakitanga within that region or district; and (ii) any groups that represent hapu for the purposes of this Act or regulations under this Act within the region or district of that local authority and the areas over which one or more hapu exercise kaitiakitanga within that region or district. In addition to information listed above, a local authority may also keep a record of additional information.[204] The requirement above "does not apply in relation to hapu unless hapu […] requests the Crown or the relevant local authority (or both) to include the required information for that hapu in the record"; that is, it is voluntarily provided by hapu.[205] The following three subs (5-7) relate to: other enactments prevailing over the RMA were information or advice of another enactment conflicts with information under s 35A; information under s 35A must be used by the local authority only for RMA purposes; and information under s 35A to be provided in accordance with any prescribed requirements. Section 35A(7) anticipates regulations for this purpose; however, none for this purpose has been promulgated to date.

Section 35A was added to the RMA as part of 2005 amendments aimed at strengthening relationships between Māori and local authorities.[206] Prior to 2005, there was no obligation on the Crown or local authorities to maintain records of iwi and hapu for RMA purposes. Section 35A was considered to provide greater certainty for resource planning and consultation purposes. Generally, the 2005 amendments front-loaded local authority consultation with Māori at the policy and plan development stage and clarified existing law that consultation about resource consent applications was not mandatory (s 36A).[207]

A Tuwharetoa

While case law has clarified applications of s 35A generally,[208] a judgment of the Environment Court, *Tuwharetoa Māori Trust Board v Waikato Regional Council and Others* (*Tuwharetoa*),

[204] RMA 1991 s 35A(3) additional information may be information (a) on iwi, obtained directly from the relevant iwi authority; and (b) information on hapu, obtained directly from the relevant group representing the hapu for the purposes of the RMA or regulations under the Act. (Abridged).

[205] RMA 1991 s 35A subs (4)(1).

[206] Jenny Vince "Māori Consultation Under the Resource Management Act and the 2005 Amendments" (2006) NZJEL 10, 295 at 296. Additional provisions included s 36A "no duty to consult about resource consent applications" (considered as clarifying local authority duties regarding Māori); ss 36B–E which provides for joint management agreements between local authorities and Iwi authorities; and sch 1 cl 3A which sets out the procedure local authorities must follow for consultation with Iwi in relation to the preparation of policy and plans.

[207] At 295.

[208] See for example *Director General of Conservation and others v New Zealand Transport Agency*, (2019) above n 202.

concerning Māori involvement in geothermal resource management where s 35A had effect was deemed by Judge Kirkpatrick to raise "a matter of national importance" in relation to RMA ss 6(e) and (7)(a).[209] The case demonstrates how a statutory information provision such as s 35A can have direct implications for the involvement of multilateral interests within the natural resource bargain—in this case, the interests of Ngati Tuwharetoa particularly.

The Tuwharetoa Māori Trust Board (the appellant) sought a kaitiaki role for itself in respect of the Rotokawa geothermal resource,[210] particularly in relation to the resource consents granted by Waikato Regional Council (the respondent, the Council) to Rotokawa Joint Venture Limited (RJVL, the applicant). In its submission on RJVL's consent application, Tuwharetoa sought amendments to the general conditions on the resource consents to include its representatives on the resource consent review committee (the peer review panel) set up to consider the monitoring data from the exercise of the consents.[211] The Council refused to provide for the kaitiaki (guardianship) role in the consent conditions and both the Council and RJVL opposed the relief sought by Tuwharetoa. As joint-venture partners in RJVL, Ngati Tahu – Ngati Whaoa owned the land on which RJVL operated and held mana whenua (ownership or association in land) in respect of Lake Rotokawa and its associated resources, including the Rotokawa geothermal resource, and essentially denied that Tuwharetoa held any mana whenua at Rotokawa. The Court identified the issues as falling into two main areas: 1) the holding of mana whenua and the exercise of kaitiakitanga; and 2) the management of the geothermal resource under the RMA.[212] While the Court was satisfied that the potential for physical changes to the geothermal resource giving rise to significant cultural effects as a result of the consent applications was at a very low level[213] and despite acknowledging both Ngati Tuwharetoa and Ngati Tahu – Ngati Whaoa had mana whenua status, the Court established that resolution of the issues was best achieved by resource management methods "that do not

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[209] *Tuwharetoa Māori Trust Board v Waikato Regional Council* (*Tuwhareto*) [2018] EnvC 093 at [45], [71], [118] and [141]. Reference to s 35A is implied at [52(c)] however it notable that although the Court refers to *Te Kaui Mangai* directory the Court does not mention s 35A.

[210] The Rotokawa geothermal system is one of approx. 15 known high-temperature geothermal systems within the Taupo Volcanic Zone, and is located approx. 10 km to the north-east of Taupo city and straddles the Waikato River; see *Tuwharetoa* at [16].

[211] *Tuwharetoa*, above n 209, at [1] and [138]. Note the resource consent review committee also receives and considers the comments made by the PRP on data generated under the exercise of the consents.

[212] At [4].

[213] At [33]. The environmental effects were judged by the Court to have less to do with physical effects and more based on matters identified as being of special importance under Part II of the RMA 1991.

depend on property rights."[214] Nor did the Court consider the case to be about determining customary authority: "it is about the most appropriate conditions of resource consent relating to the use and development of the Rotokawa geothermal field."[215]

The Court then noted inclusion in the Waikato Regional Plan of various iwi (tribes, including both Tuwharetoa and Ngati Tahu – Ngati Whaoa) as having an interest in geothermal energy and geothermal taonga (treasure).[216] The Plan also stated its recognition and acknowledgement "that Ngati Tuwharetoa are tangata whenua of their rohe [tribal area] […]". Moreover, the Council acknowledged this was so "by reference to information provided by the Crown through its *Te Kahui Mangai* website",[217] thus showing the resource consent application site fell within an area where the rohe of Ngati Tuwharetoa and Ngati Tahu – Ngati Whaoa overlap.

The approach taken by the Waikato Regional Council whose counsel submitted that "the Council does not make decisions on who has mana whenua and kaitiakitanga status" presented the Court with difficulties. Judge Kirkpatrick listed the two difficulties as: 1) "the Council effectively *did* make such a decision by its […] rejection of Tuwharetoa's submission seeking a kaitiaki role on the Peer Review Panel", which was why the matter was before the Court; and 2) "Council cannot abdicate its role as a decision-maker in respect of a matter that is an *essential element* of resource management in the application before it".[218] The Judge continued, "A decision-maker is required to make decisions and so, for better or worse, it must address the issues before it, including those of status where they arise."[219] The Court found that the regional policy documents' many references to the status of Tuwharetoa meant that the Council's decision to exclude Tuwharetoa conflicted with its own planning documents;[220] additionally, Tuwharetoa was found to be an affected party not merely an interested party in consultation "which fell well short" of what the Court considered good practice.[221]

The Court found that both RJVL and the Council "appear to have placed considerable reliance on processes undertaken 20 years ago to guide the identification of potentially affected parties

[214] At [45] per Kirkpatrick J.

[215] At [52].

[216] *Waikato Regional Plan* (2007) at [2.2.5] and [2.2.5.2].

[217] *Tuwharetoa* at [52]. *Te Kaui Mangai* is the information directory of Te Puni Kokiri, see above n 202.

[218] Kirkpatrick J at [53] – [55]. Emphasis added.

[219] At [55].

[220] References to policy documents at [76] – [78], and conflicting advice, at [88].

[221] At [89].

in today's environment".[222] In the context of how consent conditions may best deal with effects on the environment (including metaphysical effects), the Court decided that "arguments about rights may no longer have binary character"; rather, "the central issue between the parties is whether, and if so to what extent, someone other than the consent holder and the consent authority should be able to participate in the monitoring and review of the exercise of the consents."[223] Again, in a pedagogical role, the Environment Court explains the need for representation and involvement of multilateral (in this case, Ngati Tuwharetoa's) interests in the formulation and operation of the natural resource bargain:[224]

> We readily acknowledge that setting conditions which result in meetings where people are present who challenge each other's role may lead to tension and dispute. But if the alternative is exclusion which is also likely to result [in the same], then that may very well be a much worse outcome. There is also the need to recognise that pursuing the sustainable management of a resource may well involve tensions and disputes. These are not necessarily adverse results: the process of participation at least provides a forum for civil dialogue and may enable better exchanges of information and analysis which could enhance the sustainable management of the resource. Of course, it may also not have that result, but the Court will not shy away from setting appropriate conditions on the basis that some people may not like having to deal with some others.

This judgment points to the need for natural resources law to reflect the circumstances of the 21st century; that is by providing for wider interests than the bilateral interests typically reflected in the natural resource bargain. It also shows that regardless of whether legal information requirements exist (in statute or policy), their interpretation and application is another matter.

To summarise, the provisions and case law applications of ss 35 and 35A show that statutory information provisions that are not functionally linked to wider and enforceable statutory objectives are at risk of weak (or sometimes no) application. Recommendations by the current resource management reform Review Panel proposed that a National Māori Advisory Board could monitor Te Tiriti performance from a Māori perspective, including oversight of RMA s 35A.[225] Case law shows that a range of Māori, public and private interests can be recognised

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[222] At [88].

[223] At [137]. The Court also noted that because the case was not concerned with "the grant or refusal of consent or with the allocation of limited quantities of finite resources, there does not appear to be any basis for an 'all or nothing' approach to the management of the geothermal resource", at [137]; see also at [139].

[224] At [138].

[225] Ministry for the Environment *New Directions for Resource Management in New Zealand: Report of the Resource Management Review Panel* (June 2020) at 111. Note also the Review Panel's preference to replace "Iwi

in natural resource management. The cases referred to—*NZ Rail*, *Goetherm*, and *Tuwharetoa*—also all discuss the importance of the application and review of policy provisions and rules (the policy development cycle) in natural resources law. To that end the Review Panel noted the weak links between RMA ss 32 and 35 in practice.[226]

VII Key Points

In discussing the statutory and theoretical basis for legal requirements for information under the RMA, this chapter laid a foundation for analysing the further information provisions for geothermal resource development found in regional policy and plans. Broadly, the chapter has explored the *function* of information requirements, why legal information requirements are a central component of natural resources law and why they are also essential terms in a natural resource bargain. The respective roles of Māori interests, the regulator (resource consent authority), resource user and the public show that information provisions can and should also provide for multiple interests in the management of natural resources.

Non-statutory resource management tools supporting the purpose of the RMA such as adaptive management and third-party peer review rely on accurately reported resource consent holder information (and data) and on legally credible information management processes. Like policy and plan rules, the operation of these resource management tools also requires evaluation and monitoring. Examination of RMA ss 35 and 35A showed how the provisions are key in both requiring and driving information provisions under the Act but that in practice there are weak links in these provisions.

The next chapter looks further into the specific *content* of information requirements, the *operation* of management tools and their accompanying information processes for large-scale geothermal resource use in regional policy and rules. The application of these information requirements is analysed against RMA s 5. In that process, further attention is given to the internationally (and nationally) accepted description of geothermal resource renewability and how this is reflected (or not) in regional policy. The policy development process and parties' involved in policy and rule formation for geothermal resource exploitation are also examined to identify how policy and rules and their information provisions are *formulated.*

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authority" and "tangata whenua" with the term "mana whenua" under the proposed Natural and Built Environments Act, at 112-113.

[226] At 228 and 374-376, the Review Panel found that in practice there is a weak link between RMA 1991 ss 32 and 35 and that s 35 provisions are "not always followed by most local authorities".

CHAPTER FOUR

REGIONAL POLICY FOR GEOTHERMAL RESOURCES

I Introduction

This chapter gives particular attention to information provisions designed to enable the parties in the natural resource bargain to meet their respective needs under the RMA. Regional policy and plans for high-temperature geothermal resources are found in the Northland, Bay of Plenty and Waikato regions. The policy and plans examined show how the resource consent process and consent management by a regional council and independent peer review panel (PRP) rely on the provision of resource information and data from a consent holder. Information requirements for a resource consent application help a regional council assess the proposed resource use and help to form resource consent conditions. Information requirements for a consent holder explain how (and how much) a resource is intended to be used, anticipated environmental effects and intended mitigation and/or remediation measures where effects cannot be avoided. The ongoing provision of information and data to a regional council (and PRP) under a resource consent enables a regional council to gauge consent-holder compliance with resource consent conditions.

Overall, the purpose of the chapter is to identify, explain and critically examine how legal information provisions and information management processes ranging from regional policy and regional plan rules to resource consent conditions and consent monitoring and enforcement *function*. The effectiveness of these processes is directly linked to wider regional authority duties to monitor the state of the environment regionally, given these results should in turn impact future geothermal resource planning and future geothermal resource allocation considerations. Along with broad policy goals and information requirements for resource consent applications, resource consent management tools—especially adaptive management and the use of PRPs—are examined. The use of technical modelling in geothermal resource management is also explained, including its potential limitations in relation to regulatory compliance processes.

Considerably detailed geothermal policy and rules have been developed in recent years, with extensive consent-holder input, especially in the Waikato region. The chapter shows that policy and rule-making for geothermal resource management is demonstrably a negotiation process. The current Waikato Regional Policy Statement and Waikato Regional Plan have greatly reduced previous descriptive content under the first-generation Policy and Plan about geothermal resource characteristics, including an explanation of geothermal resource renewability and what sustainable management entails practically. This chapter examines the repercussions of these policy changes at rule level and in the application of RMA s 5. The public and private functions of property in natural resources are considered in light of these changes.

Chapter five (the last of the geothermal resource chapters) then analyses the regulatory relationship between a resource consent holder and a regional council and PRP.

II Regional Management of Geothermal Resources

Although geothermal resources are found throughout New Zealand, 90 per cent of geothermal electricity generation occurs in the Waikato region's high-temperature geothermal systems.[1] The Bay of Plenty region has the second-largest geothermal electricity generation and extensive direct applications of geothermal fluid/steam for industrial processes, while the Northland region contains New Zealand's only other high-temperature geothermal system where one electricity developer exploits geothermal resources. Because most electricity development occurs in the Waikato region, this chapter focuses primarily on the Waikato's Policy and Plan; however, a broad overview of Northland and Bay of Plenty regional geothermal policy is given as it relates to legal provisions for information and information processes to ensure sustainable management of geothermal resources.[2] The Bay of Plenty Kawerau System Management Plan information management processes are examined in detail. Comparisons are made between Waikato and Bay of Plenty policy and rules and how the

[1] Waikato Regional Council *Waikato Regional Policy Statement* (2000) at [3.7.1]. Note the 2000 version is the first-generation Waikato regional policy statement.

[2] Note *Geotherm Group Ltd and Others v Waikato Regional Council* (*Geotherm*) EnvC Auckland A047/2006 (13 April 2006) does not set a precedent for geothermal policy which other regions must follow. As a matter of strict legal principle, a decision of the Environment Court can only bind the parties and the local authority in respect of a particular case but in practice certain decisions of the Environment Court may well form clear guidelines and standards which are followed by local authorities and other Judges unless distinguished or not applicable in the factual circumstances; see Kenneth Palmer *Environmental and Resource Management in New Zealand* (online ed) Part 3 at [2.22].

respective regional councils collaborate in geothermal resource management for large-scale use. Table 4.1 shows differences between regions' policy and plan rules.

Over the last decade particularly, the Waikato and Bay of Plenty Regional Councils have attempted to align their respective geothermal policy and plans while also providing for their region-specific resource management needs.[3] The most significant differences in their respective regional planning for geothermal resources concern policy and plan references to geothermal resource renewability, sustainable use definitions and their different approach to making information generated under resource consents publicly available. To date, Northland regional policy has generally not followed this interregional policy development; however, Northland Regional Council's management of its large-scale geothermal resource is very similar in practice.

Current resource management reform has implications for geothermal resource development policy consistency nationally.[4]

A Northland Region

Northland's Regional Policy Statement (Policy) and Regional Plan (Plan) do not identify specific tangata whenua with interests in geothermal resources, although the documents make many references to Māori interests in natural resource management and to working with tangata whenua.[5] Northland's Policy and Plan do not specify particular information requirements for large-scale geothermal resource use. The Northland Policy acknowledges the regional authority's duty under RMA s 35 in its general review and monitoring policy.[6] "Audited self-management" is encouraged in particular instances which means "a management programme (individual, industry, or resource user collective) which allows for the credible and transparent demonstration (audit) that agreed actions have been implemented".[7]

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[3] See Penny Doorman and others "A Review of Geothermal Resource Management under the RMA 1991: With a View to the Future" (from proceedings New Zealand Geothermal Workshop, November 2021).

[4] See Doorman and others (2021) above.

[5] For example, a guiding principle of Northland Regional Council's *Regional Policy Statement* (2016) at [1.3] is recognition of the "partnership principles in the Treaty of Waitangi / Te Tiriti o Waitangi" and the key role tangata whenua have in resource management. Statutory acknowledgements at [1.7] are noted but not listed and issues of significance to tangata whenua are found at [2.5] and [2.6].

[6] Northland Regional Council *Northland Regional Policy Statement* (2016) part 10, review and monitoring procedures.

[7] *Northland Regional Policy Statement* (2016) glossary definitions.

Adaptive management is a guiding principle of the Policy and where adverse effects from regionally significant infrastructure occur decision-makers will "give weight to […] whether a monitoring programme […] could be included as a condition of consent and an adaptive management regime (including modification to the consented activity) is used to respond to such effects".[8] The Policy grants that Northland has not effectively and sustainably managed its natural resources to fully realise its economic potential and social well-being, with a limiting factor being "poor security of energy supply" with geothermal resources listed as a potential renewable energy source with important existing renewable electricity generation at the Ngawha geothermal power station.[9] The Plan lists geothermal resource use under "taking and use of water" with large geothermal "takes" classified as a discretionary activity.[10] When considering generation of renewable energy, particular regard is given to the high-temperature geothermal resource at Ngawha, where sustainable use and development means avoiding lowering the temperature of geothermal waters or the loss or limitation of its use.[11] No Policy or Plan definition or description is provided for "sustainable use" of geothermal resources or geothermal resource renewability.

The sole geothermal electricity developer (Ngawha Generation Ltd) secured land access by private agreement with Māori landowners at Ngawha.[12] The power station was commissioned in 1998 and production expanded in stages with output expected to reach 57 MW.[13] A lack of competition for large-scale use of the geothermal resource at Ngawha may contribute to the paucity of information and monitoring requirements in Northland's Policy and Plan. The Regional Council states that monitoring and information-related requirements are "not an issue"

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[8] *Northland Regional Policy Statement* (2016) at [1.3], [5.3.3], and [5.3.3 (3)(f)]. See also at [5.4.3 (10(e)] methods for statutory plans and strategies to "have particular regard to the use of adaptive management techniques".

[9] *Northland Regional Policy Statement* (2016) issues [2.3], [3.9] and policy [5.4.1].

[10] Northland Regional Council *Northland Regional Plan* (2014) at [25.3]. See also at [9.2], [10.2] and sch C.

[11] *Northland Regional Plan* (2014) at [10.5(c)]. Note Northland Regional Council *Northland Regional Plan* (proposed version, 2020) at [D.2.12(3)(c)], "effective generation of energy from geothermal resources will include the need to consumptively use geothermal heat and pressure".

[12] Ngawha Generation Ltd is a subsidiary of Top Energy and operates as a joint venture partner with local Māori via a Māori trust (Tai Tokerau), see Eru Rerekura and Te Manu Korihi "Iwi and Council back Geothermal Deal" *Radio NZ News* (25 August 2015). For a historical and legal account of Māori ownership of the Ngawha geothermal resource, see Waitangi Tribunal *The Ngawha Geothermal Resource Report* (Wai 304, 1993).

[13] Subject to a monitoring period to prove the sustainability of the geothermal resource Ngawha Generation Ltd's resource consents provide for a second power station to expand its output to 88MW by 2025, see <www.ngawhageneration.co.nz> and <www.topenergy.co.nz>.

in managing resource consents on the Ngawha geothermal system.[14] The Policy identifies "consistency in interpreting and implementing the law" as desirable yet problematic; "while businesses require certainty, they often also want flexibility".[15]

Northland's Policy and Plan rules for large-scale geothermal resource development could be more consistent with those of the Waikato and Bay of Plenty regions.[16]

B Bay of Plenty Region

While the Bay of Plenty Regional Policy Statement and Regional Plan [17] make many references to Māori and resource management,[18] including Māori values in geothermal resources and identification and protection of geothermal taonga, specific tangata whenua are not identified within these documents in relation to the Kawerau geothermal system.[19] However, as required by the regional Policy, the Bay of Plenty Regional Council produced the Kawerau System Management Plan, a resource management guidance document applying to all extractive users on the Kawerau geothermal system.[20] This guide names Kawerau tangata whenua with interests in geothermal resources. [21]

The Policy accepts that geothermal systems are the source of considerable energy which can be used for direct heat purposes or to generate electricity. [22] Reducing reliance on non-renewable energy sources by encouraging development of renewable energy is a policy, with geothermal resources expected to contribute significantly to meeting New Zealand's energy

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[14] Personal communication with resource consent manager Stuart Savill, Northland Regional Council (March 2017).

[15] *Northland Regional Policy Statement* (2016) at [2.3] economic potential and social well-being.

[16] Regional variations in the geothermal systems themselves may dictate policy differences to a certain extent. While the Northland Regional Council and consent holder use peer review and management plans for geothermal resource consents on the Ngawha geothermal system, Northland's policy and rules do not specifically refer to or require these management tools for geothermal resource management.

[17] Bay of Plenty Regional Council *Regional Natural Resources Plan* (2008) geothermal resources [GR] chapter 19.

[18] For example, the Bay of Plenty Regional Council *Regional Policy Statement* (2014) acknowledges the role of tangata whenua in managing natural resources as protected by the Treaty of Waitangi (Te Tiriti o Waitangi) at [1.1]; and [2.6] sets out the "Māori environmental resource management system".

[19] Bay of Plenty *Regional Policy Statement* (2016) at [2.4]; Bay of Plenty *Regional Natural Resources Plan* (2008) at [7.1.1].

[20] Bay of Plenty *Regional Policy Statement* at policy [GR 1A, GR 2A, GR 3A, and GR 7B]; Bay of Plenty Regional Council *Kawerau Geothermal System Management Plan* (2018).

[21] *Kawerau Geothermal System Management Plan* (2018) at [1.5.2], [1.6], and [2.9], [2.10], and [2.11].

[22] Bay of Plenty *Regional Policy Statement* (2014) at [2.4].

demand.[23] The many values associated with geothermal resources are acknowledged and a region-wide view is taken to provide for these values.[24] "Allocation of geothermal resources" is also a regionally significant issue because "[u]sing the regional geothermal resource for energy development and protecting its other values is a difficult balance."[25]

The Policy lists a "lack of information" as a regionally significant geothermal resource issue, stating "it is difficult and expensive to assess the quantity and nature of the resource".[26] The region's only large-scale development is on the Kawerau geothermal system where in addition to electricity production by multiple consent holders direct use of geothermal resources for industrial purposes (timber and pulp and paper processing) also occurs.[27]

The Policy requires "sustainable use of the renewable resource" through integrated management and use of the precautionary approach.[28] "Sustainable use" of geothermal resources is explicitly defined and acknowledges that a reduction in enthalpy (heat energy available for use) could occur due to extractive use and that extraction rates required for economic use mean that the resource could be used at a rate that could deplete it over a small number of future generations thus making it economically unavailable for a few generations until the heat supply recovers.[29] Over a specified 50-year period the level of use affects sustainability and renewability.[30] Sustainable use for geothermal resources "requires a case-by-case consideration of the resource for its extractable energy use values".[31] In particular, the following matters are considered when determining sustainable use for "extractive uses":[32]

- the level and certainty of scientific information on the particular [geothermal] system;
- the size of the geothermal energy resource;

[23] At [2.3.2] and [2.3.3(4)].

[24] At [2.4].

[25] At [2.4.1(2)].

[26] At [2.4.1(3)].

[27] *Kawerau Geothermal System Management Plan* (2018) at [1.5.2] and [3.6].

[28] Bay of Plenty *Regional Policy Statement* (2014): sustainability at [1.6], [2.4] and appendix A definition of "sustainable use" in relation to geothermal resources; precautionary approach at [1.7]; and integrated management at [1.9] and [2.5].

[29] Bay of Plenty *Regional Policy Statement* (2014) at [2.4] and [2.4.1(4)]; the full explanation of "sustainable use" for geothermal resources exploitation is found at appendix 1. The *Kawerau System Management Plan* (2018) at [2.3] and appendix 3 also defines "sustainable use" in relation to geothermal resources.

[30] Bay of Plenty *Regional Policy Statement* (2014) at [2.4].

[31] At appendix A definitions "'sustainable use' for geothermal use purposes".

[32] At appendix A. Emphasis added.

- the rate at which the energy within the geothermal system is proposed to be extracted, *and the timeframe over which any proposed rate of take of geothermal energy is predicted to be able to be sustained, informed by modelling for a period of at least 50 years* (the depletion rate is a matter for decision makers to determine when an application is being considered);
- the predicted quantity of energy available for extractive use *at the end of 50 years*;
- *the predicted length of time that the geothermal system will take to recover once extractive use ceases;*
- the overall management of the geothermal resource, including the depth and locations of the proposed take and return of geothermal fluid, and *the impacts of such management on the longevity of the resource*; and
- once extractive use has commenced, how closely observed changes to the geothermal resource affecting its productive capacity and longevity match the modelled or predicted effects, by review of the data and other information collected. This information could include: pressure, temperature, chemistry, surface water flow or level and vegetation monitoring indicating the state of the geothermal resource, including identified changes to geothermal features.

These Policy considerations to determine sustainable use—especially within a predicted timeframe and the quantity of energy available at the end of 50 years—are unique to Bay of Plenty regional policy for geothermal resources and are echoed in the region's Kawerau System Management Plan noted below.[33] Neither the Waikato's nor Northland's regional geothermal policy goes to these lengths either in describing what sustainable use in the geothermal development context means nor what its implications are. These omission are notable in relation to geothermal resource renewability.

Under general procedures for monitoring resources, the Policy lists information from resource consents as necessary to assess whether policy objectives are being met.[34] Monitoring indicators and anticipated environmental results are set for "holistic and sustainable management of the regional geothermal resource […] enabling use and development of geothermal systems in accordance with each system's management purpose".[35] Monitoring indicators for large-scale use require "integrated system management provisions in all geothermal consents for large takes; discharge strategies in all geothermal consents for large discharges; and, consent compliance reporting".[36] Anticipated environmental results are for "*sustainable use* of geothermal systems [with] pressure and temperature within an acceptable

[33] *Kawerau System Management Plan* (2018) at [2.3] and appendix 3.

[34] Bay of Plenty *Regional Policy Statement* (2014) at [4.1] and [4.1.4].

[35] At [4], policy objective [8].

[36] At [4], policy objective [8].

range for known system behavior" and resource-use efficiency.[37] Adaptive management, staged development, discharge strategies and consent compliance reporting are listed under geothermal resource management objectives.[38] Resource information provided to the regulator by consent holders is "commensurate with the scale of the activity"; key aspects of large-scale applications are independently peer reviewed.[39] Resource users are "to identify which information lodged with the consent authority is commercially or culturally sensitive, such that its publication or communication should be prohibited or restricted".[40]

The Bay of Plenty Plan lists methods of implementation and rules for geothermal resources.[41] Geothermal resources are classified in five management groups. As "high temperature geothermal systems available for sustainable use and development",[42] large-scale development falls within management group four. Under its explanation and principal reasons for geothermal policy, the Plan states: "under section 35 [of the RMA], the Regional Council has a duty to gather adequate information to understand the appropriate management of geothermal resources and to determine the effectiveness of provisions in this regional plan, and monitor the state of the environment".[43] The Plan recognises the need to "gather and maintain sufficient quality information to enable the effective management of geothermal resources, including contemporary modelling data where appropriate".[44]

As noted in chapter three, RMA sch 4 notes that a requirement to include information in an assessment of environmental effects (AEE) is subject to the provisions of any policy statement or plan.[45] Regional Plan information requirements relevant to geothermal resource consent applications and an applicant's provision of an AEE therefore read as follows:[46]

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[37] At [4], policy objective [8]. Empahsis added. Note sustainable use of geothermal systems (single systems) is in contrast to the Waikato region's policy, see further below.

[38] Bay of Plenty *Regional Policy Statement* (2014) at [4], policy objective [8].

[39] At policy [GR 5B (a) – (c)].

[40] At policy [GR 5B (c)].

[41] Bay of Plenty *Regional Natural Resources Plan* (2008) chapter 19 geothermal resources; issues, objectives and policies are listed in addition to implementation methods and rules.

[42] At [GR P3] policy 121.

[43] At appendix 1 [GR].

[44] At [GR P8] policy 126.

[45] RMA 1991 sch 4 cl 6(2).

[46] Bay of Plenty *Regional Natural Resources Plan* (2008) chapter 19 at [GR M7 and M8] regulatory methods 246 and 247.

> Require resource consent applicants to provide the following information, where the information is appropriate to the scale and significance of effects that the proposed activity may have on the environment:
>
> (a) Modelling and research data relating to the potential of the field and its characteristics and values.
> (b) The amount of geothermal resource available for allocation from the field.
> (c) The extent of geothermal surface features and associated ecosystems.
>
> The information is to be provided in such detail as corresponds to the scale and effects of the activity. This may require staged exploration and testing prior to any development […].

Generally, information and data provided in a resource consent application and its accompanying AEE not only provide a basis for the granting of a resource consent but also provide the regional council with information to build up a region-wide picture of the geothermal resource because – for example – (a) to (c) above are not actions undertaken by regional councils themselves under their standard duties to research and gather information about the environment (RMA s 35).

The Bay of Plenty Plan lists "information to be submitted with resource consent applications" for geothermal resources by way of cross-reference numbers to objectives, policies and methods within the Plan.[47] The Plan states: "due to the variety of resource consents that may be applied for, and the variation in scale of likely activities, it is not possible to give a single comprehensive checklist of information required for any application".[48] However, the Policy lists criteria for the mandatory Kawerau System Management Plan.[49] Under "matters relevant to resource consent applications and processing", one of the regional Plan's regulatory methods is to "protect commercially sensitive information relating to the use and development of geothermal resources in accordance with section 42 of the [RMA]" (discussed below).[50]

1 Kawerau System Management Plan

Geothermal resource exploitation on the high-temperature Kawerau geothermal system (the Kawerau system) is carried out by multiple consent holders where individual developers have

[47] At appendix 3.

[48] At appendix 3 information to be submitted with resource consent applications.

[49] Bay of Plenty *Regional Policy Statement* (2014) policy [GR 7B].

[50] Bay of Plenty *Regional Natural Resources Plan* (2008) at [CR M7, method 246].

secured land access by private agreements with landowners.[51] The Bay of Plenty Regional Council manages geothermal resources on the Kawerau system through its Policy and Plan rules, and with the guidance of the Kawerau System Management Plan (SMP). Its purpose is to provide "transparency around existing processes for the management of the [system]".[52] Because resource consents were granted before regional policy required a system management plan, it was agreed that the SMP would be largely an operational document akin to a multiple operator protocol.[53] The intent is that the document would also provide guidance to the regional council (including the peer review panel) on the ongoing administration of the resource consents and the Kawerau system overall. The Kawerau SMP differs from geothermal system management plans in the Waikato region because it pertains to one geothermal system which is developed by multiple consent holders and was developed collaboratively.

Forming part of the Taupo Volcanic Zone, the Kawerau system extends over approximately 35 square kilometres and is interconnected both vertically and laterally. Pressure changes in the system are transmitted rapidly through the reservoir.[54] Over nearly 70 years, exploitation of the Kawerau system involving multiple extractors, complex industrial processes and many stakeholders has occurred in stages. Generally, management of the system has been achieved through "operational flexibility and adaptive management, as well as cooperation and flexibility among consent holders".[55] Mechanisms to ensure cooperation between all consent holders are designed so as not to preclude utilisation of the resource by a trade competitor or other potential user (without sound resource management justification).[56]

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[51] The four geothermal consent holders on the Kawerau system are Mercury NZ Ltd (formerly Mighty River Power Ltd), Ngāti Tūwharetoa Geothermal Assets Ltd, Geothermal Developments Ltd, and Te Ahi o Māui Partnership; see Penny Doorman and Jim McLeod "The Changing Face of Geothermal System Management Plans in New Zealand" (from proceedings New Zealand Geothermal Workshop, November 2018) at [2.2]. More generally see Bay of Plenty Regional Council <www.boprc.govt.nz/environment/geothermal-resource/kawerau-geothermal-system>.

[52] *Kawerau Geothermal System Management Plan* (2018) at [1.8.(b)].

[53] Doorman and McLeod (2018), above n 51, at [2.2].

[54] *Kawerau Geothermal System Management Plan* (2018) at [1.1] and [3.7.4]. For a historical overview of industrial and commercial use of the geothermal resource system at Kawerau from 1951, see Brian R White and Isabelle Chambefort "Geothermal Development History of the Taupo Volcanic Zone" (2016) 59 Geothermics 148 at [2.5], [3.4], [3.5] and [4.8].

[55] *Kawerau Geothermal System Management Plan* (2018) at [5].

[56] Bay of Plenty *Regional Policy Statement* (2014) policy [GR 7B (e)]. For example, see *Kawerau Geothermal System Management Plan* (2018) at [4.3] and [7.1.2], and private agreement mechanisms between consent holders at [7.7].

Resource consent holders on the Kawerau system are required to provide the Regional Council and the assigned peer review panel with any information that it reasonably requires to manage resource consents. Such information includes "records, data, and outputs of modelling and monitoring programmes".[57]

In practice, the Regional Council generally classifies all information and data received by resource consent holders on the Kawerau system as commercially sensitive, including resource consent management plans (known on the Kawerau system as "operational management plans") and peer review panel reports about consent holder compliance.[58] According to the SMP, "much of the information associated with geothermal resource consents has the potential to be commercially or culturally sensitive"; therefore, such information is managed by the Council on the public's behalf.[59] In determining whether certain information should be released in the public interest, a raft of "relevant" matters are listed "by way of guidance"; however, their relevance and justification for inclusion is unclear.[60] The SMP states that any future allocation of the resource should represent "the reasonable amount required by the consent holder without depriving other potential consent holders"; moreover, "resource banking" is constrained through "conditions of consent relating to timeframes for consents to be exercised".[61]

However, it is difficult to understand how a trade competitor or potential resource consent applicant on the Kawerau system gains access to knowledge about the resource (even basic knowledge about the system's remaining, available resource capacity) when information, data and reports produced under resource consents are generally not publicly available. Both the RMA[62] and the Commerce Act 1986 (but particularly the later) take matters of trade

[57] *Kawerau System Management Plan* (2018) at [7.12] and [7.13.3].

[58] On the Kawerau system "operational management plans" are attached to some resource consents and are specific to steam field operations such as well-drilling, take and discharge points and management of plant infrastructure; see *Kawerau System Management Plan* (2018) at [7.1] and [1.8(f)].

[59] *Kawerau Geothermal System Management Plan* (2018) at [7.12]. Public interest determinations by the regional council regarding access to information generated under geothermal resource consents are made on a case-by-case basis either under RMA s 42, or the Local Government Official Information and Meetings Act 1987 s 7.

[60] At [7.12].

[61] *Kawerau System Management Plan* (2018) at [7.8].

[62] The RMA contains many provisions prohibiting trade competition; whether in the development of regional policy and plans (ss 61(3) and 66(3)); in resource consent application determinations (s 104(3)9a); determining whether adverse environmental effects are more than minor 9s 95D(a)(i) and (ii), and (d)); or in proceedings for submissions on certain matters (s 149E(5) and (8); see also sch 1.

competition seriously.[63] Consent-holder information management under the Kawerau SMP and under geothermal resource consents more broadly is discussed later in the context of consent-holder and consent authority "information management protocols".

C Waikato Region

1 Tangata Whenua and Geothermal Resources

The Waikato Regional Policy Statement affirms that geothermal characteristics are valued by tangata whenua and policy recognises and provides for the mana whenua relationship of tangata whenua and their role as kaitiai with the characteristics of particular geothermal systems, fields and geothermal features. Policy "ensure[s] that tangata whenua identify specific resource management matters of traditional and contemporary cultural significance".[64] Māori have a special relationship with geothermal resources and consider them as taonga which places an obligation on tangata whenua as kaitiaki to ensure that geothermal resources are maintained and handed to on to future generations in a healthy condition.[65] Tangata whenua with particular interest in geothermal resources are listed in the Policy.[66]

Hapu and Iwi geothermal management plans are to be supported and where appropriate their development is to be facilitated by local authorities.[67] An objective of the Waikato Plan is that "uncertainty for all parties regarding the relationship between tangata whenua and resources for which they are Kaitiaki [should be] minimised" and that tangata whenua are able to give effect to kaitiakitanga.[68] Assessment criteria for large-scale resource consent applications for geothermal resources in the Plan are required to assess "the extent to which the cultural values of tangata whenua are recognised including their kaitiaki role with the geothermal resource".[69]

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[63] Commerce Act 1986 ss 1A, 4, 5(1), 27, 28 and 47. Note the largest consent holder on the Kawerau geothermal system (Mercury NZ Ltd) is majority-owned by the state.

[64] Waikato Regional Council *Waikato Regional Policy Statement* (2016) geothermal policy [9.8].

[65] At [9.8].

[66] At [9.8.3].

[67] At [9.8.2].

[68] Waikato Regional Council *Waikato Regional Plan* (2007) at [2.3.2]; and further regarding geothermal resources at [7.7(3)]. For a Māori model of sustainability for geothermal resource management, see DCH Hikuroa, TKKB Morgan, M Henare, and M Gravley "Integrating indigenous values into geothermal development" (2010) 34 Transactions – Geothermal Resources Council 51-54.

[69] *Waikato Regional Plan* (2007) at [7.6.1.4] assessment criteria [iv].

As noted in *Tuwharetoa* geothermal system management plans in the Waikato region require tangata whenua representation on the peer review panel.[70]

2 *Geothermal Resource Classifications*

"Providing for energy demand"[71] is one of the six regionally significant resource management issues and issues of significance to iwi authorities listed in the Policy. Specific focus is directed at addressing the following: how increasing energy demand is to be met; security of energy supply; and the need to maintain the efficiency of, and production from, existing renewable energy generation activities.[72] The issue is summarised:[73]

> With increasing demand for energy coupled with Government objectives and targets regarding renewable energy generation, there is an increasing need for improvements in the way we use energy, and for new energy projects and associated infrastructure, and increasing need to manage potential adverse effects on natural and physical resources.

The policy objective to address this issue is "sustainable management of the *regional* geothermal resource".[74] This objective is promoted by ensuring integrated management of geothermal systems, by protecting some characteristics of the regional geothermal resource from significant adverse effects and by:[75]

> [a]llocating some of the geothermal resource for take, use and discharge in a way that enables current energy needs and the reasonably foreseeable energy needs of future generations to be met, while avoiding, remedying or mitigating significant adverse effects on the regional geothermal resource[.]

Classifying geothermal systems for management provides a policy to achieve the sustainable management of the regional geothermal resource "in a way that provides for multiple uses".[76] Sustainable management of the regional geothermal resource "will only be possible by considering the resource in its entirety [region-wide] and managing each [geothermal] system in a way that collectively achieves the objective of management of the [regional] resource as a

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[70] As discussed in chapter three *Tuwharetoa Māori Trust Board v Waikato Regional Council* [2018] EnvC 093. See *Waikato Regional Policy Statement* (2016) at [9.3.3].

[71] Part A issue [1.3].

[72] Part A issue [1.3] matters (a), (d), and (f).

[73] Part A issue [1.3].

[74] Part A issue [1.3] objective [3.17]. Emphasis added.

[75] At [3.17].

[76] Part B policy [9.1] and [9.1(a)].

whole".[77] To ensure the resource is allocated, protected and used appropriately, it is recognised that a range of uses including energy extraction, low impact use, research and protection of geothermal features should be provided for.[78] The Policy classes geothermal resource systems as follows:[79]

- *development* geothermal systems, where large-scale development of resources may occur;
- *limited development* geothermal systems, where large-scale development could adversely affect significant geothermal features;
- *protected* geothermal systems, containing significant natural geothermal characteristics, or those within the National or World Heritage Area;
- *research* geothermal systems, where insufficient information is available to identify the system as fitting within existing system classifications; and
- small geothermal systems not connected to large systems and which either do not produce water higher than 100°C or is not greater than 10 km3.

The Policy requires geothermal system classifications to be further identified in the Plan.[80] Pending reclassification as a development, limited development or protected geothermal system,[81] classification of research geothermal systems is intended to be temporary. Until enough is known to reclassify research systems, a precautionary approach is taken to protect the resource characteristics. A range of activities are allowed on research systems, including the continuation of legally established existing takes, limited new small to medium scale takes and takes and discharges for scientific investigation. These include: investigation to determine whether or not the system is connected to another; delineating the resistivity, hydrological and other boundaries of the system; determining other characteristics of the system such as heat and mass outflow, and gas and water chemistry; or identifying, mapping or describing geothermal features and their characteristics within the system.[82] If geothermal resources are found outside an existing (classified) system, its classification defaults to a research system which—with appropriate data and information—may become an extension of an existing

[77] Part B policy [9.1] (explanation excerpt).

[78] Part B policy [9.1].

[79] Part B policy [9.1] implementation method, and [9.1.1] classification of geothermal systems. Classifications abridged and emphasis added.

[80] Part B policy [9.1] at [9.1.1].

[81] Part B policy [9.1] at [9.6.1].

[82] Part B policy [9.1] at [9.6.1].

system.[83] Under the Plan, any party may request a change to the classification of a geothermal system (except a protected system) through a change to the Plan.[84]

Most known development geothermal systems in the Waikato region have already been allocated to resource consent holders for large-scale electricity production.[85] Additionally, although the Policy provides for multiple consent holders to exploit the same development geothermal system, no multiple developer scenarios currently exist. Furthermore, land access agreements between existing resource consent holders and landowners largely preclude access by new entrants to such geothermal systems.[86]

3 Information and Resource Monitoring

The Waikato Policy and Plan highlight the importance of information, high-quality data, research and monitoring for geothermal resource management.[87] The more knowledge and information that are available about each geothermal system and the effects of its use, the better the ability to manage and respond to potential and existing beneficial and adverse effects.[88] The Policy also requires the consent authority to "facilitate investigation, research and

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[83] Personal communication with Waikato Regional Council staff member (August 2017): "Research" is an unstable classification and sooner or later the classification will morph into something else. Research systems are not for the purpose of research but for the future classification of the system as development or protected systems. "If we discover a new system then it will automatically start off as a 'research' system. If we find resource outside existing 'systems' then by definition it defaults to a 'research' system, which with appropriate data and information may become an extension of an existing system."

[84] *Waikato Regional Plan* (2007) at [7.4] implementation method [2(1)]. Protected Geothermal Systems are identified in the *Regional Policy Statement* ((2016) at [9.5]) where a request for a change to a RPS may only be made by a Minister of the Crown or a territorial authority within the region; see Waikato Regional Council *Waikato Regional Plan* (2007) at [7.4] implementation method [2(2)].

[85] *Waikato Regional Plan* (2007) at [7.4] table [7-1]; the Waikato region's seven Development Geothermal Systems are at Horohoro, Mangakino, Mokai, Ngatamariki, Ohaaki, Rotokawa, and Wairakei-Tauhara. The two largest geothermal electricity developer companies in the Waikato region are Contact Energy Ltd and Mercury NZ Ltd.

[86] At [7.4] policy 5. Note geothermal fluid may be drawn from an adjacent property because the resource is open to competitive take within the geothermal system. For an overview of Waikato regional policy development history from single to multiple consent holder policy (per geothermal system), see Katherine Luketina "Sustainability and the Democratic Process" (from proceedings World Geothermal Congress, Indonesia, April, 2010) at [5.4]. Note the Wairakei-Tauhara geothermal development system in the Waikato region was the subject of extensive litigation between two parties exploiting the same system prior to the multiple consent holder policy; see *Special Tribunal of the Waikato Catchment Board v Electricity Corporation of New Zealand Ltd* HC Hamilton M7/89 (9 March 1989); and *Waikato Catchment Board (Special Tribunal) v Electricity Corporation of New Zealand* [1989] 2 NZLR 22 (CA). For an excellent summary of this litigation which spanned two decades, see Simon Anthony Schofield "The Law of Climate Change Mitigation in New Zealand" (Master of Laws dissertation, University of Canterbury, 2012) at 112-115.

[87] *Waikato Regional Policy Statement* (2016) part B policy [9.1] at [9.1.11] and [9.1.12]; and *Waikato Regional Plan* (2007) at [7.3] issue [6].

[88] *Waikato Regional Policy Statement* (2016) part B policy [9.1].

monitoring of the characteristics of geothermal systems" and to "encourage and provide for the collation and dissemination of data and information about […] the effects of development and use of geothermal systems".[89] Despite this requirement, it is striking that the Policy and Plan provide almost no description for a layperson seeking to understand the dynamics of a geothermal system and related environmental management issues. Nor for example are the Regional Council's "other documents" pertaining to geothermal resources mentioned in the Policy or Plan made available either through references or hyperlinks.[90] The Policy requirement for collation and dissemination of information and data (noted above) forms part of a regional council's public function in managing the publicly owned geothermal resource.

The Plan recognizes that where surface geothermal features exist, they provide only a small indication of the extent of the resource and its hydrodynamic characteristics. As such, geophysical and geochemical techniques and understanding of geology must be applied to understand the resource and "sustainable management of geothermal systems requires inputs from these disciplines, reservoir modelling and other disciplines to provide a useful model of system dynamics".[91]

The Plan identifies "a lack of information and knowledge about the regional geothermal resource and effects of its use can create uncertainty for management of the resource"[92] as a significant resource management issue for geothermal management. A Plan objective is increased knowledge about the regional geothermal resource, and the principal reason for adopting this objective is that it is important that information be made available to support regional decision-making and policy direction.[93]

4 How Geothermal Resource Monitoring Occurs

Monitoring of geothermal systems occurs in a number of ways. In addition to its own historical records compiled through ongoing management of geothermal resources, the Waikato Regional Council also sources information through means such as regional monitoring with

[89] Part B policy [9.1] at [9.1.11(a) and (c)].

[90] *Waikato Regional Plan* (2007) at [7.2.1].

[91] At [7.3] principal reasons for adopting objectives, objective [8]. Note this phrasing implies that *development* geothermal systems are used "sustainably".

[92] At [7.3] issue [6].

[93] At [7.3] objective [8] principal reasons for adopting the objectives.

aerial mapping of geothermal surface features and ground level surveys.[94] In conjunction with monitoring as a part of consent compliance, this information is maintained in a regional database.[95] While such information is used to monitor resource use under resource consents, it is also used more broadly to support regional decision-making and policy development.[96]

Monitoring of geothermal systems occurs mostly through the information and data consent holders supplied to the consent authority in compliance with resource consent application processes and resource consent conditions. Because geothermal systems are complex, most of the data on subsurface resources is typically poor and limited to locations where wells have been drilled.[97] Gathering information from complex physical systems is costly and time-consuming. For example, a typical large-scale geothermal development will collect information on the volume, geometry and boundary conditions of a reservoir; properties of the reservoir rocks such as permeability, porosity, heat capacity and heat conductivity; and temperature pressure and distribution. It may be years before a reservoir's real behaviour is known. Resource consent holders will monitor the resource in order to comply with resource consent conditions and to build up a picture of the resource for their own purposes.

The regional Policy information requirements for development geothermal systems state that the Plan shall:[98]

> a. require relevant information relating to the use and development of geothermal resources and of the effects of their use and development be lodged with Waikato Regional Council;
> b. require publicly available System Management Plans and regular monitoring and reporting of the effects of exercising consents for large-scale takes in Development Geothermal Systems;
> c. require information commensurate with the scale of the activity for all proposed activities affecting geothermal resources;
> d. require that System Management Plans associated with large scale applications are independently peer reviewed; […].

[94] At [7.8].

[95] At [7.8]. Note the *Waikato Regional Plan* does not indicate whether this is a regional-, inter-regional- or national-level database.

[96] At [7.3].

[97] See John Burnell and others "Sustainability of TVZ Geothermal Systems: the Regulatory Perspective" (2016) 59 Geothermics 10.

[98] *Waikato Regional Policy Statement* (2016) part B at [9.1.12] information requirements.

The Plan lists extensive assessment criteria for resource consent applications in development geothermal systems. These for example include: the extent to which there is appropriate provision of reservoir modelling and subsidence modelling, data to support the initial extraction rate and production levels and the adequacy of the monitoring programme.[99]

5 *System Management Plans*

After the enactment of the RMA, the Waikato Regional Council acknowledged the importance of geothermal management plans and the importance of the regional authority's and public's having unrestricted access to good quality data and information regarding large-scale geothermal developments.[100] The first-generation Waikato regional policy statement required management plans for development systems.[101] The first-generation regional plan however contained no reference to management plans for geothermal resource use, and inconsistencies between these documents resulted in a decision by the Council to comprehensively review the policy for geothermal resources.[102] Regional plans must now must give effect to a regional policy statement and contain detailed information requirement rules.[103]

A system management plan (SMP) is mandatory for resource consent for large-scale development of geothermal systems in the Waikato region.[104] The purpose of a geothermal

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[99] *Waikato Regional Plan* (2007) at [7.6.1.4] assessment criteria (vi) and (vii)]. In practice rules in the *Waikato Regional Plan* (2007) may not be prescriptive enough for the provision of information by consent holders and how they are reflected in resource consent conditions. Note from personal communication with Waikato Regional Council staff member (March 2016).

[100] Jim McLeod *Geothermal Management Strategy: Management Structure* (staff discussion paper, Waikato Regional Council, 30 November 1992) at [14]; and Waikato Regional Council *Geothermal Management Strategy: Issues and Options (*staff discussion paper, 7 May 1992) at [17]. See also Doorman and McLeod (2018), above n 51, at [2.1].

[101] *Waikato Regional Policy Statement* (2000) at [3.7.4] policy [1].

[102] Katherine Luketina and Blair Dickie "Waikato Regional Council Geothermal Policy: On the Home Straight" (from proceedings New Zealand Geothermal Workshop, November 2006) at [2]. The Waikato Regional Council invested a total of NZD 1.4 million over 3.5 years into the revised Policy and Plan package for the management of geothermal resources. This included the costs to the Regional Council of resource investigations and associated contracts; policy design and consultation with affected parties; funding the complete RMA sch 1 process, including project stages and milestones. Other costs (for example to the parties appealing policy decisions and appeal processes) can be added to this cost summary; see KM Luketina "Sustainability and the Democratic Process" (2010), above n 86, at [3].

[103] See RMA 1991 s 65 subs (6) and (7) inserted by amendment by Resource Management Amendment Act 2005 s 39(c) (2005 No 87).

[104] *Waikato Regional Policy Statement* (2016) part B at [9.3.1(a)]. Note an SMP forms an appendix to a resource consent and can be upwards of 150 pages in length.

SMP is to define the objectives for the management of a geothermal system. As appropriate, it provides for (among other things):[105]

- operational flexibility and adaptive management including provision for subsequent uses;
- research, monitoring and reporting;
- non-statutory review of the [SMP] if in the opinion of the consent holders and the [regulator], such amendments are minor;
- recognition that the geothermal water remaining after use should be reinjected/injected;
- management of controlled resource depletion, including through modelling assessments, to determine appropriately stepped production; and
- preparation of a discharge strategy, forming part of the [SMP].

These provisions and objectives facilitate the different priorities and needs of the consent authority and consent holder and recognise the need for ongoing monitoring and adjustment (where necessary) of the SMP.[106] The Policy states development geothermal systems must be managed in an integrated manner through:[107]

> [t]he development of a system management plan for each development geothermal system; establishing a peer review panel for the purpose of assisting the consent authority to manage the system; and the development and imposition of appropriate resource consent conditions.

Preparation and implementation of an SMP are crucial to the management of each development geothermal system in the Waikato region. An SMP is a whole-system management approach that recognises the need to consider the use and development of a geothermal system and all its parts in an integrated manner and to provide strategies for adaptive use and development.[108]

Although the Policy and Plan do not specify the process for formulating an SMP, a draft SMP is required as part of a resource consent application on development systems. The draft SMP helps a regional council consenting officer assess the applicant's ability to comply with policy and rules and shows how the consent holder intends to comply with consent conditions. The Policy provides a detailed requirements lists for the SMP; furthermore, an assigned peer review

[105] At part B [9.3.1], see further at [9.3.1] for a comprehensive list of SMP requirements.

[106] *Waikato Regional Plan* (2007) at [7.6.1.4] advisory notes.

[107] *Waikato Regional Policy Statement* (2016) part B at [9.3(c)(i), (ii) and (iii)].

[108] Doorman and McLeod (2018), above n 51, at [2.1].

panel must have regular oversight of the SMP.[109] The SMP must include monitoring and reporting processes by the resource consent holder, including an information management protocol for information and data management between the consent holder, peer review panel and the consent authority.[110]

An examination of protocol content from two separate geothermal developer companies (below) shows a variance as to (what appears to be) the commercial stance taken by different consent holders. Arguably a protocol reflects a consent holder's respective understanding of legal protection for information generated under resource consents, official information considerations under RMA s 42 and Local Government (Official Information and Meetings) Act 1987 s 7. As approved by the regulator as part of the SMP and overall resource consent application, a protocol may also reflect the regulator's (or more accurately a particular resource consenting officer's) understanding of the legal implications of the Plan's protocol rule. While this matter may appear as a distracting "aside", as later discussed the protocol is an example of an information management process affecting natural resource management. Before examining information processes under the SMP, the work of peer review panels and the use of adaptive management, it is first necessary to understand geothermal resource renewability and sustainable resource use in further detail. The Waikato Policy and Plan provide no definitions to this effect, so the wider literature is used.

6 *Sustainable Management and Efficient Use*

The Waikato Policy attempts to sustainably manage the region's geothermal resources *as a whole* (primarily through geothermal systems' classifications) and to manage the *efficient* use of individual development geothermal systems.[111] Neither the Policy nor the Plan requires sustainable use of *individual* development geothermal systems, nor are geothermal information requirements in the Policy and Plan formulated to ensure sustainable use of individual development systems.[112]

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[109] *Waikato Regional Policy Statement* (2016) part B at [9.3.1(a)] and [9.3.3].

[110] *Waikato Regional Plan* (2007) at [7.4], see implementation methods for policies 3 and 4 at [1.vii].

[111] *Waikato Regional Policy Statement* (2016) part B at [9.1] and [9.3(a)].

[112] This is in contrast to the Bay of Plenty *Regional Policy Statement* (2014) approach noted above. Note the Bay of Plenty *Regional Policy Statement* at [1.15] and at [2.4], states that the integrated approach to resource management, anticipates "sustainable and consistent use of natural and physical resources across jurisdictional boundaries" with consistency between *Waikato Regional Policy Statement* and Bay of Plenty *Regional Policy Statement* provisions regarding cross-boundary issues of resource management significant to both regions.

The Policy allows for "controlled depletion" of the resource in *development* geothermal systems.[113] Under the Plan, controlled depletion means "resource use at a rate that allows for the energy needs of current and future generations to be met, while promoting efficient use and management of the resource, and while considering the capacity of the resource as a whole".[114] While this definition says what controlled depletion is, it does not explain *how* controlled depletion works or *how* a particular use-rate provides for future generations' needs.

The Policy "intention" is "to enable large-scale efficient and sustainable" take, use and discharge of geothermal energy and water in *development systems*, while recognising that doing so will result in the depletion of energy in the system (ie the mining of heat) with "the appropriate degree of efficiency and the rate of depletion determined *through resource consent processes*".[115] The Policy's stated intention regarding "sustainable take, use and discharge" in development geothermal systems is the only Policy (or Plan) reference to *sustainable use* regarding exploitation of development geothermal systems.

Unlike the comprehensive definition of sustainable use for geothermal resources found in the Bay of Plenty Policy, both the Waikato Policy and Plan fail to define or explain what sustainable use of a development geothermal system; rather, "it is implied"[116] and is decided at resource consent level. Nor do "environmental results anticipated" under the Plan include for example sustainable use of development geothermal systems. The Policy and Plan focus on "efficient use" of development geothermal systems and sustainable management of the regional geothermal resource *as a whole*.

How does this policy approach affect information provisions, a resource consent applicant's AEE, related resource consent conditions and information requirements and the role of the peer review panel? If the Regional Council considers "the extent to which the rate and volume of

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[113] *Waikato Regional Policy Statement* (2016) part B at [9.3(b)] and [9.3.1] explanation. For further on "controlled depletion" and weak sustainability for large-scale geothermal resource use, see Blair Dickie and Katherine Luketina "Sustainable Management of Geothermal Resources in the Waikato Region, New Zealand" (from proceedings World Geothermal Congress, Turkey, April 2005) at [5.2] and [6.1]; and Burnell and others (2016), above n 97, at [2.3].

[114] *Waikato Regional Plan* (2007) at [7.2.1] and [7.4] policy [3].

[115] *Waikato Regional Policy Statement* (2016) part B at [9.3] explanation. Emphasis added.

[116] Personal communication with Katherine Luketina, Waikato Regional Council, geothermal scientist and geothermal policy advisor (November 2020). In the proposed version of the geothermal section of the *Waikato Regional Policy Statement* (Change No.1) geothermal developments had to be sustainable for at least 100 years. However, resource consent holders submitted that this was too restrictive and an agreement was reached to remove timescales so that *Waikato Regional Policy Statement* [9.3(b)] was substituted. See also Luketina (2010), above n 86, at [5.5].

take will be controlled so as to manage the *adverse* effects on the geothermal system", is system depletion itself considered an adverse environmental effect?[117] If so, how is the adverse effect of system depletion avoided, remedied or mitigated? The Policy and Plan are silent on these issues except to say that Regional Council will *consider* adverse effects in the context of controlling the rate and volume of take and that the Policy accepts the resource will be depleted in development systems.

The large-scale take, use and discharge of geothermal energy and water within development geothermal systems must be efficient.[118] The Plan requires a precautionary approach to geothermal resource management but only in relation to the reclassification of research geothermal systems;[119] the environmental effects of geothermal resource use on "*other* natural and physical resources", including overlying (built) structures[120] and regarding the establishment and review of land boundaries for protected geothermal systems.[121] The precautionary approach is not required or explicitly linked to geothermal resource use in *development* geothermal systems.[122] "Operational flexibility" and "adaptive management" are however required for the use of development systems "as appropriate".[123] It is arguable that the term adaptive management should not be used in policy and rules if in fact there is no requirement for it to be linked to the precautionary approach or sustainable use of the individual development geothermal system. It would be more accurate to simply use the term "flexible management".[124]

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[117] At [7.6.1.4] assessment criteria matter [x]. Note this is a *consideration* not a requirement.

[118] *Waikato Regional Policy Statement* (2016) part B at [9.3(a)]. "Efficient allocation" in the *Waikato Regional Plan* (2007) glossary includes "economic, technical and dynamic efficiency"; and "efficient use" is explained as "where the volume of water taken is within the actual requirements for its intended use". In respect of the Waikato Policy and Plan emphasis on efficient rather than sustainable use it is also notable that the word "conservation' is absent from both the Policy and Plan chapters for geothermal resources.

[119] *Waikato Regional Policy Statement* (2016) part B at [9.6.1] explanation.

[120] *Waikato Regional Plan* (2007) at [7.4] policy 11. Emphasis added. Resource depletion in Development Geothermal Systems does not appear to be regarded as an adverse environmental effect accept as mentioned in [7.6.1.4(x)].

[121] At [7.4] see additional implementation methods for policies 1 to 14, method (2).

[122] For example, the use of a precautionary approach is referred to in assessment criteria that the Waikato Regional Council *considers* but it is not explicitly *required*, see *Waikato Regional Plan* (2007) at [7.6.1.4(xiii)].

[123] *Waikato Regional Policy Statement* (2016) part B at [9.3.1(a)(i)].

[124] At part A objective [3.3] decision making lists at [d] that the Policy "adopts a precautionary approach, including the use of adaptive management where appropriate, towards any proposed activity whose effects may be significant or irreversible but are as yet uncertain, unknown or little understood".

The Plan requires controlled depletion of development geothermal systems to occur through "stepped production based on reservoir modelling". The objective of controlled depletion is interpreted as intending that future generations will have "equitable access" to the resource.[125] A "key aspect" of managing the resource so that "the reasonably foreseeable needs of future generations are not compromised" is through (among other things): [126]

> recognising that future generations may have more and better choices than present generations as to how to meet their energy requirements, and therefore allowing controlled depletion in some geothermal systems while not compromising the ability of future generations to meet their reasonably foreseeable needs.

Yet, the Policy or Plan provide no information or guidelines on what "equitable access" requires in relation to rates of geothermal resource exploitation; nore are sustainable-use timeframes specified. It is arguable that longer-term planning such as the 100 plus year projections for climate change should be a routine part of geothermal resource planning policy.[127] Resource consent timeframes on consents which are not required under policy to show sustainable use or to predict the state of the resource at the end of the consent (plan for subsequent uses) are insufficient to ensure depleted geothermal resources will necessarily provide for future generations.[128]

The Plan's "assessment criteria" list matters that the consent authority "considers in the assessment of a discretionary activity" (for large takes of geothermal ground water and energy from development geothermal systems) as including:[129]

> 1 the extent to which the proposed development affects the capacity of the system as a whole and its ability to provide for the reasonably foreseeable needs of present and future generations; and

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[125] *Waikato Regional Plan* (2007) at [7.3] see principal reasons for adopting objectives, objective [1].

[126] At [7.2.1].

[127] See Ministry for the Environment *New Directions for Resource Management in New Zealand* (June 2020) at 133.

[128] Note the Natural and Built Environments Bill cl 14 "Strategic Directions" suggests the purpose of the Act, including its environmental limits and the topics that national planning provides for must include strategic goals such as (cl 14(b)) "*how* the well-being of present and future generations is to be provided for within relevant environmental limits"; see at Ministry for the Environment *New Directions for Resource Management in New Zealand* (June 2020) at 70. Emphasis added.

[129] *Waikato Regional Plan* (2007) at [7.6.1.4 (ix) and (x)]. Note "adverse effects" is not linked to any policy explanation about resource depletion being an adverse environmental effect, and mitigation and remediation for environmental effects is not prefaced with "adverse" (environmental effect). The above is also the only *Waikato Regional Plan* reference to "long-term" and "achieve sustainable management of the resource" (singular geothermal system, as opposed to sustainable management of the *regional* geothermal resource).

> 2 the extent to which the rate and volume of take will be controlled so as to manage the adverse effects on the geothermal system and overlying environment over the long term and achieve sustainable management of the resource.

Yet, these matters are not Plan rules for the consent applicant; rather, they are broadly stated matters the decision-maker *considers*. The Plan states that these matters must be read in conjunction with the information requirement rules for "development of deep geothermal reservoirs" which require information on "actual and potential effects" on "geothermal resources" and on "subsurface effects".[130] These rules are found not within the geothermal resource chapter of the Plan but (arguably obscurely) in another chapter for information requirement rules for "water and geothermal" resources. These rules require (among other things): information defining the maximum volume of water to be taken as a minimum per day and per year, the rate at which the water is to be taken and what effects the activity will have on the environment.[131] Needless to say, perhaps the largest practical constraint on a geothermal system's depletion rate is the daily maximum tonnage of geothermal water and fluid consented/permitted. The "explanation" sections of the Policy state that "Management directions for geothermal systems are determined in a way that will ensure different demands on the resource can be satisfied *as appropriate*" and that: [132]

> The intention is to enable large-scale efficient and sustainable take, use and discharge of geothermal energy and water in Development Geothermal Systems, recognising that this will result in the depletion of the energy in the system (i.e. mining of the heat).

However, none of these explanations or the parts of the Policy to which they relate explains geothermal resource renewability or hint at the extent of the natural resource or environmental issues involved in large-scale resource exploitation. The Plan's geothermal chapter "background and explanation" section simply states: "Further background information on the geothermal resource within the Waikato region, including the uses and values associated with the resource, can be found in the Waikato Policy and other documents produced by the [Waikato Regional Council]".[133] Consequently, a layperson's reading of the Waikato Policy and Plan geothermal chapters would not suspect that large-scale exploitation would have any

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[130] *Waikato Regional Plan* (2007) at [8] information requirements [8.1.6.1] for effects and mitigation at [b] actual and potential effects [ii].

[131] At [8.1.2], [8.1.2.1(c), (d) and (j)] and [8.1.6.1(b)(ii)].

[132] *Waikato Regional Policy Statement* (2016) explanation for [9.1.12] and [9.3]. Emphasis added.

[133] *Waikato Regional Plan* (2007) at [7.2.1].

potentially detrimental effect on a geothermal system because geothermal resources are understood to be renewable.[134]

Policy and rules do not require a resource consent applicant or consent holder to explicitly address the matter of resource depletion; moreover, regional councils do not publicly report on individual development geothermal system depletion rates. If resource depletion is an adverse environmental effect on a natural and physical resource which affects present and future generations, how is the justification for the Policy and Plan's lack of attention to it equitably and legally sound? When one considers the public function of property in natural resources as is reflected in both RMA s 35 (particularly subs (2A) – (5)) provisions for public access to official documents and records, including about resource consents) and the explicit reference to intergenerational access to resources in its definition of sustainable management in s 5, these silences in the Policy and Plan are concerning.

In improving its Policy and rules regarding sustainable use and the renewability of geothermal systems subject to large-scale development, the Waikato can learn from the better expressed and explained Bay of Plenty geothermal Policy. Resource consent holders and regional councils should also make information and data about the depletion rates on individual geothermal systems routinely and publicly available. In the same way that a resource consent/permit has a maximum daily allowed take of geothermal fluid and water, a rule for a resource consent should require an agreed "expected state" of the resource at the end of the consent period which is regularly monitored and reported on. The Policy objective for an SMP's "provision for subsequent uses" of a geothermal system[135] should explicitly follow through to Plan rules and resource consent conditions.

Below, Table 4.1 provides a summary overview that compares the main features of the Northland, Bay of Plenty and the Waikato region's geothermal policy and plan rules discussed above.

[134] Note upon it being brought to their attention, geothermal policy development and geothermal science staff at the Waikato and Bay of Plenty regional councils expressed surprise at how little attention sustainable use and resource renewability aspects for geothermal resources *actually* receive in the Waikato Policy and Plan; from personal communication (September 2021).

[135] *Waikato Regional Policy Statement* (2016) at [9.3.1(a)(i)]. See further regarding post-production stored heat calculations for geothermal development systems in Bart Van Campen and Harpa Petursdottir "Geothermal Sustainability Regulation in Iceland and New Zealand" (from proceedings European Geothermal Congress France, September 2016) at [2.4] points (1) – (3) regarding resource estimation methods.

Table 4.1 Regional Policy and Plans for Geothermal Resources Compared

REGIONAL POLICY OR REGIONAL PLAN RULE	NORTHLAND	BAY OF PLENTY	WAIKATO
Iwi and/or hapu tangata whenua associated with large-scale regional geothermal resource development named within Regional Policy Statement or Regional Plan Geothermal Resource section/chapter	No	No	Yes
Information challenges identified with geothermal resource management	No	Yes	Yes
Information policy in relation to geothermal resource management	No	Yes	Yes
Information restrictions in relation to geothermal resource information	No	Yes	Partial
Geothermal system classifications	No	Yes (differs from Waikato region's classifications)	Yes
Geothermal system boundaries identified	No	Partial	Yes
Description of geothermal resource properties in relation to sustainable management	No	Yes	No
Sustainability goal for geothermal resources	No	Yes	Yes
Emphasis on sustainable use or efficient use	None	Sustainable use	Efficient use

REGIONAL P**OLICY OR** R**EGIONAL** PLAN R**ULE**	**NORTHLAND**	**BAY OF PLENTY**	**WAIKATO**
Sustainable use of geothermal resources defined	No	Yes	No
Timescale in relation to sustainable use	No	Yes	No
Efficient use defined	No	No	Yes
Renewability defined in relation to geothermal resource properties	No	Partial	No
Consent-holder information requirements to measure future, predicted state of the resource at end of resource consent holding period for subsequent uses of the resource	No	No	No
Peer Review Panel requirement	No	Yes	Yes
Iwi/hapu representation on Peer Review Panel	No	No	Yes

While the regional differences in managing industrial geothermal resource use are notable in themselves, overall the differences in Table 4.1 are the result of RMA requirements and processes. That is, although they must give effect to national direction under the RMA, mandatory regional policy statements are developed without central government oversight, regional plans are non-mandatory, and while definitions of terms may be adopted from the RMA itself, definitions (eg for working terms) are not mandatory for these instruments.

III The Renewability of Geothermal Resources

Because many of the legal information provisions for geothermal resource management examined are designed to manage and monitor controlled depletion of the energy and fluid in development geothermal systems by resource consent holders, this section explains controlled depletion and the physical components of New Zealand's high-temperature geothermal systems. An understanding of resource depletion is necessary if one is to consider whether or not public understanding of geothermal resource management issues and the reasonably foreseeable needs of future generations may be compromised by current policy. Sustainable management (as the RMA's principal objective) cannot be achieved without the legal requirements for information, accountable information management processes and nationally responsible consent-holder monitoring and enforcement. The thesis suggests that the natural resource bargain for geothermal resource development does not adequately provide for public functions of property in natural resources under the RMA primarily due to the large degree to which resource consent holders (compared to the public or wider interests) control geothermal resource management policy language and definitions and industry's overall dominance in policy and rule development—particularly in the Waikato region which has over 90 per cent of New Zealand's high-temperature resources.[136]

As noted, geothermal energy is defined as renewable under the RMA.[137] This is an internationally accepted description of geothermal energy because it is maintained by a continuous energy flow; nevertheless, "renewable" in the case of geothermal resources is an

[136] See for example, the differences in policy explanations in the first- and second-generation *Waikato Regional Policy Statements* (2000) and (2016). Submissions on proposed policy are illuminating in Waikato Regional Council *Waikato Policy Statement – Proposed Change No. 1 – Geothermal: Hearings Committee Decisions Report* (Environment Waikato Document No. 921801, 12 June 2004). Note multiple references by the Resource Management Review Panel for a need for a stronger focus on decision-making about resource use, development and protection at a strategic level rather than at resource consent level in Ministry for the Environment *New Directions for Resource Management in New Zealand: Report of the Resource Management Review Panel* (June 2020); for example, see at 13, 224, 228], and 263.

[137] RMA 1991 s 2(1).

oversimplification.[138] First, when discussing the renewability of any energy source, the timeframe for renewability must be specified. For example, coal deposits are renewable, but over geological ages and not over a human timeframe. Most energy sources generally classed as renewable are either essentially unaffected by use (solar, wind, wave or tide) or take no more than a few months or years to recover their energy-producing capacity (hydro, biomass). For an energy source to be renewable, the rate of input of energy must be the same or greater than the rate of extraction over the specified timeframe.

Due to the usually decades-long timeframe for geothermal resource renewability after large-scale resource extraction has occurred, there has long been debate in New Zealand and elsewhere about whether geothermal resources are indeed renewable.[139] The chosen mode of energy utilisation, the rate of resource extraction from a system and a system's particular hydrothermal dynamics will all affect the rate at which the system's energy (heat) and extractible fluid (water and steam) renew naturally. There are many examples of commercial projects where the rate of production exceeds natural heat and fluid recharge rates, and hence exploitation is finite.[140] This is the case for all industrial-scale geothermal developments in New Zealand where extraction rates usually far exceed a system's natural recharge rate. As an example, O'Sullivan and others examine the renewability of the Wairakei-Tauhara geothermal system in the Waikato region. Its development started in 1958:[141]

> [C]urrent production of geothermal heat from the Wairakei–Tauhara system exceeds the natural recharge of heat by a factor of 4.75. Thus, the current rate of heat extraction from Wairakei–Tauhara is not sustainable on a continuous basis, and the same statement applies to most other geothermal projects. Nevertheless, geothermal energy resources are renewable in the long-term [sic] because they would fully recover to their pre-exploitation state after an extended shut-down period.

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[138] Gudni Axelsson "Sustainable Geothermal Utilization – Case histories; Definitions; Research Issues and Modelling" (2010) 39 Geothermics 283-291 at 284.

[139] Historically see Ministry of Energy, Oil and Gas Division *Summary of Public Submissions on 'A Review of the Role of Geothermal Resources in New Zealand'* (January 1984) at 6. The Department of Lands and Survey believed geothermal resources were "basically non-renewable" while the Ministry of Works and Development believed the source of geothermal energy was "very long-lived, to the extent of being renewable". In 2004, parties involved in developing regional geothermal policy in the TVZ (including regional councils) had similarly differing opinions about the renewability of geothermal resources; see policy development submissions in Waikato Regional Council *Waikato Policy Statement - Proposed Change No. 1 – Geothermal: Hearings Committee Decisions Report* (Environment Waikato Document No. 921801, 12 June 2004).

[140] Burnell and others (2016), above n 97, at [2.1].

[141] Michael O'Sullivan, Angus Yeh and Warren Mannington "Renewability of Geothermal Resources" (2010) 39 Geothermics 314-320 at 314.

On the basis of a reservoir simulation of this system, the authors suggest that if production for electricity generation continues at Wairakei-Tauhara until the year 2053, "the field will recover to almost its pre-production state in 400 years": four times the total period of production.[142] Burnell and others suggest Wairakei-Tauhara can be considered "as an example of a system […] being managed to supply the energy needs of current and future generations (~100 years)", because it has sustained production for almost 60 years and was recently consented for another 30 years.[143] Yet, if at the end of the 90-year production period, a 400-year resting period is required, how is such resource use considered sustainable and how can it be considered as ensuring "equitable access" to geothermal resources for future generations? While one aspect of answering this question may include the Waikato region's policy approach of sustainable management of the *regional* geothermal resource rather than sustainable management of individual *development* geothermal systems, how do resource consent information requirements and processes take these questions into account, especially where there is no policy guidance concerning the reasonably foreseeable needs of future generations or the resting or rotation of geothermal systems?

While there has been considerable debate—but no complete consensus—in the international literature about sustainability in the geothermal context, production horizons are often discussed.[144] Production horizons are relevant because large geothermal developments are heavily front-loaded from an investment perspective. A prerequisite for a large development is knowledge on the generating capacity of the reservoir (the part of the geothermal system where extraction wells are drilled). A number of wells must be drilled and the capacity of the field is tested prior to full investment. Thus, considerable investment in the field and a long period of testing are required before the plant construction phase and before any financial return from energy production is obtained. Once capacity is confirmed and resource consents are granted for resource development, a resource developer is focused on gaining a return on its investment.[145] A production horizon and the timeline of most commercial considerations are generally in the same order of time (around 30 years). The predictive ability of technical modelling simulation (maximum 30 years) regarding resource capacity and commercially

[142] At 314-320 at [7].

[143] Burnell and others (2016), above n 97, at [4.2].

[144] At [2.1].

[145] The role of equity finance and public shareholder investment in energy development is discussed further in chapter seven.

sustainable resource depletion rates largely matches the typical commercial timescale and production horizon of a commercial development. While the unique properties of each geothermal system mean the sustainable rate of extraction on each system varies and changes over time (in relation to new information which comes to light about a systems' properties), all geothermal energy projects require a certain level of commercial sustainability: a matter of substantial weight in resource management and resource consent decision-making.[146]

Axelsson and others propose that sustainable production of geothermal energy from an individual geothermal system can be understood as follows:[147]

> For each geothermal system, and for each mode of production, there exists a certain level of maximum energy production, E_o, below which it will be possible to maintain constant energy production for a very long time (100-300 years). If the production rate is greater than E_o it cannot be maintained for this length of time. Geothermal energy production below, or equal to E_o, is termed *sustainable production* while production greater than E_o is termed *excessive production*.

This definition applies to the total extractable energy and it depends in principle on the nature of the geothermal system in question. It does not consider load factors, utilisation efficiency, economic aspects, environmental issues or technological advances.[148] The value of E_o may be expected to increase with time through technological advances such as deeper drilling. Additionally, the definition is dependent on different modes of production (the use of injection or periodic production for example).[149] It is also a definition based on a much longer time scale than a customary economic timeframe for geothermal power plants (usually 30 years) which is generally the timeframe when the production potential of a geothermal system is being assessed for investment purposes. The value of E_o is not known at the onset of production. It must be estimated through modelling, on the basis of exploration and on production data as these become available.[150] Axelsson and others warn that excessive production from a geothermal

[146] For an example of commercially unsustainable geothermal development in New Zealand see Schofield (2012), above n 86, at 112-115.

[147] G Axelsson and others "Sustainable Production of Geothermal Energy: Suggested Definition" (2001) 43 International Geothermal Association – News Quarterly (January-March 2001) at 1 and 2.

[148] Axelsson (2010), above n 138, at 284.

[149] At 284 and 285-287.

[150] At 283-291. Axelsson explains, at 284 and 287, modelling studies – which are performed on the basis of available data on the structure and production response of geothermal systems – are the most powerful tools for estimating sustainable potential. These are based on conceptual ideas regarding the size of a geothermal system and its fluid state (pressure, temperature, gas content, and salinity), as well as knowledge of the characteristics of comparable systems.

system can indicate overinvestment in wells and power plant equipment; inevitably, an energy developer will be forced to reduce production.[151]

The main methods used to estimate resource capacity in the regulatory context in New Zealand are: probabilistic stored heat calculations; power density calculations with a variation as to "proven resource" (around successful tested wells) and probable (estimation/extension of the area beyond drilled area); and production scenario analysis using computational reservoir models.[152] The response of the system to production gives information on how the system will behave in the future; an estimate of the generating capacity of the system can then be made by for example applying modelled reservoir simulation. The confidence level of such predictions depends on the length of the field observation time and on the amount of production from the resource. If production in the field test is only a small fraction of the capacity of the field, there will be large uncertainty in the predicted capacity of the field. Furthermore, the accuracy of the predictions is strongly dependent on the prediction time applied. Simulation methods can give reasonable predictions for 10-30 years but predictions made for 100-300 years are usually associated with large uncertainties.[153]

Axelsson suggests four modes of sustainable use:[154]

1. constant production below the rate of renewal;
2. step-wise increase[s] in production;
3. intermittent excessive production with breaks; and
4. reduced production after a shorter period[s] of heavy production.

Stepped production of large-scale commercial use of geothermal systems is considered best practice internationally when estimating both the commercial capacity of the resource and the maximum level of its sustainable use.[155] In the earlier decades of geothermal resource exploitation, it was assumed that the benefit of size was valid for geothermal power plants and that large developmental stages were more economic than smaller developmental stages. In this respect, a mixture of utilisation modes was used in New Zealand's early days of geothermal

[151] Valgardur Stefansson and Gudni Axelsson "Sustainable Utilization of Geothermal Resources through Stepwise Development" (from proceedings World Geothermal Congress, Turkey, April 2005) at Abstract.

[152] Van Campen and Petursdottir (2016), above n 135, at [2.4].

[153] Stefansson and Axelsson (2005), above n 151, at [3].

[154] Axelsson (2010), above n 138, at 283-291.

[155] Stefansson and Axelsson (2005), above n 151, at [3].

resource development and before current policy developed under the RMA. However, management experience of a number of these geothermal developments means that New Zealand's geothermal policy now requires stepped production.[156] Therefore, both economic considerations and sustainable resource management favour development of geothermal resources in relatively small steps.[157] Nonetheless, Burnell and others suggest a geothermal development plant on the Wairakei-Tauhara field (consented in 2010) may best fit into Axelsson's sustainability mode-3 above: "excessive production".[158] Why this is so and why "excessive" rates of resource production are consented are explained below.

A Interpretation of RMA 1991 s 5 for Geothermal Development Systems

Overall, in recent years the courts and decision-makers take a routine approach to applying and interpreting RMA s 5 to geothermal resource management, whether regarding geothermal policy development or large-scale development of geothermal resources under resource consents.[159] That is, a region-wide view of the geothermal resource and an "overall broad judgment" approach is taken.[160] While an overall broad judgment approach is yet allowed for resource consent decision-making, where a s 104 assessment is subject to Part II of the Act, this research suggests that more directive policy is justified in order to require decision-makers to consider environmental bottom lines for geothermal resource exploitation.[161]

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[156] Bay of Plenty *Regional Policy Statement* (2014) at [4] objective [8] refers to "staged development"; while the *Waikato Regional Policy Statement* (2016) part B at [9.3.1] uses the term "stepped production". See generally "staged development" described in Environment Protection Authority, Board of Inquiry *New Zealand King Salmon Requests for Plan Changes and Applications for Resource Consents* (22 February 2013) at [54].

[157] Stefansson and Axelsson (2005), above n 151, at [1].

[158] John Burnell and others (2016), above n 97. Compare doctoral research conclusions by Bart Van Campen "The Use of Geothermal Reservoir Modelling and Resource Assessment in Geothermal Regulation and Sustainable Resource Management" (Doctoral Dissertation, University of Auckland, 2022) chapter 5.

[159] For example, *Geotherm*, above n 2, at [74] – [78]; *Rotokawa Joint Venture Ltd v Waikato Regional Council* (*Rotokawa JV*) EnvC A041/07 (18 May 2007) at [130 – 135]; and Environmental Protection Authority *Final Report and Decision of the Board of Inquiry into the Tauhara II Geothermal Development Project* (*Tauhara II*) (Vol 1, December 2010) at [398].

[160] For leading precedent on the courts' overall broad judgment approach taken in interpreting RMA s 5 in a policy context ie. the *New Zealand Coastal Policy Statement* (2010) and subsidiary RMA planning instruments, see *Environmental Defence Society Inc v New Zealand King Salmon Co Ltd* (*NZ King Salmon*) NZSC [2014], NZSC 38, [2014] 1 NZLR 593 at [38] – [44] and [106] – [154]. For recent application of *NZ King Salmon* see *Port Otago Limited v Environmental Defence Society* [2021] NZCA 683.

[161] See *RJ Davidson Family Trust v Marlborough District Council* [2018] NZCA 316, [2018] 3 NZLR 283 at [66] – [68]. For a more general overview of the courts' interpretation of RMA s 5 see Kenneth Palmer "Resource Management Act 1991" in Derek Nolan (ed) *Environmental and Resource Management Law* (5th ed, LexisNexis, 2015) at [3.22] – [3.44].

In *Geotherm*, Whiting J signalled that the "comprehensive review of geothermal policy in the Waikato Region" (part of which was the topic of that case) introduced "a number of new concepts and approaches" which "indicate a shift in thinking".[162] One of these was "the allocation of geothermal resource[s] over time".[163] Although sustainability and resource renewability were not discussed in *Geotherm*, the earlier (first-generation) Waikato Regional Policy Statement explicitly defined sustainable use and geothermal resource renewability, emphasising that sustainable management of a resource requires understanding of the characteristics of the resource.[164] That Waikato Regional Policy went to considerable lengths to describe these characteristics and the adverse environmental effects that could result from resource development, including the environmental effects on a *geothermal system* subject to exploitation.[165]

The policy development case law for the current Waikato Policy and Plan emphasises a "whole system" approach and "integrated resource management".[166] The policy's de-emphasis of adverse environmental effects on development geothermal systems themselves is almost wholly ignored both in current policy and in decision-making. Policy, rules and decision-makers imply that resource depletion and rates of depletion are best decided by technical experts during the resource consent application and development phases. For example, cases regarding resource consent application matters look at sustainable management of the regional resource, adverse environmental effects largely regarding surface feature, or surface characteristic degradation and overlying (built) environment effects such as a result of land subsidence resulting from system exploitation.[167] Positive environmental effects strongly emphasise renewable energy development goals, energy efficiency and conservation and contribution to climate change.[168] While the *Geotherm* case's lack of discussion on the detrimental (energy depletion) effects on a development geothermal system may seem surprising, it stems from the policy's allowance of controlled depletion of development

[162] *Geotherm*, above n 2, at [51].

[163] At [51].

[164] See the first-generation Waikato *Regional Policy Statement* (2000) at [3.7].

[165] At [3.7].

[166] *Geotherm*, above n 2, at [134]; and *Rotokawa JV*, above n 159, at [122] – [128] and [453].

[167] *Contact Energy Ltd v Waikato Regional Council* (*Contact Energy Ltd*) EnvC Auckland A04/2000 (24 January 2000) at [141], and *Rotokawa JV*, above n 159, at [139] – [142].

[168] See for example *Tauhara II*, above at 159, at [356] – [357] and [403].

geothermal systems and the rates of depletion being noted in the policy as being decided through resource consent processes.

Despite this policy silence—and given the strong RMA s 5(2)(a) directive to sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations—it remains puzzling that there is almost no case-law discussion of what future generations' energy needs might be and how geothermal resources might be expected to meet them in relation to a development geothermal system's rate of depletion and its given renewability timeframe.[169] The repeated overall broad judgment approach to interpreting s 5 fits conveniently with the Waikato region's policy direction for sustainable management of the *regional* geothermal resource rather than sustainable management of individual development geothermal systems. The fact is, development geothermal system depletion under individual resource consents does not fit a description of sustainable use because full system recovery at current extraction rates is not possible within human timescales. However, neither the Policy nor the Plan states this fact. Waikato regional policy and judgments and decisions interpreting RMA s 5 also leave this point unaddressed. Consequently, excessive rates of production are regularly consented in New Zealand,[170] and, furthermore, anyone reading the Policy, Plan or geothermal development case law would struggle to see this reality or understand its implications regarding RMA s 5(2)(a).

While the Environment Court clarified some policy development matters such as those regarding multiple tapper policy and policy for a preference of reinjection of used geothermal fluid,[171] the geothermal consent holders submitting on proposed regional policy did not appeal to the Environment Court on the matters of "sustainable use" of individual development systems, or on definitions and explanations for geothermal resource renewability (including approximate timeframes regarding renewability). Ultimately, these matters were resolved through lengthy negotiation between (primarily) the geothermal resource development

[169] See brief mention of the needs of future generations in relation to geothermal resource exploitation rates in *Tauhara II*, above n 159, at [169] – [182].

[170] See Axelsson (2010), above n 138, at 283-291. Note while Axelsson's sustainable use mode 3 (intermittent excessive production with breaks) may not be directly applicable, New Zealand's policy encourages stepped-production (see Axelsson's mode 2). Notwithstanding, a resource consent holder is ultimately stepping production towards an excessive rate, which is not "intermittent with breaks" unless one considers the end of a consent's duration to be the "break".

[171] See *Geotherm*, above n 2.

consent-holder companies and the Waikato Regional Council.[172] Given that the current Policy and Plan—which make no mention of geothermal resource renewability, provide no working definition for sustainable use of development geothermal systems and no explanation or descriptive guidelines about controlled depletion—have been finalised, it appears that the courts and decision-makers (eg the Environmental Protection Authority, (EPA)) provide no reasoned discussion about geothermal system renewability rates or future generations' possible energy needs. Both the Policy and Plan either have nothing to say or are optimistic regarding what the energy needs of future generations might entail in relation to geothermal resource depletion rates;[173] nor are there policy or rules about the resting or rotation of geothermal systems which are, or have been, subject to large-scale exploitation.

What then is the role of a peer review panel in managing a resource consent and its associated system management plan on behalf of a regional council if sustainable use is not within its review ambit? What does efficient use of development systems entail? Does efficient use encompass looking to future energy needs? While the policy development history and case law regarding geothermal development warrants separate and thorough attention in itself, the matter of sustainable management and efficient use are brought into focus here primarily to show whether and how they have bearing on legal requirements for information and on information-related processes and if they do, how do existing requirements and processes measure up against a full reading of RMA s 5.

—For instance, in an EPA Board of Inquiry Decision, Judge Whiting responded to significantly different expert opinions about the rate of a particular development geothermal system's renewability and future generations' access to the geothermal system under development with the generalised comment that "In either case, future generations will have access to the

[172] Although parties without commercial interests also submitted on the proposed policy it was largely geothermal resource consent holders (and those associated with the geothermal industry) who persisted in negotiations with the Waikato Regional Council to ensure their submissions on the proposed policy were accepted. See for example, Waikato Regional Council "RPS and WRP Geothermal Appeals Position Paper: Allocation of the Geothermal Resource Over Time" (Report to the Parties, File No. 22 01 62, 23 07 02, 1 April 2005); and the Mighty River Power Ltd and Waikato Regional Council *Notice of Appeal to Environment Court Against Decision on Proposed Policy Statement* (23 July 2004) (Waikato Regional Council copy, accessed 18 November 2020).

[173] See *Waikato Regional Policy Statement* (2016) part B at [9.3(b)]; and *Waikato Regional Plan* (2007) at [7.2.1] key aspects of managing the regional geothermal resource include "Recognising that future generations may have more and better choices than present generations as to how to meet their energy requirements, and therefore allowing controlled depletion in some geothermal systems while not compromising the ability of future generations to meet their reasonably foreseeable needs".

resource".[174] One assumes that the decision-makers approach was taken because nothing in the Policy or Plan required more.

If excessive production is both allowed and consented, more future-focused policy and plan provisions should be developed. These would require the following: consent-holder information and data about depletion rates; for this information to be publicly available as a matter of course (not simply available on request); for development geothermal systems subject to exploitation to be rested; and their use rotated after set time periods. Public awareness and understanding should also be encouraged through policy and plan explanations of resource characteristics and descriptions and definitions of renewability and sustainable use which are unique to large-scale exploitation of geothermal resources. To improve the current, overall broad judgement approach taken in resource consent decision-making, national-level planning for renewable energy developments could also prescribe directive environmental bottom lines regarding geothermal resource exploitation.

Doctoral research exploring the use of matauranga Māori in geothermal resource development and Māori perspectives of "sustainability" can also feed into future resource descriptions, definitions and information provisions for sustainable use.[175]

IV The Peer Review Panel – History, Rationale and Development

This section explores the use of peer review—an essential tool used to monitor and enforce geothermal resource consent conditions. The panel's function is also an example of an information process developed to manage a natural resource use and environmental effects of use: ie the terms of the natural resource bargain.

According to the Waikato Policy, an information-related requirement for geothermal system management plans (SMP) is that they are "independently peer reviewed".[176] A peer review panel (PRP) is established "for the purpose of assisting the consent authority in managing the

[174] *Tauhara II*, above n 159, at [182]; see also [169] – [185].

[175] See Nona Taute "Integrating Mātauranga Māori in Geothermal Development" (Doctoral Dissertation, University of Auckland, forthcoming 2023); Dan Hikuroa, Te Kipa Kepa Morgan, Darren Gravley, and Manuka Henare "Integrating Indigenous Values in Geothermal Development" (from proceedings International Traditional Knowledge Conference, Auckland, June 2010) at 149-152; and Daniel Hikuroa, Angela Slade and Darren Gravley "Implementing Māori Indigenous Knowledge (Matauranga) in a Scientific Paradigm: Restoring the Mauri to Te Kete Poutama" (2011) MAI Review 3.

[176] *Waikato Regional Policy Statement* (2016) part B at [9.1] and [9.1.12(d)].

geothermal system".[177] A PRP of independent experts and tangata whenua is established for each development geothermal system. It will:[178]

> a) assess the commencement, ongoing exercise and effects of resource consents against achieving the objectives of the system management plan, and the continued use and application of the system management plan;
>
> b) make recommendations for updating and reviewing the system management plan and changes to resource consents that are operative within that system; and
>
> c) report to Waikato Regional Council on a) and b), with findings being publicly available.

The consent authority uses PRPs to ensure the necessary knowledge and skills are available for auditing the management of geothermal systems subject to development.[179] The panel's primary function is to ensure the consent holder's science and technical understanding and interpretations are scientifically and technically robust.[180] With the knowledge gained from review work, the peer reviewers help the consent authority identify and rank the risks which may affect the sustainable management of individual geothermal systems.[181] The scope of the panel's responsibility does not extend to verifying data or reports or replication of the science and data produced in consent-holder reports. Although panels are not expected to create alternative technical models or interpretations,[182] they may request further information from the consent holder and ask that additional specialists be seconded to assist the panel.[183] From time to time, the panel may also commission technical studies for the proper execution of its functions.[184]

To enable the PRP to fulfil its role, resource consent conditions generally require the consent holder to:[185]

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[177] At part B [9.3(c)(ii)].

[178] At part B [9.3] and [9.3.3].

[179] *Waikato Regional Plan* (2007) at [7.4] additional implementation methods for policies 1 to 14 at [5] and [method 5].

[180] Jim McLeod "The Role of Peer Review Panels in the Management of the Waikato Geothermal Resource" (from proceedings New Zealand Geothermal Workshop, November 2012) at [2].

[181] At [2].

[182] At [2].

[183] See for example Waikato Regional Council "Ohaaki System Management Plan 2015" general condition at appendix B [1.4].

[184] At appendix B [1.4].

[185] McLeod (2012), above n 180, at [2]. Note this list is a summary of resource consent requirements by McLeod, not a precise list of Plan rules.

- gather and collate data and information about the effects of authorised activities;
- describe and record the state of the geothermal system**,** before, during and after the exercise of the resource consents;
- develop and maintain, using compiled resource data, a geothermal system management plan; and to
- develop conceptual and mathematical models projecting the development of the geothermal system over time.

Resource monitoring data is provided regularly (monthly or sometimes every three months) to the consent authority. Ongoing data and data interpretations are used to maintain the SMP. A PRP will meet together at least annually to review the data and reports provided by the consent holder. A panel will liaise with the relevant regional council and consent holder regarding any questions and/or recommendations, its satisfaction with the consent holder's compliance with consent conditions and the SMP. Although broad, panel responsibilities are limited to report and data review, advice and recommendations. They do not include consent authority decision-making.[186]

The regulator selects PRP members. The consent holder may comment on its satisfaction with the ability and expertise members require for the role. Panels comprise up to four independent technical experts who have recognised experience in geothermal resource monitoring, reservoir management or related environmental effects. Relevant tangata whenua usually appoint one of more representatives. A proactive resource consent applicant will engage with relevant tangata whenua at the resource consent application phase. Indeed, arrangements to access a geothermal system may rely on tangata whenua agreement and involvement in management matters. The Policy and Plan do not say how tangata whenua will appoint their PRP representative. Presumably, tangata whenua who are identified with regional geothermal resources and as listed in the Policy and Plan would also be identified on record under RMA s 35A and so a consent authority and/or resource consent applicant would engage tangata whenua on the matter using information listed under these sources. [187] The need for panel members to avoid any conflict of interest with the consent holder is a relevant and important concern in New

[186] RMA 1991 s 34. A basic rule of statutory construction and of the common law is that a body empowered to carry out a decision-making function – for example, a regional council – may not delegate or divest of that function without express authority (delegatus non potest delegare); see Kenneth Palmer *Local Authorities Law in New Zealand* (Thomson Reuters, 2012) at [2.4.1].

[187] Note that in *Tuwharetoa* (*Tuwharetoa Māori Trust Board v Waikato Regional Council* [2018] EnvC 093 discussed in chapter three) the consent authority failed to select tangata whenua representation on the peer review panel.

Zealand's small pool of geothermal experts, however there are no plan rules or public conflict of interests registers to manage this.

As the Waikato Regional Council had little technical geothermal management experience before the passing of the RMA,[188] it introduced the peer review as a regulatory monitoring function in 1992 in response to the extended responsibility placed on it to sustainably manage regional geothermal resources under the Act. At this time, it recognised that:[189]

> The regional council is a resource policy and regulatory agency; the council is not, and cannot be, expected to provide information and expertise necessary to prescribe to resource users the ways in which specified environmental outcomes are to be achieved. Rather individual [geothermal energy] developers as part of their operations should establish the most efficient and appropriate methods and techniques for achieving council requirements. [Such an] approach is endorsed by the fourth schedule of the RMA [which requires an assessment of environmental effects to be submitted with a resource consent application]. This outcome driven approach […] gives developers the flexibility to develop projects so that individual site characteristics, innovation and the best practicable methods can be used. *Monitoring and enforcement of policy becomes critical to ensure these stated [RMA] outcomes are met.*

The main issues and justification for selecting the peer review structure included: the range of specialist knowledge needed to effectively understand the resource (geology, geochemistry, geophysics, reservoir engineering and reservoir modelling); the issue of keeping the specialist knowledge current and maintaining a critical mass of knowledge; scarcity of available geothermal specialist knowledge; access to and management of geothermal resource material, data and information; and the costs of running an effective geothermal science and technical review team, how such costs would be funded and the amount of work required to be done.[190]

Under the RMA, there was a dramatic shift in the role of central government management of natural resources. The autonomy of regional authorities to decide policy, allocate resources and manage the environment within regions increased.[191] It is also pertinent to note that during the

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[188] *Geothermal Management Strategy: Issues and Options* (1992), above n 100; and McLeod (2012), above n 180, at [1.1]. Note Brian White *Case for New Zealand Membership of the International Partnership for Geothermal Technology* (New Zealand Geothermal Association and East Harbour Energy Ltd, August 2011) at 22 states use of peer review panels to review the performance of geothermal resource developers predated the RMA 1991.

[189] *Geothermal Management Strategy: Issues and Options* (1992), above n 100, at [2]. Emphasis added.

[190] At [1.1].

[191] Kenneth Palmer "Resource Management Act 1991" in Derek Nolan (ed) *Environmental and Resource Management Law* (LexisNexis, 2015) at [3.71]. See also Trevor Daya-Winterbottom "Sustainable Management: A Sustainable Ethic?" (from proceedings International Union for the Conservation of Nature, Academy of Environmental Law Colloquium, Baltimore, USA, July 2012) at 5.

1990s formerly government-operated geothermal developments became privatised and subject to the management of regional authorities, where previously the government had been development owner, operator and regulator.[192] Therefore, resource management initiatives such as the PRP may have been implemented with an inherently greater management focus rather than just a geothermal science focus as large-scale geothermal management was not in the ambit of pre-RMA regional council's experience or responsibilities. Undoubtedly, an appreciation for the role science played in managing geothermal resource existed—as seen in the initial suggestions for detailed and robust accountability mechanisms put forward for consideration by the regional authority's science staff.[193] However, *which* of these suggestions would be taken up as a means of managing the resource and *how* the management-science interface would operate in achieving resource management goals for geothermal energy developments was untested.

From a policy perspective, the inclusion of the peer review panel requirement in Waikato's Policy and Plan (as discussed in the *Geotherm* case in the previous chapter) provides an example of peer view panel evolution. In 2011, responding to growing interest and demands on geothermal resources and the obligation and objectives of the Waikato Regional Council to manage geothermal resources effectively and sustainably, the Regional Council commissioned an independent *Efficacy Review* (or *Review*) of the operations and effectiveness of the PRP processes for managing geothermal resources within its region.[194] The *Review* (which was extended to include the work of geothermal PRPs in the Bay of Plenty and Northland regions) found PRPs to be largely effective in fulfilling the role expected by respective regulatory

[192] In 1992 the only operating geothermal power stations were the Electricity Corporation of New Zealand stations at Ohaaki and Wairakei. Note with the RMA's enactment the newly established Waikato Regional Council expected a competitive element to geothermal resource development but it was not expecting the extent of competition (and secrecy) that competition introduced. Prior to the RMA geothermal resource development was relatively open and collegial where the local/regional authority was seen as a broker between central-government driven development and the local/regional community. For example, in 1990 central government funded the Waikato regional authority approx. NZD 600,000.00 to manage geothermal resource development – at Ohaaki and Wairakei. Today, geothermal power stations are over NZD 700 million dollar investments, with now over five power stations in the Waikato region. However, present regulatory costs per power station are less than 0.01 per cent of such investment. Notes from personal communication with Waikato Regional Council staff member (August 2017). In terms of today's profits, privately owned publicly listed geothermal energy developer Contact Energy Ltd made a statutory profit of over NZD 78 million in 2021, a 32 per cent increase on the previous year; see Lisa Simcock "Contact Energy (ASX:CEN) to Raise AS$372M for Geothermal Power Station" *The Market Herald* (15 February 2021).

[193] Such mechanisms included *at least two* independent peer review panels per geothermal system, and resource permits being dependent on quality data being accessible and replicable by *the entire knowledge community*; see *Geothermal Management Strategy: Issues and Options* (1992), above n 100, at [17]. Emphasis added.

[194] McLeod (2012), above n 180, at [1]; Graeme Emerson and Brian Maunder *Geothermal Peer Review Panel – Efficacy Review* (report to the Waikato Regional Council, WRC#1995581, 2011).

authorities. However, process issues were identified concerning governance, management and administration.

Discussion of these findings is relevant because peer review plays a crucial role in assisting the regulator in managing geothermal resources under resource consents. The central question is whether or not the scope of the panel's role and its respective functions adequately assist the regulator in fulfilling its duty under RMA ss 5 and 35, thereby fulfilling the purpose of sustainable management of resources under the Act. The Review findings provide insight into the role and functions of geothermal PRPs—particularly, their access to resource information (including data and original files) held by a consent holder and the scope of their review power as delegated by the consent authority. Panels are also shown to be functionally part of the "regulatory relationship" between the consent authority and the consent holder analysed in the following chapter.

A Efficacy Review of Geothermal Peer Review Panels

The *Review* used a structured interview process to identify the nature and extent of concerns relating to the peer review process. Interviews covered a sample of regulatory officers, consent holder representatives and PRP chairs and panellists.[195] Although concerns were identified in categories of governance, management and administration, they all appear to stem from one central issue: that there may have been a lack of clarity as to the scope and purpose of the geothermal peer review panel's role when it was established. This lack of clarity may have perpetuated uncertainty about the regulator's (and therein also the panel's) legal duty and right to access information and data held by a consent holder to ensure the adequate technical review required for ongoing management of the geothermal resource. Furthermore, if policy and rules do not require a consent holder to use individual development geothermal systems sustainably and there is no information requirement for a consent holder to report regularly on the future projected state of the resource, consent holders may view the supply of certain information and data as unjustified.

In examining the *Review* findings, two issues are particularly relevant and both tie into the central observation above:

1. uncertainty regarding the peer review panel role and expectations, and
2. the regulatory or management "style" of peer review panels.

[195] Emerson and Maunder (2011), above n 194, at [3].

Both issues relate to the scope and purpose of the panel's role and arguably that both have perpetuated consent authorities' (and the panels') acknowledged uncertainty in requesting information and data from consent holders as part of the wider duty to gather information and monitor resource consents under RMA s 35.

First, when interviewed by the independent reviewer, various regional council staff expressed a lack of clarity and understanding (on the part of both among regional staff members and among PRP members) regarding the PRP role. Panellists commented directly on the access-to-information issue, stating there is a reluctance (on the part of some panels) to pressure resource consent holders for information and data and that there is a perception that "the council doesn't want to either, in the interests of maintaining the cooperation of the consent holder".[196] As for information-related issues, panellists also stated that the annual reports from consent holders "are sometimes long on data and short on interpretation" and that annual reports are sometimes "largely about ticking compliance boxes, rather than peer review of interpreted data".[197] Regional council staff comments on the PRP role included a perception that PRPs were not fully aware of the "big geothermal resource management picture and/or specific resource consent conditions" in making their reviews and recommendations to the regulator, that panels often seem to act "more as an advisory group than as a true 'peer review' with serious challenging" of the consent holder's annual report and that the role did not seem to include "serious and searching questions" by the panel.[198]

As regards the management or regulatory "style" of PRPs in their dealings with the consent holder, the *Review* identified that panellists acknowledged the "collegial" manner with which they interacted with consent holder representatives in making their reviews and holding meetings at which representatives were present. Many panellists considered the "flexibility" of the review process as "very important" for panel effectiveness.[199] Flexibility meant panellists "being able to overview the operations of the resource" rather than being limited strictly to consideration of specific resource consent conditions.[200] Without fostering an atmosphere of cooperation, the view amongst panellists was that the review process could "revert to one where

[196] At [5.2.13].

[197] At [5.2.6] – [5.2.15].

[198] At [5.1.11] and [5.1.12].

[199] At [4.1].

[200] At [4.1].

the consent holder responded strictly in accordance with the conditions of the consent".[201] It was acknowledged that the collegial and cooperative approach "relies on a willingness of the consent holder to go the extra mile" in the sharing of data.[202]

Having a regulatory style or policy that relies too heavily on collegiality, cooperation and process flexibility can run the risk of diminishing statutory intention and the authority of the rule of law. A lack of clear (or inconsistent) role definitions is also problematic, particularly in this context. Clear regulatory roles are critical to regulator accountability, regulated parties' compliance, predictable decisions and enforcement and regime legitimacy.[203] Poor role clarity can lead to problems such as a regulator's role expanding beyond its mandate, duplicate or contradictory regimes, gaps in regulation, monitoring or enforcement and inconsistent enforcement. A range of factors including policymakers' giving insufficient guidance about desired objectives or regulators' having functions that create conflicts of interest[204] may create a lack of clarity. Although a senior geothermal scientist's summary of the *Review* findings for the Waikato Regional Council identified council officers' responses to issues raised in the *Review*,[205] none of the responses (which were "still to be considered and developed" by the Council) specifically addressed the issue of further defining the peer review panel role from an overall strategy perspective,[206] arguably because doing so would entail re-examining the purpose and function of the region's geothermal policy overall. Instead, summary suggestions included establishing a senior management steering group consisting of general managers for policy, regulation and resource information; additions to the regulatory authority's geothermal scientist and geothermal resource officer roles; and a combined workshop, to be conducted every two years, for all PRP members and regulatory officers to further work on improving panel effectiveness and efficiency.

Since the *Review*, the processes for selecting panellists and their remuneration have evolved. Now, the consent authority rather than the consent holder selects the peer review panellists and

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[201] At [4.1].

[202] At [4.1].

[203] New Zealand Productivity Commission *Regulatory Institutions and Practices* (June 2014) at 7.

[204] At 7.

[205] McLeod (2012), above n 180, at [4].

[206] Note the *Efficacy Review* was to occur in two stages, the 2011 report being stage one: a brief scoping review to identify the nature and extent of any issues relating to the peer review process. The second stage was to be a more in-depth review following the findings of the first stage, if required. It was decided by the reviewers, and accepted by the regional councils, that a second-stage review was not required at that time; see McLeod (2012), above n 180, at [3.2] and [3.3].

panellists are paid by the regional authority via consent-holder charges under the RMA rather than directly by the consent holder as occurred initially. This change was important to reinforce the necessary independence of panels from conflict of interest with consent holders.[207]

The Bay of Plenty Regional Council appears to have responded to the *Review* findings in its Kawerau System Management Plan, primarily regarding administrative matters to strengthen process integrity around PRP functions in areas such as frequency of PRP meetings, costs associated with the panel, facilitating the role and function of the PRP, and Council's provision of "reasonable organisational and administrative support for the duration of [resource] consent(s)".[208] While the PRP purpose, functions and responsibilities are also described in detail in the Kawerau SMP, the description largely fills a gap in a description of the geothermal PRP—something which does not occur in Bay of Plenty Policy and Plan—and is largely similar to the PRP descriptions of the Waikato Region's policy and rules.[209]

Subsequent to the Waikato Regional Council's decision to use the peer review process, resource consent conditions began to include a review panel and other associated concepts such as management plans, annual reports, regular data reports and on-going conceptual and mathematical modelling of the geothermal resource.[210] As resource consents have been granted or renewed, resource consents have further refined and built upon the experience of the regional authority and consent holder. Consequently, panels are now also less likely to "sign off" on annual report issues where they believe further investigation may be required.[211]

These examples of the PRP's evolution demonstrate how changes over time occur in policy, especially where a policy mechanism such as the PRP for geothermal resource management was not prescribed in law. The emphasis placed on the role of science in environmental management in *Geotherm* and its exhortation to the Waikato Regional Council to take an active role in managing the resource as used by electricity developers has also "stepped up" the policy and regulatory oversight required. Over time, the PRP process has become more rigorous, reflecting references to the role of the panel by the Environment Court in *Geotherm* and due to

[207] Note however that regional policy or plan rules do not contain process requirements for example to manage conflicts of interest.

[208] *Kawerau System Management Plan* (2018) at [7.13.4] and [7.13.5].

[209] At [7.13.2].

[210] McLeod (2012), above n 180, at [1.1].

[211] From personal communication with Waikato Regional Council staff member (August 2016).

the increased attention paid to the peer review process by the regional authority.[212] The *Tuwharetoa* case also reiterated how resource consent oversight by relevant tangata whenua is needed, including their representation at PRP meetings, irrespective of whether or not doing so was likely to create tension for the parties involved.[213] Regional council staff affirm that PRPs are considered "a critical component of sustainable management for geothermal resources throughout New Zealand".[214]

Nevertheless, questions remain. In the Waikato, how is the PRP role defined in light of policy emphasis on *efficient use* of development systems and sustainable management of the *regional* resource? Regional policy emphasis on efficient use and resource depletion rates determined at resource consent level may indeed mean that the PRP role cannot be further defined from an overall strategy perspective because policy and rules do not provide for or require peer review panels to do more. Policy and rules do not require sustainable use of individual development geothermal systems. No timeframes for resource depletion and/or resource recovery rates are given in policy. Consent holders are not required in policy or rules to monitor and provide ongoing information regarding the future, projected state of the resource. Monitoring of adverse environmental effects of exploitation on development geothermal systems is limited to the land overlying the geothermal resource not to the geothermal system itself.

The resource management picture which emerges thus appears to suggest that private interests dominate the use and management of large-scale geothermal resource exploitation.[215] A further, related question is: If Bay of Plenty regional policy *does* require sustainable use of geothermal systems, does a PRP managing resource consents on the Kawerau geothermal system operate differently to PRPs in the Waikato region and is its role strategically different? The answer is no, primarily because although Bay of Plenty Policy, Plan and Kawerau SMP describe, define and even require sustainable use of geothermal systems (category 4 systems), production-rates are largely decided by the consent holder and PRP under the consent process. Policy is not linked to rules which require more, and so is little different to Waikato's policy

[212] McLeod (2012), above n 180, at [2]; and *Geotherm*, above n 2, at [314] and [315].

[213] *Tuwharetoa*, above n 70.

[214] McLeod (2012), above n 180, at [3.2].

[215] For insightful discussion of "short-termism" see Jonathan Boston "Protecting Long-Term Interests in A Short-Term World: An Agenda for Better Governmental Stewardship" (2017) 15 NZJPIL 93.

in practice. However, the Bay of Plenty policy overall provides greater scope for public understanding of geothermal resource management issues.

At a more general level, how can resource consent conditions be enforced if PRPs cannot verify or truly audit information and data generated under resource consents? The following sections' discussions of numerical modelling and peer review in the sciences broadly help to answer this question.

B Information Management Protocols

1 Waikato Region

Here, attention briefly returns to the geothermal information management protocol (IMP), a mandatory requirement of the Waikato Region's geothermal resource consent system management plan. The IMPs examined demonstrate consent holder (and therefore also regulator) understandings of commercial sensitivity protection for resource consent-holder-generated information and data under the RMA. Coupled with the above "policy gaps" regarding geothermal system exploitation and the limited role of peer review panels, consent-holder-developed protocols for information management under resource consent become more notable. According to the Waikato Plan, the IMP required as part of geothermal system management plans outlines:[216]

> processes for information collection, review and dissemination[;] and the protocol should clearly identify types of information that may be classified as commercially and/or culturally sensitive, necessitating specific consideration as part of any requires for information received by the Waikato Regional Council.

This rule generally echoes Policy and Plan provisions for geothermal resource information to be kept publicly available (including system management plans and peer review panel reports) in so far as such information is not "considered inappropriate for reasons of cultural or commercial sensitivity".[217] The first aspect of the above rule relates to information-flow processes for information shared between the consent holder, peer review panel and consent authority. This requirement is worded in general terms which might include processes for consent holder reporting as part of the consent holder's monitoring and reporting duties under

[216] *Waikato Regional Plan* (2007) at [7.4] implementation method for policies 3 and 4 at [1(vii)]. Note *Waikato Regional Plan* Version 2 (the *Plan's* geothermal chapter 7 update) become operative in 2008.

[217] *Waikato Regional Policy Statement* (2016) part B at [9.1.11] and [9.1.12]; and *Waikato Regional Plan* (2007) at [7.4].

the resource consent. The direction in the second part of the rule is more precise—the identification by the consent holder of information provided to the consent authority which the consent holder deems commercially and/or culturally sensitive.[218] A resource consent applicant develops a system management plan in accordance with RMA provisions, policy and rules and the regulator checks (and approves or otherwise) its content. Individual IMPs which then form part of a system management plan therefore differ between geothermal consent applicants. While all consent holder IMPs acknowledge that some information provided to the regulator will be commercially or culturally sensitive, the detail and tone of the IMPs are markedly varied as the following two examples show.

The IMP of one resource consent holder in the Waikato region states (in its entirety):[219]

> Information will be supplied to the WRC [Waikato Regional Council, the regulator] in an agreed form that meets their requirements. Hard copy or electronic documents […] are the preferred method of information transfer from [the consent holder] to the WRC. Some information collected has the potential to be commercially or culturally sensitive. Any such information will be collated separately and provided to WRC with reasons covering sensitivity. *WRC will determine* whether to restrict release of information to the public, based on its statutory obligations.

In contrast, another resource consent holder's IMP is two pages in length and takes a commercially assertive stance in attempting to control resource consent generated information and data. For example, its definition of commercially sensitive information is "any information, held or provided in any form [by the consent holder], that could enable any other party to gain knowledge, at more than a very general level, of the extent, nature, structure, and energy profile and characteristics of the [consent holder occupied] geothermal field".[220] Under a heading entitled "Dealing with commercially sensitive information" the IMP states:[221]

> As previously indicated some information collected for, or requested by, and reported to the [peer review panel] by [the consent holder], will be commercially sensitive and accordingly is information that should be protected from wider public distribution. In

[218] Like commercially sensitive information, culturally sensitive information may be protected under RMA s 42(1)(a) and Local Government Official Information and Meetings Act 1987 s 7(2)(ba), discussed below.

[219] Waikato Regional Council file for Contact Energy Ltd *System Management Plan for Wairakei – Tauhara* (May 2015) at [11.8] information management protocol. Emphasis added.

[220] Waikato Regional Council file for Mighty River Power Ltd (now Mercury NZ Ltd) *System Management Plan for Ngatamariki* (September 2014) at [1.4] appendix B information management protocol. Such information includes resistivity data; production, injection, and monitoring well temperature and pressure data; drilling data; well test data, and strata porosity data, at [1.5].

[221] At [1.8]. Emphasis added.

> order to ensure appropriate protection of commercially sensitive information the following processes will be observed:
>
> […]
>
> (b) All information identified as commercially sensitive that is provided by [the consent holder] to the peer review panel or any consent authority is provided subject to an obligation of confidence.
>
> […]
>
> (f) The peer review panel *will not report or pass on any commercially sensitive information to consent authorities*, but may report conclusions, views, opinions, and recommendations based on the analysis and consideration of commercially sensitive information to consent authorities.
>
> […]
>
> In the event that the PRP or any consent authority, receives a request for information that has been identified in accordance with this protocol as being commercially sensitive they will immediately advise [the consent holder] that the request has been received and liaise with [the consent holder] in relation to the way in which they [the consent authority] *are to respond* to that request.

A number of observations can be made about this IMP content. Most notably, although the system management plan and IMP are largely the consent holder's composition (approved or otherwise by the consent authority during the resource consent application phase), it is not for a consent holder to stipulate the terms of its regulation—in this case, restricting the Waikato Regional Council's access to information and data generated and required under a resource consent. For example, (f) above attempts to restrict the content of a PRP's communication with the consent authority. Under the RMA, the consent authority (Waikato Regional Council) has delegated a regulatory function to the PRP (monitoring and assessment of resource consent condition and system management plan compliance). The panel is not required by the RMA or by any policy to enter into a confidentiality agreement with the resource consent holder to the effect of excluding the consent authority from accessing information and data generated under a resource consent. The proprietary, commercial stance taken in the IMP is a mismatch in the context of regulated and regulator; commercial sensitivity concerns of the consent holder are acknowledged by the consent authority in the Policy and Plan. Such concerns do not imply it is the consent holder's role to direct the regulator (or a party delegated by the regulator to undertake a regulatory function) on how it should manage resource consent information and data; nor does it imply any right of "last say" by a consent holder as to release of officially held information to the public.

These IMP observations demonstrate consent holder and arguably Regional Council (or resource consenting officer) understandings concerning public access to resource information and the peer review panel role. They also highlight differences in individual consent holder positions (or posturing) within the natural resource bargain and within the regulatory relationship.

2 Bay of Plenty and Northland Regions

Northland's regional policy and rules do not include detailed regulatory requirements for large-scale geothermal resource management such as management plans and IMPs. There is only one operator generating geothermal electricity in Northland. As such, the Northland Regional Council states commercial sensitivity concerns are not raised either as information and data being identified by the consent holder as commercially sensitive or regarding public information requests and access to consent-holder-generated information held by Northland Regional Council.[222]

In the Bay of Plenty, there is no policy or rule requirement for IMPs within system management plans however, "mechanisms to ensure co-operation between all consent holders" on development systems are required.[223] The Kawerau System Management Plan (SMP) table of abbreviations lists an "IMP Information Management Protocol"; however, there is subsequently no reference to IMPs within the 88-page document.[224] Rather, there are "agreed operational protocols between consent holders and BOPRC to achieve sustainable and integrated development of the Kawerau [geothermal system]".[225] Where information agreements or information processes appear to exist between consent holders within the document (presumably as part of agreed operational protocols), they are usually referred to within the Kawerau SMP as "private, commercial agreements" to which the council is not a party.[226] Doorman and McLeod explain that with geothermal system management plans "the form and content is flexible" and that "neither the nature and form of SMPs [is] limited by

[222] Personal communication with geothermal resource consents manager, Stuart Savill, Northland Regional Council (March 2017).

[223] Bay of Plenty Regional Council *Regional Policy Statement* (2014) policy GR [7B(e)].

[224] *Kawerau System Management Plan* (2018) at [ix].

[225] At [1.2]. See also Bay of Plenty *Regional Policy Statement* (2014) policy GR [7B(e)]; and Bay of Plenty *Regional Natural Resources Plan* (2008) chapter 4 at [IM M1(e)].

[226] *Kawerau System Management Plan* (2018) at [7.7].

policy".[227] However, to explore what information requirements, processes, and/or agreements exist between consent holders and the consent authority (and/or between respective consent holders or consent holders and the Kawerau peer review panel) within the Kawerau SMP, the following exploration is made in order to—as figuratively suggested by Professor Doremus—"sniff out leaks in the pipeline",[228] that is, to track the flow of information and data under resource consents exploiting geothermal resources and particularly consent authority and peer review panel roles regarding it.

In a process facilitated by the Bay of Plenty Council, the four consent holders on the Kawerau geothermal system developed the SMP. All four are regarded as "parties to the SMP".[229] While the broad intent of the consent conditions across all four resource consents was reasonably similar prior to the SMP's development, in some cases ambiguity and inconsistency existed; thus, the SMP provided an opportunity for consistent interpretation and principles to guide resource consent implementation and interpretation.[230] The SMP does not undermine existing rights and obligations under resource consents but seeks to ensure activities are undertaken in an integrated manner.[231] It also guides future resource consent applications (including changes to existing consents and review of consent conditions) where consent conditions should reflect the SMP.[232] The SMP is intended to be updated on a regular basis and reviewed every five years to ensure that it continues to reflect the current state of the Kawerau system and best practice for its management.[233] The SMP will also be reviewed under certain circumstances: if the council grants new resource consents on the system; on review of any relevant regional policy; or if the provisions of the SMP are determined by the council in consultation with consent holders to be out of date and/or no longer fit for purpose.[234] The process to review the

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[227] For example, an SMP could form an operational protocol; see Penny Doorman and Jim McLeod "The Changing Face of Geothermal System Management Plans in New Zealand" (from proceedings New Zealand Geothermal Workshop, November 2018) at [Abstract] and [2.1].

[228] Holly Doremus "Data Gaps in Natural Resource Management: Sniffing for Leaks along the Information Pipeline" (2008) 83 Ind. L J 408.

[229] *Kawerau System Management* (2018) at executive summary (i) and at [1.5]. See also Doorman and McLeod (2018), above n 226, at [2.2].

[230] At [2.2].

[231] *Kawerau System Management* (2018) at [2.8].

[232] Doorman and McLeod (2018), above n 227, at [2.2]. See also *Kawerau System Management* (2018) at [7.16].

[233] *Kawerau System Management* (2018) at [7.15.1]

[234] Consent holders may also make recommendations to the Regional Council on alternations and/or additions to the SMP as part of their annual reporting, see *Kawerau System Management* (2018) at [7.15.1].

SMP is to be "similar to the process associated with its initial preparation", a process led and managed by the Council in collaboration with the consent holders.[235]

While the SMP is a "non-statutory document"[236], it contains "agreed principles and processes" to achieve resource consent management consistency.[237] Among other things, these include: principles to guide council discretionary decision making; processes for consultation/engagement between consent holders; annual reporting processes/whole system reporting; guidelines for commercially sensitive information; and processes to provide for kaitiakitanga.[238] A system management objective is that the integrated management of the SMP is achieved by the implementation of mechanisms, operations and processes that ensure cooperation between all consent holders.[239]

A consequence of multiple consent holders' extracting geothermal energy and fluid from the same geothermal system is that there is competition for use of the resource. The potential for the operations of one consent holder to adversely affect those of another can affect operational efficiency. For example, this situation can arise due to commercial sensitivity issues around consent holder research, data and monitoring (including technical modelling) and different and competing interests.[240] However, the consent holders operate their business subject to private agreements, including agreements for supply of fluid/energy[241], sharing of data and monitoring and access to technical modelling.[242]

At Kawerau, a private agreement for information and data-sharing between consent holders exists for resource monitoring, with consent holders collectively retaining access to a calibrated and validated (peer reviewed) single, geothermal numerical reservoir model and 3D subsidence model for the geothermal system. While these are the "authoritative" models for the Kawerau

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[235] At [7.15.1].

[236] At executive summary (i) and [1.18(d)].

[237] Doorman and McLeod (2018), above n 227, at [2.2].

[238] At [2.2].

[239] *Kawerau System Management* (2018) at [6.3].

[240] At [5.2].

[241] In 2010 the Bay of Plenty Regional Council approved an application by Mercury NZ Ltd (Mercury) and Ngati Tuwharetoa Geothermal Assets (NTGA) to unitise their resource consents for "fluid flexibility". This authorised Mercury to use consented geothermal fluid when not in direct use by NTGA with reciprocal rights; see *Kawerau System Management* (2018) at [3.6] and [4.3].

[242] At [7.7], see also at [7.1.2]. Note *Waikato Regional Plan* (2007) at [7.4] policy 5 states that there is a strong preference for formal agreement(s) between (geothermal) consent holders.

system that are used in decision-making, other models may be used to develop and test ideas for management of the system, with proven ideas incorporated into the authoritative models over time.[243] The Kawerau SMP explains: [244]

> [A]uthoritative models are maintained to accurately reflect monitoring information and other new information from the geothermal system. The authoritative models are owned by [the largest consent holder at Kawerau,] Mercury Ltd, and are operated and maintained by Mercury using data from all consent holders subject to appropriate management and protection of commercially sensitive information. Under consent conditions, Mercury is required to make the accepted Kawerau reservoir model available to any third party who has a resource consent to exploit the Kawerau system. To avoid potential trade competition effects for those with an existing commercial interest in the Kawerau geothermal system, access to the model is reliant on becoming a party to a management agreement, which includes private, commercial terms and internal processes for the supply of data and modelling information. Bay of Plenty Regional Council is not a party to these commercial arrangements but has an interest in seeing the acceptance of a single reservoir model, this being a key principle of [the Kawerau System Management Plan]. In the unlikely event that commercial agreement to access the model cannot be reached, the specific reasons for this will be documented clearly to [Bay of Plenty Regional Council], including the process that will be followed by users to resolve the issue within reasonable timeframes (which may include mediation).

Therefore, information and data required under resource consents is provided to Mercury Ltd as per commercial agreements.[245] In allowing for these private agreements, the Bay of Plenty Regional Council/Kawerau SMP attempts to avoid "the potential for running duplicate, inconsistent or conflicting processes", in monitoring, modelling and reporting for example.[246] Individual consent holders claim commercial sensitivity protection for all information and data generated under their resource consent conditions held by the Bay of Plenty Regional Council; the Council is not party to consent-holder private agreements.

This can be contrasted with private agreements in petroleum resource development and regulator access to information under petroleum permits discussed in chapter seven.

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[243] *Kawerau System Management* (2018) at [7.2.4].

[244] At [7.2.4]. Any confidentiality issues relating to competition among resource consent holders on the Kawerau geothermal system are managed by Mercury through internal process ("Chinese walls") and private contractual arrangements. From personal communication with Penny Doorman, Bay of Plenty Regional Council (May 2018).

[245] *Kawerau System Management* (2018) at [7.2.4].

[246] At [5.2].

C Public Access to Resource Information?

Managing resource consent-holder information and data is challenging for the Regional Council as regards both the information for individual resource consent holders (who all claim all resource consent information is commercially and/or culturally sensitive), the information which goes between consent holders on the system and when providing the wider public with information and data about the commercial use of the Kawerau geothermal field. As shown, the Bay of Plenty Policy and Plan protect commercially sensitive information about the use and development of geothermal resources.[247] It was envisaged that the Kawerau SMP would enable the council to more easily make information available to the public regarding consent-holder resource use and to that end annual community reports on the sustainable management of the system are made publicly available.[248] However, peer review panel reports to the council regarding the SMP and consent-holder reporting are "not generally" made publicly available.[249]

It appears Bay of Plenty regional policy and practice in handling consent-holder information has tended to take its lead from the commercial stance of resource consent holders. Although commercial sensitivity concerns among competitive resource extractors appear to rest primarily on the fact multiple operators extract from the same geothermal system, consent holders have a number of private operational agreements with each other, including for the sharing of information and data and the combined use of the authoritative model.

The Bay of Plenty's blanket protection of consent-holder-generated information and data on the Kawerau geothermal system may unnecessarily restrict public's a potential competitor's and the wider research community's access to environmental information. Under RMA s 35(3), information about "the monitoring of resource consents" must be made publicly available so that the public is: "better informed of their [own] duties" in relation to environmental and natural resource management; better informed about the "functions, powers, and duties of the local authority; and [better able] to participate effectively under the Act".[250] However, a consent holder may claim commercial (or cultural) sensitivity of information generated under

[247] *Regional Natural Resources Plan* (2008) at [7.1.4] see [GR M7] regulatory method [246].

[248] See Bay of Plenty Regional Council *Kawerau Geothermal System Annual Community Reports (2016 – 2018)*. Note these reports are to the *local* community rather than for the wider region or to the public of New Zealand.

[249] *Kawerau System Management Plan* (2018) at [7.13.6].

[250] RMA 1991 s 35(3)(a) and (b).

a resource consent or resource consent application.[251] While such claims are not in themselves necessarily problematic, the interpretation of official information law by regional authorities may be.[252]

Apart from the narrow application of RMA s 42 "protection of cultural or commercial information",[253] the RMA has a presumption in favour of public hearings and public access to environmental information. Beyond the RMA, legal scholars consider that the availability of environmental information to the public can be both a constitutional right and a matter of environmental justice.[254] However, amendments to the Act have limited public participation. Since its enactment, the combined impact of legislative amendments has placed significant restrictions on the possibilities for public participation in environmental decision-making because changes have been made in the interests of time, efficiency, costs, and crisis response.[255] Nonetheless, RMA s 35(3) still continues to recognise the importance and enabling of effective public participation, specifically through providing public access to information about "the administration of policy statements and plans, the monitoring of resource consents, and current issues relating to the environment".[256]

In deciding whether to release resource consent generated information to the public, a regional council must decide whether its release is in the public interest under the Local Government (Official Information and Meetings) Act 1987 s 7.[257] Joseph notes that the public interest legal

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[251] RMA 1991 s 42 protection of cultural or commercial information is provided for in the context of a *hearing or proceeding* under the Act.

[252] For example, the Bay of Plenty *Regional Natural Resources Plan* (2008) at [GR M7] method [246] only cites RMA 1991 s 42 in relation to protection of commercially sensitive resource consent holder information rather than the wider application of the Local Government Official Information and Meetings Act 1987.

[253] Note that although protection only relates to *proceedings* under the Act, the protection of RMA s 42(3)(a) may nonetheless apply for an indefinite period.

[254] See for example Trevor Daya-Winterbottom "The Role of Administrative Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (2nd ed, Thomson Reuters, 2018) at [6.2] – [6.5]. Internationally, see United Nations Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) 2161 UNTS 447, 38 ILM 517 (1999); and Marc Pallemaerts *The Aarhus Convention at Ten: Interactions and Tensions between Conventional International Law and EU Environmental Law* (Europa Law Publishing, Groningen, 2011); and Juliana Zuluaga Madrid "Access to Environmental Information from Private Entities: A Rights-Based Approach" (2017) 26 RECIEL (1) 38-53.

[255] Resource Management (Simplifying and Streamlining) Amendment Act 2009; Resource Management Amendment Act 2013, and Resource Legislation Amendment Act 2017. See further Prue Taylor "The Relevance of International Environmental Law for Domestic Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (2nd ed, Thomson Reuters, 2018).

[256] RMA 1991 s 35(3)(a) and (b).

[257] Local Government Official Information and Meetings Act 1987 (LGOIMA) s 7(1), (2)(b)(ii), and (2)(ba). Note the Official Information Act 1982 (OIA), LGOIMA and the Privacy Act 1993 (which relates to individuals'

test is not well understood by some agencies that process information requests and the test can be difficult to apply in practice.[258] Official information case law and Ombudsman decisions and guidance notes help explain parties' uncertainty and variance in applying official information law.[259]

The early, leading Ombudsman case on public interest evaluation concerned geothermal energy development and disclosure of commercially valuable resource information.[260] The Ministry of Energy (the resource developer at the time) argued vigorously that the public interest was commensurate with taxpayer interests which would be promoted by the Crown's gaining maximum return from the Rotokawa geothermal field which it claimed to own by virtue of the Geothermal Energy Act 1953. It was argued that information disclosure about the extent of the resource would increase the chances of a private sector company obtaining a water right to the steam and thus would be contrary to the public interest. The Ombudsman rejected this equivalence and found a relevant public interest in promoting effective policy on the development of the energy resource:[261]

> There must also be an interest […] in members of the public being able to participate in the decision making process concerning the use of the resource *with regard being had to values wider than the commercial values* of [the Ministry of Energy's trading arm, Gas and Geothermal Trading Group (GGTG)]. In my view it was not for the GGTG, as an

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officially held information) make up New Zealand's official information law. The OIA and the LGOIMA's principles and operation are largely identical and both Acts are complementary components of the same statutory scheme; see Paul Roth and Graham Taylor *Access to Information* (2nd ed, LexisNexis, 2017) at 1.

[258] Philip Joseph *Constitutional and Administrative Law in New Zealand* (4th ed, Brookers Ltd, 2014) at 274. See also New Zealand Law Commission *The Public's Right to Know: Review of the Official Information Legislation* (June 2012). This report identified a need to improve guidance for persons (both requesters and public agencies administering requests) using official information legislation, and recommended structural legislative change to make the official information regime more coherent and accessible. See further Mai Chen *Public Law Toolbox: Solving Problems with Government* (2nd ed, LexisNexis, 2014) at 437.

[259] See for example Office of the Ombudsman *Public Interest: A Guide to the Public Interest Test in section 9(1) of the OIA and section 7(1) of the LGOIMA* (Guide: Public Interest, May 2016). See geothermal resource and mining decisions, *Geotherm Energy Ltd v Waikato Regional Council* PT Auckland A22/90 (9 May 1990) (see particularly, at 12-13); and *Kiwis Against Seabed Mining Inc. v Environment Protection Authority, Trans-Tasman Resources Ltd & Talley's Group Ltd, Te Rununga o Ngati Ruanui* (*KASM*) [2016] NZEnvC 217 at [15], [54] – [58], and [60] – [68]. Although *KASM* concerned an application under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act) and not the RMA, EEZ Act ss 17(1)(b) and 158 (protection of sensitive information and the reasons for withholding information, and public participation) mirror those of RMA 1991 ss 35 and 42. For a discussion of more general official information case law, see Roth and Taylor (2017), above n 257.

[260] Ombudsman Case Nos 879 and 907 (1986—87) 8 CCNZ 73. See also Ombudsman Case Nos 787 and 1127 (1987) 9 CCNO 114, concerning commercial prejudice and disclosure of scientific reports regarding gas reserves; and Ombudsman Case No 965 (1988) 9 CCNO 119, concerning the pubic release of tender prices.

[261] Ombudsman Case Nos 879 and 907 (1986—87) 8 CCNZ 73 at 75. Emphasis added.

> organ of the Ministry established expressly for commercial purposes, to decide for itself whether the public interest equated with its commercial interests in this case.

Because water rights were also at issue, the Ombudsman also found a public interest in the purposes of the Water and Soil Conservation Act 1967 and the need for the relevant water authority to be fully informed.[262] Importantly, the resource information had also been built up over a period of years as a result of work carried out by a number of government departments and paid for by public funds. As well as noting the public interest, the Ombudsman noted and linked another public authority to information availability, thereby incorporating wider values. The decision has lasting application. Despite the Ombudsman's recommendation however, the Ministry of Energy overrode the Ombudsman's order.[263] Commentators have remarked that this decision and the action taken by the Minister of Energy markedly changed future attitudes towards information release of geothermal data and reports by energy developers.[264] It is perhaps striking to note that 25 years on that there are no constitutional-level safeguards should the government decide to push short-sighted or otherwise unsustainable resource use.[265]

As the geothermal *Efficacy Review* (above) identified, regulators can rely on consent holders to go the extra mile in the supply of information not legally required under a resource consent. Although doing so helps the regulator (and the peer review panel) gain a broader understanding of resource consenting monitoring issues, such regulatory settings are less than ideal, especially when coupled with a lack of transparency in regional policy in describing geothermal resource "renewability" and when an overall, broad judgment approach is routinely taken to geothermal development decision-making. While the above considerations may figure in decisions about whether to release officially held information to the public, they are also factors which law and

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[262] Thesis chapter three notes that WSCA information provisions were imported into RMA 1991 s 35.

[263] Ombudsman Case Nos 879 and 907 (1986—87) 8 CCNZ 73 at 76. For insightful discussion of this decision and similar issues see Raybon Kan *Confidentiality and Abuse of Discretion: Legal Aspects of the Information Flow Between Government and Private Sector in New Zealand's Petroleum Industry* (prepared for the Energy and Natural Resources Law Association of New Zealand Inc, 1989) at 11-13 and 51. Note Ministerial power of veto was repealed by the Official Information Amendment Act 1987 s 18 (1987 No 8); see Official Information Act 1982 ss 32, and 32A – 32C.

[264] White and Chambefort (2016), above n 54, at [4.6].

[265] New Zealand's lack of a formal, written constitution means there is no constitution-level environmental or natural resource protection in New Zealand; see further Geoffrey Palmer and Andrew Butler *A Constitution for Aotearoa* (Victoria University Press, 2016). Note greater oversight roles are proposed for central government agencies (the Ministry for the Environment, the Department of Conservation, the Environmental Protection Authority, and the parliamentary Commissioner for the Environment) in Ministry for the Environment *New Directions for Resource Management in New Zealand: Report of the Resource Management Review Panel* (June 2020) at 436-438.

policy itself can clarify so that these factors need not act as keepers of a status quo in persuading decision-makers in favour of commercial rather than wider public interests.

Hypothetical questions remain: How might the protection of consent-holder commercial sensitivity claims on the Kawerau geothermal system thwart the public interest or trade competition? Does scarcity of information and data available to the public and wider research community preclude scientifically and technically valuable experimentation for optimal resource management? What role can the public play in natural resource decision-making, especially concerning a publicly owned resource when information about the resources is restricted? Should private exploiters of public resources pay royalty charges?[266]

V Technical Modelling for Geothermal Resources

To better understand the scope and limitations of geothermal peer review, it is helpful to orient technical peer review within New Zealand's resource management regime more broadly and to have an understanding of the role of peer review internationally. It is also relevant to understand the application of technical modelling used in geothermal resource management and how peer review functions apply to technical modelling. This understanding helps answer the question how can resource consent conditions be enforced if peer review panels cannot verify or audit information and data generated under resource consents? It also adds strength to arguments for legal standards formalising peer review processes in environmental and natural resource management in New Zealand.

Mathematical modelling has become an indispensable discipline in environmental sciences for example for describing and exploring complex ecosystem behaviour, substituting or complementing experimental studies and testing or developing hypotheses.[267] Environmental decision-making frequently relies on predictive mathematical modelling as an evidence base. Modelling is used extensively in New Zealand and internationally to manage large-scale exploitation of geothermal resources and it plays a vital role in decision-making for geothermal resource management. There are three main types of models in geothermal resource management: conceptual, numerical reservoir and subsidence models. Generally, developing

[266] See Sam Malafeh and Basil Sharp "Role of Royalties in Sustainable Geothermal Energy Development" (2015) 85 Energy Policy 235-242. Although the RMA 1991 s 360(1)(c)(iv) provides for royalty charges for geothermal resource use, industrial exploiters of the resource have never been charged royalty fees by regional or central government.

[267] Deniz Özkundakci and others "Building a Reliable Evidence Base: Legal Challenges in Environmental Decision-Making call for a More Rigorous Adoption of Best Practices in Environmental Modelling" (2018) 88 Environmental Science and Policy 52 at 52.

and maintaining a model is expensive. A consent-holder company for example is therefore unlikely to make its model freely available. Models are also improved by testing them against observational data. This is also an expensive process. Consequently, who improves a model and how information and data are shared so that tests can be made involves questions about the free flow of information.

A conceptual model is used for geothermal resource planning, exploration, well-siting, development and utilisation. It is also used to form the basis for numerical reservoir modelling and resource assessment. Conceptual models hypothesise the geothermal heat source; controls on the flow of fluid and heat within the system; location of recharge zones, the main fluid flow paths within the reservoir, including outflows and resource boundaries; and the reservoir temperature distribution and physico-chemical processes such as boiling and steam separation. Conceptual models combine insights from various disciplines and are often presented visually through surface maps, subsurface "slices", cross-sections and 3D visualisation.[268] Numerical modelling provides input into the development and revision of conceptual models and vice versa.

In New Zealand, numerical models have been developed and are generally seen as the cornerstone for geothermal reservoir modelling and predicting both optimal resource extraction locations and the effects of extractions.[269] Numerical models are commonly used for resource assessment to predict changes in geothermal system pressure, temperature and state (liquid and vapour); to predict changes in fluid chemistry; and to assess the impact on surface features, surface levels (subsidence), groundwater and well productivity.[270] Numerical model verification is carried out by comparing theoretical predictions with available data. Reservoir performance is assessed and evaluated through periodic comparison of predictions with measured changes in the reservoir parameters. A significant difference in predictions and measurements would indicate the need for a conceptual model review, an adaptive management response or changes to consented activities.[271] Subsidence models are used to predict the effects of extraction and reinjection of geothermal fluid on land subsidence relative to natural subsidence due to subduction processes. As with reservoir modelling, a significant difference

[268] *Kawerau System Management Plan* (2018) at [7.2.1].

[269] John Burnell and others (2016), above n 97, at [3.1].

[270] At [3.2].

[271] *Kawerau System Management Plan* (2018) at [7.2.2].

between observed and predicted subsidence levels would signal the need for model review or an adaptive management response.[272]

Assumptions in environmental modelling are virtually unavoidable.[273] Geothermal resources are complex physical systems and even the best models involve considerable simplification of the system complexity. Nevertheless, models can reflect many of the changes observed through scientific monitoring of the reservoir. Technical modelling provides a degree of confidence that appropriately built models can be used to assess the reservoir effects of geothermal developments and used to predict what might happen with different configurations of fluid take, use and discharge. However, predictions from numerical models must be used with caution.[274] To have confidence in predictions from a model, it is important that the model is developed appropriately on the basis of the available information and questions to be addressed, that it incorporates all the pieces of information on the geothermal system and that uncertainties in its predictions are understood.[275] Accordingly, the input of up-to-date and accurately recorded data and information from the consent holder is crucial to model viability.

Currently, there is no universal approach to assessing a model's predictive uncertainty. Estimating model predictive uncertainty currently relies on the experience of the modeller as there is no systematic approach for understanding and quantifying the predictive uncertainty. Various approaches are taken to assess predictive uncertainty, including using process models to assess differences in predictions across ranges of key parameters, using inverse modelling software to perform the uncertainty analysis and ad hoc testing designed by the modeller. Ad hoc testing is the most common approach.[276] All approaches are highly reliant on the experience and capability of modellers (ie what the modellers have been instructed to do) and on the experience and capability of reviewers.[277] There is no such thing as a true or correct

[272] At [7.2.3].

[273] Özkundakci and others (2018), above at 267, at 59.

[274] Burnell and others (2016), above n 97, at [3.3]. See also for example in *Contact Energy Ltd*, above n 167, at [210].

[275] At [3.3].

[276] At [3.3].

[277] From personal communication with Prof. Mike O'Sullivan, University of Auckland (April 2016). O'Sullivan considers: "Probabilistic modelling is always to be preferred over one-shot deterministic modelling but in the geothermal context it is very difficult. To do probabilistic modelling you have to randomly sample from distributions of model parameters, check the calibration of the model, or re-calibrate it, and then run a future scenario. Then repeat the process 1,000 to 10,000 times. Geothermal models run slowly and they take a long time to calibrate. We are working hard on making this process work but we are not there yet." See further in Jericho Omagbon, John O'Sullivan, Mike O'Sullivan and Cameron Walker "Predictive Uncertainty Estimates in

model of a geothermal field. Geothermal resources are very complex systems. Hence, while a model can be calibrated to known data, the modelling process remains somewhat subjective and it does not produce a unique outcome.[278]

Modelling is also an interdisciplinary exercise. For example, a geothermal engineer peer review panellist (working according to the professional standards of the Institute of Professional Engineers New Zealand) may work to a different professional standard to the geothermal scientist or chemist.[279] Do such differences affect the overall quality of the PRP's work and, if so, how are such differences managed? Peer review panels are also reviewing an area of greater complexity and fluidity than is usually encountered by an engineer. Does the geothermal profession in New Zealand (including consent holders, peer reviewers and the wider research community) develop geothermal models using best practice modelling standards? If domain-specific standards exist within the geothermal community, do they also take into account the qualifications and professional standards of those using and reviewing models? Although general best practice standards for modelling are used internationally, New Zealand modellers (generally) do not always follow such guidelines.[280] Should best practice standards and professional association standards be a formalised requirement (nationally or regionally) for geothermal modelling and peer review panellists?[281]

There has been little systematic analysis of the legal challenges which may be presented as a consequence of modelling predictions used in natural resource decision-making.[282] Where predictive models form part of the evidence base for decisions, the evidence may be challenged by opposing parties.[283] A survey of New Zealand environmental case law found that the

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Geothermal Reservoir Modelling Using Linear Analysis" (from proceedings New Zealand Geothermal Workshop, November 2015).

[278] See *Geotherm*, above n 2, at [171].

[279] Note with geothermal resource consent management an area of greater complexity and fluidity is being reviewed than is usually encounter by an engineer. An indication of this is the major evidence provided as part of the resource applicant's assessment of environmental effects is recognised as from a science rather than an engineering domain. From personal communication with Waikato Regional Council staff member (August 2017).

[280] Özkundakci and others (2018), above n 267, at 52.

[281] Hilke Giles and Barry Barton "Adaptive Management under the RMA: the Tension between Finality and Flexibility" (2020) 24 NZJEL 1. The authors raise the matter of professional certification of modelling choices and the development of best-practice guidelines at 23-26 and 33. See also Mike Freeman "The resource consent process: Environmental models and uncertainty" (2011) 2 RMJ 1 at 5-6 regarding independent certification procedures for environmental modelling choices.

[282] Özkundakci and others (2018), above n 267; and Giles and Barton (2020), above n 281.

[283] Three geothermal resource management decisions where models where challenged were *Rotokawa JV*, above n 159, (resource consent appeal, geothermal extraction/reinjection issues with model input data and assumptions); *Geotherm*, above n 2, (regarding the *Waikato Regional Plan* appeal, geothermal extraction/injection and issues

majority of challenges relating to models challenged the substantive, scientific components and usually in connection with assumptions, input data and applied modelling parameters. The next most common form of challenge concerned the model evaluation process, often with issues related to model validation and/or peer review. Although three court cases regarding the use of geothermal models were challenged regarding issues with model input data and assumptions and model complexity, no geothermal cases have raised legal challenges with peer review processes or information/data verification per se. The Environment Court reiterated a Planning Tribunal decision regarding the value of mathematical modelling for geothermal resource management:[284]

> We consider that their true value has been as tools used by persons qualified to interpret them to inform their own opinions about the probable effects of the proposed taking.

This statement followed "a lot of evidence", where the Court had found experts' critical comparisons "of little assistance where our focus was to assess the evidence for the purpose of determining appropriate objectives and policies."[285]

Typical verification of results by a peer reviewer does not sit easily with the nature of geothermal peer review work because resource monitoring, data aggregation and resource modelling carried out by the consent holder is deemed too costly and inefficient to be replicated or duplicated by others. Although the Waikato Policy refers to the panel's role as an "auditor" of resource consents and system management plans, panels do not perform an audit in the traditionally understood sense; that is, there is no examination of real-time data or resource monitoring.[286]

The regulator and PRP therefore rely on trust in the accuracy of consent-holder monitoring data and reporting. In a hypothetical worst-case-scenario, if peer reviewers are largely approving (box-ticking) the activities of consent holders exploiting geothermal resources, if the public is not aware of geothermal resource management issues, and if the wider research community is excluded from accessing information and data upon which models (and decisions) are based, there is no ability (or apparent cause) to challenge the work of peer reviewers or to question

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with model complexity and certainty); and *Contact Energy Ltd*, above n 167, (a resource consent appeal, issues with input data and model assumptions).

[284] *Rotokawa JV*, above n 159, at [209].

[285] At [209].

[286] For example, mainstream understandings of auditing usually relate to financial auditing which involves investigation to the extent that auditors gain access to original documents and records.

model validation/verification. Under existing policy and rules, could this scenario occur? Is the current policy and management approach by regional authorities the best one to ensure the long-term sustainable management of geothermal resource taonga in New Zealand?

Jones and others reviewed best practice for environmental modelling in regional government resource management in New Zealand, noting:[287]

> the fact that best practice guidance is not always implemented in the development and application of models for environmental management suggests there is still a need for implementation strategies that account for practical obstacles.

Further, drawing on their research and experience, they postulate a "two-sided gap of understanding between those tasked with making environmental decisions" (eg environmental managers, policy makers, decision-makers and their advisors, and stakeholder end-users) and modellers charged with generating and interpreting model outputs for environmental decision-making processes. They argue that best practice guidance is "often written from the perspective of the modeller with a strong technical focus, and with limited involvement of those ultimately making decisions based on model predictions". Consequently, those end-users may either be unaware of available best practice or may not understand the risks of not requiring modellers to follow best practice.[288] While these insights may have less application for geothermal modelling under resource consents where peer reviewers are more likely to be aware of best practice standards for geothermal modelling, the "two-sided gap of understanding" is still a factor. For example, a regional council geothermal resource consent manager may be unaware of best practice or the risks of best practice not being followed, or where region- or national-wide planning for geothermal resources may occur.

The Parliamentary Commissioner for the Environment (PCE) 2018 report[289] on and subsequent request for an independent Science Advisory Panel review[290] of the Overseer model showed that the model which had long been a central pillar of regional councils' freshwater

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[287] Hannah FE Jones and others "Bridging the Gap: A Strategic Framework for Implementing Best Practice Guidelines in Environmental Modelling" (2020) 114 Environmental Science and Policy 533-541 at 534.

[288] At 534.

[289] Parliamentary Commissioner for the Environment *Overseer and Regulatory Oversight: Models, Uncertainty and Cleaning Up our Waterways* (December 2018).

[290] Ministry for Primary Industries *Overseer Whole-model Review: Assessment of the Model Approach* (technical paper 2021/12 prepared for the Ministry for Primary Industries and the Ministry for the Environment by the Science Advisory Panel, July 2021).

management was in fact not fit for regulatory purposes.[291] The Overseer model was originally developed as a tool to help farmers use fertilisers and other inputs efficiently and to estimate nutrient loss from farms. Over time, the model came to be used nationally by regional councils to help inform regulations around water quality. However, the model had never been subjected to rigorous peer review and evaluation, and its use in determining resource consent compliance was rarely audited.[292] In its independent report, the Science Advisory Panel said that the panel:[293]

> does not have confidence that Overseer's modelled outputs tell us whether changes in farm management reduce or increase the losses of nutrients, or what the magnitude or error of these losses might be. [And that the model is] unlikely to be a reliable tool for predicting either relative or absolute nutrient loss estimates.

The PCE commented that the findings of the Science Advisory Panel were "devastating" and proposed actions are underway to address this major environmental management failure.[294] Ownership (intellectual property in) of the Overseer model is split between the Ministry for Primary Industries, AgResearch (a government-owned research institute) and the New Zealand Phosphate Company Ltd (which is owned in equal shares by New Zealand's two major manufacturers of superphosphate and nitrogen fertilisers: Ballance Agri-Nutrients Ltd and Ravensdown). The PCE believes the government should consider compensating the fertiliser companies for their investment in the Overseer model in order to become its sole owner.[295] Doing so would provide total transparency about the model and any future uses to which it might be put.[296]

The Overseer model's failure as a regulatory tool for nationwide water quality management and the failure (over decades) of regional councils to have the model independently peer reviewed make for a sobering lesson in natural resource management where regulatory methods are reliant on technical modelling. However, no explicit requirements either under the

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[291] Parliamentary Commissioner for the Environment (2018), above n 289, chapter 4. See also Parliamentary Commissioner for the Environment (media release) "Findings of Overseer Water Quality Model Review 'Devastating'" (11 August 2021).

[292] PCE media release (2021), above n 291.

[293] PCE media release (2021).

[294] PCE media release (2021).

[295] Regarding social licence and resource development broadly see Kevin Jenkins "Can I See Your Social Licence Please?" (2018) 14 Pol Quart 4, 27-35.

[296] Parliamentary Commissioner for the Environment "Read the Q+A about What the Commissioner thinks about the Review Findings and Government Response" at <www.pce.parliament.nz/media/197124/faqs-overseer-independent-review-pdf-146-kb.pdf>.

RMA (or elsewhere) made it compulsory for regional councils to have the Overseer model independently peer reviewed or for its use in resource consent compliance to be scrutinised.

A International Peer Review

Internationally, it is acknowledged that peer review is an important though limited mechanism for quality control within the scientific community.[297] While it has many manifestations, peer review generally involves a review of materials by experts who are thought to have adequate knowledge and technical expertise to judge the material's quality, while being sufficiently impartial and disinterested to provide judgement free of conflict of interest.[298]

Peer review plays an important role in the production and shaping of the scientific knowledge that is the product of the scientific enterprise. Scientists are constantly evaluating and building on each other's work through a continual system of experimentation, publication, dissemination, replication and further experimentation.[299] Generally, peer review may be performed either in the decision-making process of agencies and institutions that provide financial support for scientific research or in the editorial prepublication assessment of manuscripts submitted to scientific journals—perhaps the best-known type of scientific peer review. Peer review is generally described as a scientifically rigorous review and critique of a study's methods, results and findings that is conducted by others in the relevant field who have the requisite training and experience, have no pecuniary or other disqualifying bias with respect to the topic and are independent of the persons who performed the study.[300]

Regarding the fundamental principles of objectivity, independence and transparency for good regulatory science, science and legal experts in the United States agree:[301]

> The data and methods of research that informs regulatory decisions must be communicated honestly and expeditiously to the research community and broader public. […] Regulatory agencies should rigorously review and challenge exaggerated claims […] [and] that underlying data must be kept confidential for business and other reasons.

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[297] David Michaels "Politicizing Peer Review: The Scientific Perspective" in Wendy Wagner and Rena Steinzor (eds) *Rescuing Science from Politics: Regulation and the Distortion of Scientific Research* (Cambridge University Press, 2006) at 219.

[298] At 219.

[299] At 219.

[300] JB Ruhl "Prescribing the Right Dose of Peer Review for the Endangered Species Act" (2004) 83 Nebraska Law Review 398 at 402.

[301] Wagner and Steinzor (eds) (2006), above n 297, at 9 and 10.

Openness in science allows scientists not only to replicate and thereby validate their colleagues' work, but also to build on prior research and make new discoveries.[302] The democracy of science demands a transparency of methods and data.[303] In science there is no "unquestionable authority": no one in science can claim infallibility. This approach is reflected historically in the establishment and purpose of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and more recently in the development of international climate science via the Intergovernmental Panel on Climate Change (IPCC).[304]

Trust plays an essential role in the healthy functioning of science.[305] Among working scientists this trustworthiness is part of the moral order of each research community. The complex interplay of originality and scepticism that operates in such groups requires absolute impersonal trust on matters of empirical "fact". Any confounding interests that can compromise the penultimate goal of getting at the truth will begin to diminish the integrity of and public confidence in the scientific enterprise. Withholding of information violates the communitarian norm of science and also limits the possibilities of self-correction. The health and integrity of science must be protected from its capture by private interests.[306]

While the history of the politicisation of science informing policy in the United States differs markedly from New Zealand's experience, the above approach can yet be usefully applied in New Zealand, particularly under the RMA where the larger share of resource management is left to regional authorities with (historically) little oversight from central government agencies. The use of peer review is a regulatory and decision-making tool which decision-makers use to source independent, technical information needed for resource management decision-making. As with adaptive management, peer review is not a requirement of the RMA; rather, it has developed from the Act's devolved decision-making rubric. A significant body of case law discussing peer review and adaptive management jointly in decisions concerning policy development and approval (or not) of resource consent applications gives clear direction regarding the role of science and the quality of science on which decision-makers and the public

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[302] At 15.

[303] At 63.

[304] See further Alexander Gillespie "Reliable Scientific Foundations: International Best Practice and the New Zealand Experience" (2017) 21 NZJEL 1 at 3-5.

[305] Wagner and Steinzor (eds) (2006), above n 297, at 66.

[306] At 85. See also Paul Edwards and Stephen Schneider "Self-Governance and Peer Review in Science-for-Policy: The Case of the IPCC Second Assessment Report" in Clark Miller and Paul Edwards (eds) *Changing the Atmosphere: Expert Knowledge and Environmental Governance* (Cambridge, Massachusetts, MIT Press, 2001).

must be able to rely.[307] However, case law has not accumulated peer review standards; rather, peer review in managing resource consents is viewed as a "necessary requirement"—the oversight of which is left to regulatory authorities whose institutional resources, knowledge and expertise vary significantly.[308]

The Overseer model's use was a worst-case-scenario in regulatory environmental management. Yet, the RMA and New Zealand's broad environmental management regime—the same regime which governs geothermal resource management—did not prevent this colossal mismanagement. Given that peer review of geothermal resource user compliance does not entail a real audit of information and data and that alternative models are not developed due to cost and commercial sensitivity claims, geothermal resource management policy and rules could require formal best practice standards for geothermal resource management modelling and peer review. These could include the independent peer review of models, rules for professional association of peer reviewers and public conflict of interest registers. In the same way that the PCE suggested that government should consider owning the Overseer model (and given geothermal resources are publicly owned) would regional council or central government ownership of geothermal resource management models be more ethically and procedurally sound than private ownership by resource consent holders? Such ownership may be particularly justified for the Kawerau geothermal system where multiple users have access to and use of the same "master" model. Public ownership of geothermal resource development/management models would also encourage the wider research community's involvement in developing best-practice geothermal resource management.[309] As with the question of royalty charges for industrial-scale geothermal resource use, Māori rights and interests in geothermal resources are relevant to such considerations.

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[307] See for example (adaptive management) *Environmental Defence Society Incorporated v The New Zealand King Salmon Company Limited* [2014] NZSC 38; (peer review) *New Zealand Pork Industry Board v Director-General of the Ministry for Primary Industries* [2013] NZSC 154, [2014] 1 NZLR 477; and (adaptive management) *Crest Energy Kaipara Limited v Northland Regional Council* [2011] NZEnvC 26.

[308] See Marie A Brown *Last Line of Defence: Compliance, Monitoring and Enforcement of New Zealand's Environmental Law* (Environmental Defence Society, Auckland, 2017); and Marie A Brown, Raewyn Peart, and Madeleine Wright *Evaluating the Environmental Outcomes of the RMA* (Environmental Defence Society, Auckland, 2016).

[309] The Resource Management Review Panel in Ministry for the Environment *New Directions for Resource Management in New Zealand* (June 2020) at 380, suggest better use of resource consenting information can be had and that it often does not inform policy and plan reviews as well as it could.

VI Iceland's Geothermal Resource Management

Iceland boasts many high-temperature geothermal resources. It has extensive geothermal resource development experience and the highest installed geothermal energy profile per capita worldwide (New Zealand comes second). New Zealand and Iceland government officials, policy developers and technical experts frequently collaborate and exchange resource management ideas and practices. A comparative review of Iceland's information and resource-monitoring law therefore provides useful context for New Zealand's legal information and resource-monitoring arrangements. Unlike New Zealand, Iceland has developed little regulation for geothermal resource management and peer review of individual geothermal developments does not appear to be a legal requirement. However, geothermal resources are managed under a wider array of statutes than in New Zealand and by a central government agency, the National Energy Authority (NEA).

Geothermal energy is fundamental to Iceland's economy and national independence. Nowhere else worldwide does geothermal energy play a greater role in providing a nation's energy supply.[310] Iceland's electricity is 100 per cent renewable energy generated and comes primarily from hydro and geothermal sources. Geothermal resource development is competitive with hydro and is not subsidised.[311] Geothermal resource provides heat to around 90 per cent of Icelandic homes. Iceland's successful management of its geothermal resources is closely linked to legal information provisions and the scope of the administrative authority to monitor resource use. Due to its high reliance on geothermal resources and geothermal resources and landscapes being prized nationally for conservation reasons, long-term planning for and monitoring of geothermal resources receives considerably more public and resource management attention in Iceland than in New Zealand.

The management challenges faced by Iceland mirror classic natural resource management challenges: the balancing of environmental and energy development interests, conflicts between different possible land uses, allocation of use rights; sustainable use and how to ensure that resources in public ownership are utilised to benefit the nation.[312] However, Iceland's legal

[310] Jonas Ketilsson and others "Legal Framework and National Policy for Geothermal Development in Iceland" (from proceedings World Geothermal Congress, Australia, April 2015) at 1.

[311] At [2.2], and [2.1] reliance on petroleum resources is at around 12 per cent divided mainly between motor vehicles and mobilisation of its ocean fishing vessels.

[312] Kristin Haraldsdóttir "Introduction to the Legal Environment in Iceland for Utilisation of Geothermal" (2010) 28 JENRL 1, 1-47 at 2.

regime for managing geothermal resources shows that legal information requirements in natural resource law reflect a widening array of considerations associated with energy needs. These include the three central considerations for renewable energy development: long-term national planning for sustainable use of renewable resources, regulation to support developing energy technology and uses and appropriate regard for international law obligations affecting natural resource decision-making.[313] The following section focuses primarily on long-term planning and information provisions and the scope of compliance monitoring. However, some background information on Iceland's current management approach is provided first.

A Geothermal Resource Policy Overview: 2000s – Present

Since the 2000s, Iceland has continued to undertake a comprehensive legal restructuring of its energy sector upstream and downstream.[314] Broadly, three events triggered this restructuring: Iceland's joining the European Economic Area in 1994; Iceland's financial collapse in 2009; and national debate concerning fundamental questions regarding resource ownership and to what use natural resources should be put, particularly after these events. After the financial collapse, government policy to substantially increase geothermal energy use in Iceland for national economic reasons exacerbated national concerns about nature conservation, resulting in further law reform and policy in an attempt to reconcile the competing agendas of energy development and nature conservation.

Iceland's electricity market was liberalised in 2003.[315] Previously, geothermal exploration and development licences were granted by Parliament without any public notification procedure on a first-in-time basis without predetermined criteria on how to choose between applicants.[316] While this approach created no substantial difficulties initially, the situation changed when energy utilities began competing for exploration licences for geothermal research as a response to the liberalised electricity market.[317] Power plants are under mixed ownership, including by the state, municipalities and private entities.[318] The largest state-owned producer of electricity (over 70 per cent of electricity) is the only power producer which sells electricity on the

[313] Ketilsson and others (2015), above n 310, at [3].

[314] Haraldsdóttir (2010), above n 312, at 3 and 25.

[315] Van Campen and Petursdottir (2016), above n 134, at [3.2]. Market liberalisation was initiated with the implementation of a European Union Directive concerning common rules for the internal market in electricity.

[316] Haraldsdóttir (2010), above n 312, at 39.

[317] At 39.

[318] Van Campen and Petursdottir (2016), above n 135, at [3.2].

wholesale market.[319] After market liberalisation, electricity production from geothermal resources effectively tripled.

1 Iceland's Master Plan

Iceland's national planning instrument for energy resources (largely hydro and geothermal)—the *Master Plan for Utilisation and Protection of Energy Resources* (the *Master Plan* or *Plan*)—is a tool to reconcile the competing interests of nature conservation and energy utilisation on a national scale and at the earliest planning stages.[320] Comparable to a strategic environmental assessment, the *Master Plan* evaluates and ranks potential energy projects on their energy capacity, economic potential, feasibility, effect on the national economy, the estimated impact each project has on the environment, cultural heritage, and society and the potential for other uses of the areas in question.[321] The *Plan* is a permanent planning tool. A new *Plan* produced cooperatively by the Ministers of the Environment and Industry[322] is submitted to Parliament at least every four years. Re-evaluation within this period recognises that increased understanding of the effects of projects and technological advancements mean assumptions can change.[323]

Under the Master Plan Act, a steering committee handles the gathering of information, the technical assessment and preparation of proposals to the minister responsible to Parliament. The *Master Plan* is based on the best available scientific information, with transparent and reproducible conclusions made available to the public.[324] The development of the *Master Plan* has provided valuable information and scientific data and to a certain extent a coherent assessment methodology for producing a comprehensive and long-term policy for energy development.[325]

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[319] At [3.2].

[320] Iceland Government Master Plan Act No. 48/2011. See the Master Plan at <www.ramma.is/english> and <www.nea.is/geothermal/master-plan/>.

[321] Ketilsson and others (2015), above n 310, at [2.3]. In 1997, the Icelandic government decided to develop a Master Plan for hydro and geothermal energy projects. Currently, the Master Plan is in its fourth phase of development, see further at <www.ramma.is/english>

[322] A new Act for the Protection and Development of Energy Resources no. 48/2011, see also <www.ramma.is/english/general-information/laws-and-regulations/>.

[323] Ketilsson and others (2015), above n 310, at [2.3].

[324] At [2.3].

[325] Haraldsdóttir (2010), above n 312, at 32 and 48. Note at 34 the author notes that the legal status of the Master Plan is yet to be determined.

Natural resources and the environment are given no special protection in Iceland's Constitution. As in New Zealand, changes to environmental and natural resource law occur through parliamentary processes.[326] The *Master Plan* provides an opportunity for public input in decision-making for geothermal resource use and protection.[327] Increased interest in geothermal resources for producing electricity and the liberalisation of the electricity market drew attention to the absence of predetermined and objective criteria in the legislation dealing with the allocation of research and utilisation licenses where there are competing applications.[328] The *Master Plan* is part of Iceland's attempt to improve this. Decisions about which resources should be developed are also made subject to environmental and planning legislation.[329]

B Geothermal Resource Management Law

Since the start of large-scale use of geothermal resources, legislation governing ownership and use of resources has attempted to ensure public control over large-scale use.[330] The Act on the Survey and Utilization of Ground Resources No. 57/1998 (GRA)—Iceland's comprehensive legislation for geothermal resources—has general provisions regarding resource ownership, development, licensing and monitoring. The GRA and Electricity Act No.56/2003 are the two main Acts governing large-scale geothermal resource development.[331]

The GRA defines "resource" as any element or energy that can be extracted from the earth, whether in solid, liquid or gaseous form regardless of the temperature at which they may be found and thus includes all forms of geothermal resources.[332] The ownership of subsoil (and therefore geothermal) resources is based on the ownership of land so that only public land resources are the property of the State of Iceland.[333] However, private ownership rights with

[326] Iceland is a democratic republic with a representative parliament. Executive power is exercised by the government and legislative power is vested in both the government and parliament. The judiciary is independent of the executive and the legislature.

[327] Master Plan Act No. 48/2011 Art 10 process and procedure [3].

[328] Haraldsdottir (2010), above n 312, at 1.

[329] For example, Public Land Act No.58/1998; National Conservation Act No.44/1999; Environmental Impact Assessment Act No.106/2000; and Strategic Environmental Impact Assessment Act No. 105/2006.

[330] Haraldsdóttir (2010), above n 311, at 12 and 24. The Act on the Survey and Utilisation of Resources (GRA 1998) No 57/1998 includes both general provisions that relate to all ground resources and special provisions for individual resources, including geothermal.

[331] Electricity Act No.56/2003.

[332] GRA 1998 art 1.

[333] GRA 1998 art 3.

respect to the disposition and use of geothermal resources are extensively limited by public law rules.[334] As in other parts of the world over the last century, public law limitations on private property rights to natural resources have developed synchronously with societal changes.[335] State expropriation of private property to promote the public interest is permitted if there is a statutory provision for it and if full compensation is paid to the expropriated party.[336] Likewise, the public interest in geothermal is also broadly protected for publicly and privately owned resources. In 2008, primarily in response to the partial privatisation of publicly owned energy companies, the GRA was amended to prohibit permanent transfer of publicly owned geothermal energy resources to private parties. Private owners were forbidden from alienating geothermal energy from the land containing it without obtaining governmental approval.[337] However, temporary (lease) rights to geothermal resources for up to 65 years are allowed.[338] Since 2008, the GRA has also provided for resource rentals "for the use of rights" which are "negotiated by the Prime Minister".[339]

Sustainable use is recognised as crucial for the long-term lifespan of the resource.[340] While the GRA does not refer explicitly to sustainable resource use, it follows from its provisions that use should take a long-term approach.[341] While various environmental Acts refer to sustainable development, none defines sustainability specifically.[342] However, the NEA has developed a sustainable use assessment similar to that developed by New Zealand.[343] The GRA allows for regulations for the enforcement of the Act; however, it appears that no such regulations have

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[334] Haraldsdóttir (2010), above n 312, at 26.

[335] Kristín Haraldsdóttir "Property Rights in Water and Social Conflict: An Example from Iceland" (2011) (Special Edition) International Journal of Rural Law and Policy – Water Law: Through the Lens of Conflict, 10.

[336] GRA 1998 arts 7 and 28 – 30; Constitution of Iceland art 72, see <www.government.is/Publications/Legislation/Lex/?newsid=89fc6038-fd28-11e7-9423-005056bc4d74>.

[337] Law Amending Some Laws on Natural Resources and Energy (2008 amendments) (No. 58/2008); GRA art 3a, 12.

[338] GRA 1998 art 3(a).

[339] GRA 1998 art 3(a).

[340] Ketilsson and others (2015), above n 310, at [5].

[341] Haraldsdóttir (2010), above n 312, at 43.

[342] For example, Nature and Conservation Act No.44/1999; Strategic Environmental Assessment Act No.105/2005; and the European Economic Agreement Act No.2/1993.

[343] See generally Jonas Ketilsson and others "Introducing the Concept of Sustainable Geothermal Utilization into Icelandic Legislation" (from proceedings World Geothermal Conference, Indonesia, April 2010); Blair Dickie and Katherine Luketina "Sustainable Management of Geothermal Resources in the Waikato Region, New Zealand" (from proceedings World Geothermal Congress, Turkey, April 2005); and Burnell and others (2016), above n 97, at [2.1] and [2.2].

been issued.[344] For the most part, the NEA relies instead on its authority during the licensing and monitoring process to make specific rules.[345]

C The National Energy Authority – Licensing and Monitoring

The administrative authority over natural resource management is divided between central government offices and respective local authorities.[346] The National Energy Authority (NEA) is responsible for energy matters, including geothermal energy and matters under the GRA.[347] The NEA carries out resource licensing (both exploration and utilisation licences), licence supervision and surveillance, research planning and data collection for geothermal resources and makes long-term estimates for energy demand.[348] The NEA has a legal obligation to provide the government with rational and efficient use of geothermal resources and must ensure that necessary research is carried out to that end by ensuring scientific knowledge is available as to both the size of the energy resource and its possible uses.[349] To achieve this end, it has been important to ensure that the NEA has access to the necessary data and monitoring information to obtain knowledge of the particular geothermal system and how that system reacts to utilisation.[350] In terms of ongoing management of geothermal, it is the knowledge of the resource and the powers granted to the NEA with respect to the collection of information, monitoring and gathering of samples that are of crucial importance.[351] For example, since 2015 (and presumably in relation to its monitoring and planning functions and the increase in reliance on geothermal resources nationally) the NEA has stipulated certain limits on

[344] GRA 1998 art 33. See also Christopher Matthews "Leigjendavandinn: The Tenant Problem in Geothermal Leasing" (Master of Science Dissertation, Reykjavik University, June 2017) at [3.2.1.3].

[345] At [3.2.1.3].

[346] GRA 1998.

[347] The National Energy Authority (Orkustofnun) works under the Ministry of Industry, Tourism, and Energy, which is responsible for matters that fall under the Ground Resources Act No. 57/1998, Electricity Act No. 56/2003 and other acts relating to energy matters. See generally <https://nea.is/> and the Act on Orkustofnun No. 87/2003.

[348] The NEA's authority was extended in 2003 to decide upon and grant geothermal research and development licences (rather than by Parliament). For more information on Iceland's resource licensing decision-making, see Haralsdottir (2010), above n 311, at 35-43.

[349] At 29; and Ketilsson and others (2015), above n 310, at [3].

[350] Haraldsdóttir (2010), above n 312, at 47.

[351] At 46.

geothermal resource drawdown (extraction rates) in geothermal systems where power plants operate.[352]

Before 2003, the NEA had both administrative and research functions. With market liberalisation however, its research functions were transferred to a separate research institute which provides services for the general market and is subject to general competition rules.[353]

1 Licensing

The Ground Resources Act (GRA) covers licensing by the NEA for geothermal exploration (research) and development. A geothermal research licence is required when research is carried out for energy development or other purposes. Electricity production requires a utilisation (use) licence under the GRA and a licence to operate a power plant under the Electricity Act. A research licence confers the exclusive right to search for the resource within a given area during the term of the licence and the right to explore the extent, quantity and potential yield of the resource.[354] Both research and use licences must comply with environmental impact assessment criteria;[355] economic considerations are also taken into account in assessing use licences.[356] The NEA also considers other resource users in the area and more than one licensee may use a given resource. However, potential future users are not considered under the GRA as under the Master Plan.[357] As in New Zealand, use licences are granted on a first-in-time basis; however unlike in New Zealand, the NEA can also advertise for applications for research and use licences in a given area.[358] A use licence specifies resource boundaries and gives provisions on quantity and rate of resource use; measures for environmental protection; and disposal of structures, site clean-up and remediation at the end of the licence term.[359] Licence

[352] Ketilsson and others (2015), above n 310, at [4.2]. In a New Zealand context, such limits on draw down (extraction) rates could be viewed as an "environmental bottom line", see *Environmental Defence Society Inc v The New Zealand King Salmon Company Ltd* [2014] NZSC 38 [17 April 2014]; and discussion of environmental bottom lines in Ministry for the Environment *New Directions for Resource Management in New Zealand* (June 2020).

[353] Iceland Geosurvey (research institute) Act No 86/2003.

[354] GRA 1998 art 5.

[355] GRA 1998 art 16; and Environmental Impact Assessment Act No 106/2000 art 6 and annex II.

[356] GRA 1998 art 17.

[357] Haraldsdóttir (2010), above n 312, at 37.

[358] GRA 1998 art 19.

[359] GRA 1988 art 18. For further see Matthews (2017), above n 344, at [4.3.1] and [4.2.3].

infringements can result in licences being withdrawn and fines being imposed. Although use licences are issued for up to 65 years, licence renewals are not guaranteed.

2 *Official Monitoring Act 1999*

In contrast to New Zealand, official monitoring of geothermal resources (and their development) features more prominently in Iceland's legislation, academic commentary and in public perception[360] because geothermal resources are relied upon for almost 100 per cent of space-heating needs and increasingly for electricity production. These both legally require the efficient and sustainable use of resources. The Act on Official Monitoring No. 27/1999 is an Act of broad application that applies to official monitoring of geothermal resources. The purpose of the Act is to promote the development of beneficial and efficient official monitoring.[361] Its objectives are to ensure that official monitoring rules promote: national welfare, safety and public health; safety of property; environmental protection; normal business practices and consumer protection; and ensure that official monitoring is conducted in the most economical way possible. In addition to local, long-term energy and natural resource planning, Iceland's international obligations affecting energy use add another layer of resource monitoring requirements.[362] For example, the NEA gathers and maintains a national energy statistics database to meet the requirements of relevant regulation which it can enforce by means of fines on companies and licence holders that are obliged to submit energy-related data.[363]

Monitoring of geothermal resources is divided between three government agencies. Their differing monitoring objectives include: protecting the environment, securing occupational safety and safety of delivery at power plants and preventing overexploitation of the resource.[364] The NEA monitors efficient and sustainable use of the resource to prevent overexploitation.[365]

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[360] Orn Jonsson, Bjarni Karlsson, and Rognvaldur Saemundsson "Taming the Elements – The Use of Geothermal Energy in Iceland" in *Geothermal Energy and Society* Adele Manzella, Agnes Allansdottir, and Anna Pellizzone (eds) (Lecture Notes in Energy, Springer, 2019) at 154-155; and Haraldsdottir (2011), above n 335, at 1-13.

[361] Ketilsson and others (2015), above n 310, at 4.

[362] At [2.1] and [3].

[363] European Community Regulation No.1099/2008 on Energy Statistics.

[364] Ketilsson and others (2015), above n 310, at 4.

[365] Detailed monitoring of geothermal utilization has been set up in Iceland with data from over 53 geothermal based heat utilities (where geothermal energy production is the main business activity) and over 100 auto-producers. The data is accumulated and analysed annually by the NEA with 19 categories of utilization in order to be able to fully disseminate information to the public in accordance with the legal role of the institution and international requirements. The NEA is one of few institutions that in the past has both accumulated, interpreted

The NEA is responsible for monitoring geothermal areas being researched or utilised under licences under the GRA and for the official monitoring under the Electricity Act.[366] Disclosure requirements of licence holders under both these Acts provide the NEA with extensive surveillance powers.

Similar to resource consent reporting under New Zealand's geothermal regulations and rules, appendices attached to utilisation licences and power plant licences stipulate what detailed information a developer should present annually to the NEA. In theory, the information required provides all the necessary information for the monitoring authority to monitor the utilisation of the resource. Licensees must provide annual (or more frequent) reports of information and data necessary for controlling and modelling how the given geothermal system responds to use long term.[367] Such information includes:[368]

- the amount of fluid extracted or reinjected into each well in the geothermal field each month;
- the temperature of the water reinjected into the geothermal reservoir each month;
- results of water level measurements in wells where the water level can be measured and are within the geothermal field;
- the pressure changes or drawdown determined in the geothermal reservoir;
- the results of measurements of the enthalpy of the fluid from every production well in the geothermal field;
- chemical analysis of the geothermal water (and steam, if appropriate);
- results from simulations of the geothermal reservoir;
- results of measurements made to monitor changes in the geothermal reservoir;
- information on drilling in the industrial area; and
- a resume of improved understanding of the physical characteristics of the geothermal reservoir based on the results of latest drilling.

Such requirements are routinely part of resource consent conditions in New Zealand. For example, the final dot point (a regularly updated resume of improved understanding) seems to fit with the regular consent-holder reports that receive peer review. Therefore, at consent/permit-holder level, the comparison with Iceland shows that New Zealand's requirements for information are similar to those of Iceland (its main geothermal counterpart) in terms of regulator expectations of operator companies. However, the fact that Iceland has

and disseminated both the official statistics and the industry statistics on geothermal data; see Ketilsson and others (2015), above n 310, at [3].

[366] At [4.2].

[367] GRA 1998 art 22.

[368] Ketilsson and others (2015), above n 310, at [4.2].

both a specific Act for monitoring and that fines may be imposed for absence of data supply arguably restricts "wriggle room" for a resource developer in fulfilling information and data reporting requirements.

At a higher level of management, the NEA's centralised role in national energy planning and attendant legal obligations to gather data and science research about geothermal resources make the NEA a heavier-weight regulator compared to the regional councils in New Zealand. Under RMA ss 32 or 35 for example, regional councils are under no legal duty to report such geothermal resource data and information to central government. Nor have the RMA's "other matters" decision-makers must have regard to in s 7 (including "the efficient use and development of natural and physical resources" and "the efficiency and end use of energy" and "the effects of climate change") (yet) been extended to information reporting rules for regional councils to central government under either the RMA or the Environmental Reporting Act 2015. Arguably, if such reporting from regional councils to central government reporting were required, resource consent information and data reporting requirements would have greater weight and the work of peer review panels would receive closer scrutiny.

The role of Iceland's *Master Plan* strengthens the NEA's surveillance authority, science research obligations and the relevance of legal rules for information and data from licence holders. The NEA maintains data and builds up knowledge about the nation's geothermal resource for long-term energy planning. Regular updating of the *Master Plan* (four-yearly, or sooner where technology and knowledge changes, including societal changes) also supports the development of technology for exploiting geothermal resources. In the New Zealand context, the Policy and Plan Change process (and their regular mandatory upgrades) under the RMA allow for iterative policy and rule development. However, there is no national-level scrutiny of regional policy and rules for geothermal resource development. Further, as New Zealand transitions to its zero-carbon future, energy planning and applications of new technologies for geothermal development are arguably a matter of national importance which should be developed and ultimately decided on by central rather than regional government. Consider for example the many risks associated with the likely future development of supercritical geothermal resources in New Zealand.

Because it is legally required to, Iceland's *Master Plan* can claim that it is based on the best available scientific information and data, with transparent and reproducible conclusions made available to the public. However, in New Zealand there is no central, regularly updated data

repository for geothermal resource data and information and no formal data standards in regional policy or rules. Overall, geothermal resource monitoring has become increasingly important in Iceland since increased use for electricity production may lead to more pressure on individual geothermal areas.[369] In comparison, New Zealand's geothermal resource management receives considerably less attention strategically. There is no resource allocation tendering and its management is overall less accountable to the public than in Iceland. While Iceland's approach appears to be due to its high reliance on geothermal resources nationally, as New Zealand's climate change adaptation measures increase and national level environmental reporting becomes more sophisticated, New Zealand can learn from Iceland's strategic approach in lending weight to legal provisions for information about resource management.

VII Key Points

The RMA intended regional authorities to develop regional policy to reflect significant resource management issues and to provide for their management, with rules giving effect to the Act. The policy and plan rules of geothermal regions in New Zealand have fulfilled this requirement to different extents; however, in practice the management of large-scale geothermal developments by regional councils (including the resource consent application process and resource consent monitoring and enforcement) is largely identical. While the physical characteristics of each region's geothermal resources may account for some regional difference in policy and rules, the biggest influence on policy and plan differences is more likely due to the physical availability of geothermal resource for development and the level of competition to develop the resource at an industrial scale. Furthermore, as identified, working definitions and terms in regional instruments are not mandaorty under the RMA; indeed, regional plans themselves are not mandatory under the Act.

The Waikato Region's overhaul of geothermal policy and rules (finalised in the last two decades) occurred with significant input from the geothermal industry and consent-holder companies and resulted in policy that requires resource users to efficiently rather than sustainably use development geothermal systems. Resource users are not explicitly required to show the adverse environmental effects of resource exploitation on development geothermal system; rather, environmental effects focus on the overlying and/or built environment. Although geothermal systems can be vulnerable to irreparable damage by exploitation and

[369] Haraldsdóttir (2010), above n 312, at 46.

although the renewability of geothermal systems occurs over decades (or hundreds of years), descriptive content about sustainability of use and timeframes of renewability are nowhere to be found within the current Waikato (or Northland) policy. Instead, the Waikato Policy focuses on the sustainable management of the regional resource as a whole. While the RMA may allow for this approach whereby some geothermal systems are protected from exploitation and others are classified for development and gradual depletion, regional policy is silent regarding the resting or rotation of development geothermal systems currently exploited under resource consents. Nor do regional plan rules require the reporting of information and data about the future state of the geothermal system being exploited at the end of the consent period. Excessive rates of geothermal resource use are routinely consented in geothermal systems categorised for industrial development in New Zealand. Additionally, some systems subject to such exploitation are now being retired because they are no longer economically efficient to operate.[370] Nevertheless, the Waikato Policy provides no information through which a layperson might understand resource depletion or its implications. Therefore, does such policy in fact provide for the reasonably foreseeable needs of future generations?

This chapter explored how regional policy and rule requirements for information (and data) should directly relate to RMA s 35 information requirements, a resource consent applicant's assessment of environmental effects and a resource consent's ongoing compliance monitoring. In support of these RMA requirements, information management processes were also explored. These included policy and rules as they function via non-statutory management tools, such as adaptive management, technical modelling, peer review and information management protocols. The chapter showed how experimentation with resource management tools in a regulatory setting may be prone to lapses in substance and process, especially where there is an absence of external oversight.

With a policy focus on efficient (rather than sustainable) use of individual geothermal systems and the inability to truly audit consent-holder compliance, the scope of the peer review panel role became unclear. Further, if adaptive management is born from the precautionary approach, how is adaptive management practice under geothermal resource consents consistent with the precautionary approach where sustainable use of geothermal systems is not required in policy? Resource consent-holder reluctance for the public or a wider research community to have

[370] Rachel Canning "Contact Energy Considering Closure of Wairakei Geothermal Power Station" *Rotorua Daily Post* (3 March 2022).

access to information and data generated under a resource consent holding adds to this compliance and transparency dilemma. Due to the nature and costs of modelling, verification and/or auditing are not currently within a regional council's ability; instead, peer review panels and councils rely on trusting that a consent holder will carry out its operations and report accurately. To counter this shortcoming, the chapter suggested that independent peer review of consent-holder models and public ownership of models used in geothermal resource development may be justified. Also justified are regular public reporting on geothermal system depletion rates, formalised (legal) best practice standards for modelling used as a regulatory tool and publicly available information about peer reviewer's professional associations and conflicts of interest.

This chapter highlighted substantive and procedural challenges associated with legal provisions for information in managing geothermal resources under the RMA. Lastly, as a comparator country that New Zealand can learn from, Iceland's geothermal resource management demonstrated the strategically important link between centralised, national-level information and data reporting, long-term energy planning and resource user reporting. The National Energy Authority's extensive surveillance powers and its legal duties to supply data and science information for the regularly updated *Master Plan* also reinforced the importance of licence holder reporting, and keeping public accountability for geothermal resource management and energy planning front and centre.

Now that this chapter has built up a detailed understanding of policy, rules and non-statutory management tools for geothermal resource management, the next chapter explores the regulatory relationship between a regional council and consent holder to identify common management pitfalls which can arise due to agency capture and/or imbalance of bargaining power between parties in the management of the geothermal resource bargain.

CHAPTER FIVE

REGULATORY THEORY IN GEOTHERMAL RESOURCE MANAGEMENT

I Introduction

Drawing on Professor Julia Black's framework for regulation analysis introduced in chapter two, this chapter assesses the regulatory functions of a regional council and peer review panel (PRP) and their working relationship with a resource consent holder for large-scale geothermal resource use. The acknowledged "collegial" style of this relationship is evaluated within a broader examination of the purpose and usefulness of Black's regulatory conversations. Regulatory theorising—led by Black—recognises that collegiality between regulated and regulator can improve regulatory outcomes in particular instances.[1] Nevertheless, this research suggests that misuse of collegiality in a regulatory context may hinder regulatory outcomes. This situation may occur where a lack of clarity exists regarding the role and authority of the regulator, especially where a regulator delegates aspects of its functions to a third party such as when a regional council delegates to a PRP. Using Black's criteria to assess the legitimacy of regulatory conversations as a regulatory tool, the chapter helps answer the research question by showing that regulatory process underlying legal information provisions—in this instance, processes influenced by regulatory relationships—can contribute significantly to the design and fulfilment of information provisions themselves.

II The "Collegial" Relationship between Regulated and Regulator

Broadly in the sciences, collaboration and disinterestedness in outcomes dominates scientific enquiry. Science is geared to maintaining collegiality between scientists so that hypotheses can

[1] Julia Black "Talking about Regulation" in Michael Harris and Martin Partington (eds) *Administrative Justice in the 21st Century* (Hart Publishing, Oxford, 1999). Professor Black, London School of Economics, Department of Law (1994—), has written extensively on regulatory issues in financial services regulation, regulatory disasters, and risk regulation within the United Kingdom, and has advised policy makers, consumer bodies and regulators on issues of institutional design and regulatory policy internationally. In 2014, she was the Sir Frank Holmes Visiting Professor in Public Policy at the University of Victoria, Wellington, New Zealand.

be vetted and new discoveries advanced.[2] Accordingly, science, engineering and other experts in the relatively small geothermal industry in New Zealand (and globally) interact in a collegial fashion. For example, annual national and international workshops and conferences are attended by industry representatives and those contracted to undertake technical work on their behalf in for example research and development organisations, universities and private companies.[3] Regional council regulatory and technical staff and government research and innovation agents also attend and participate in such events. Collectively, attendees would attest to having shared goals in the sustainable development of geothermal resources in their overall sharing for example of technical industry developments, case studies and regulatory policy, and through the regular attendance of participants at such events over time (often decades).[4]

The current regulatory compliance approach for managing large-scale use of geothermal resources may be the right regulatory fit for a number of reasons, including its allowance for regulatory conversations between the regulator (regional council staff), peer review panellists and resource consent holder. However, for regulatory conversations to contribute legitimately as a regulatory tool, Black has identified four necessary criteria. These are: commitment, access, authority and trust and accountability. The following section expands on these criteria and identifies potential pitfalls in their successful application.

For the purpose of this chapter, regulation includes rules derived from RMA principles and provisions. These include national and regional policy statements, regional plans and resource consent conditions (including system management plans) and are all legally enforceable.[5]

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[2] Wendy Wagner and Rena Steinzor (eds) *Rescuing Science from Politics: Regulation and the Distortion of Scientific Research* (Cambridge University Press, 2006) at 6 and 7.

[3] Personnel in the New Zealand geothermal industry include government officials (regional and central government), tertiary institutes, Crown Research Institute – GNS Sciences, and development companies; see Stephen Daysh and others "2015—2020 New Zealand Country Update" (from proceedings World Geothermal Congress, Iceland, May 2020) at [8].

[4] For example, see New Zealand's membership with the International Energy Agency, Geothermal Integration Agreement at <www.iea-gia.org>; and long-standing association with the International Geothermal Association <www.geothermal-energy.org> through the New Zealand Geothermal Association <www.nzgeothermal.org.nz>. Since the 1970s central government recognised the value of geothermal development expertise. The Geothermal Institute (University of Auckland) is a world leader in technical training programmes, and government currently contributes approx. NZD 6.5 million to geothermal research annually. Approx. NZD 2.4 billion has been invested in geothermal developments in New Zealand by government and private industry, since 2005. See Brain White *Case for New Zealand Membership of the International Partnership for Geothermal Technology* (document prepared with help from the New Zealand Geothermal Community, 23 August 2011) at 3 and 23.

[5] RMA 1991 ss 2 and 43AA rule means district or regional rule. See further commentary in *Environmental Defence Society Inc v King Salmon* [2014] 38 NZSC at [112] – [116] and [122].

A The RMA 1991 Framework and Compliance-based Regulation

A central feature of the RMA is that its resource permitting requires activities to be carried out in compliance with the resource consent process and resource consent conditions which are developed, monitored and enforced at the regional-level.[6] It is also notable in the context of this chapter that under the RMA regional authorities carry out a multiplicity of roles which in other countries might usually be carried out by separate government agencies.[7] While the "many hats" nature of local authority roles under the RMA may provide regulatory advantages and a "one-stop-shop" for many environmental and resource allocation matters, a disadvantage in the regulatory context is that it can leave regional and local authorities prone to industry capture[8] and to short-term or silo mentality in decision-making. Under the RMA, a regional authority is responsible for regional resource management, including resource planning and allocation, sustainable management under the resource permitting process and the regular review of the effectiveness of its polices, plans and rules. Central government and non-governmental agencies have reported on the implications of the heavy demands placed on local authorities under the RMA in the resource consent compliance, monitoring and enforcement context.[9] These reports have consistently shown that such matters as agency capture, agency capacity and a lack of national direction all negatively impact the RMA's purpose.[10] The current government's resource mangement reform agenda also highlights the need for greater use of mandatory national direction, a wider range of principles-based mechanisms to allocate resources and improved compliance monitoring and enforcement by local authorities.[11]

Compliance-based regulation is widely recognised in international regulatory practice as a major strand of regulatory strategy and policy and is understood as a holistic approach to

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[6] Jennifer Caldwell and others *Conditions of Consent* (paper presented in Resource Management Law Association Roadshow, July 2014) at 3 and 4.

[7] For example ongoing policy and rule development, resource allocation and compliance monitoring and enforcement.

[8] Toni Makkai and John Braithwaite "In and Out of the Revolving Door: Making Sense of Regulatory Capture" (1992) 12 Journal of Public Policy 1 at 61.

[9] See Ministry for the Environment *Compliance, Monitoring and Enforcement by Local Authorities under the Resource Management Act 1991* (November 2016); and Marie A Brown, Raewyn Peart and Madeleine Wright *Evaluating Environmental Outcomes under the RMA* (Environmental Defence Society, Auckland, 2016).

[10] Brown, Peart and Wright (2016), above n 9, at 6.

[11] See Ministry for the Environment (online) *Independent Review of the Resource Management System* "Summary of the Review" and "System Efficiency and Effectiveness" at <www.mfe.govt.nz/rmreview> (January 2021). See further Ministry for the Environment *New Direction for Resource Management in New Zealand* (Resource Management Review Panel, June 2020); and Hon Simon Upton, Parliamentary Commissioner for the Environment *RMA Reform: Coming Full Circle* (Salmon Lecture, Resource Management Law Association, 2020).

regulatory design, implementation, monitoring and enforcement.[12] It is often identified with the use of persuasive and collaborative strategies by regulators to win regulatee cooperation, and is distinguished from deterrence-based regulation; this involves prosecution and punishment.[13] As an enabling planning instrument, the environmental planning requirements and processes under the RMA allow for development of natural resources and resource use within constraints. Although some activities are prohibited, most regulation for resource use activities is enabling and compliance-based.[14] For example, an assessment of environmental effects (AEE) requires a resource consent applicant to present a consent authority with information about how adverse environmental effects will be avoided, remedied or mitigated.[15] The *applicant* formulates resource consent conditions and makes an AEE regarding the resource use for which the regulator (regional council) may give approval.[16]

This legal requirement could be viewed as a first step in gaining consent holder buy-in as part of the RMA's compliance-based regulatory approach. Often the applicant's expertise in complex resource consent applications makes the applicant more qualified than the regional council to formulate complex consent conditions (and management plans). In this way not only is the application and consenting process gaining buy-in, it also matches features of a partially self-regulated regulatory regime.[17] After considerable initial investment (often in the region of millions of dollars), a resource consent applicant will naturally assume a proprietary ownership of "its development project". While not problematic in itself and in certain respects justifiable, proprietary assumptions that affect regulatory management are another matter.

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[12] Christine Parker "Reinventing Regulation within the Corporation: Compliance-oriented Regulatory Innovation" in Colin Scott (ed) *Regulation* (Dartmouth Publishing, United Kingdom, 2003) at 529.

[13] At 391 and 393.

[14] See RMA 1991 s 87A classes of activities.

[15] RMA 1991 s 104 and sch 4.

[16] Personal communication with Waikato Regional Council staff member (August 2017): "The weakness in our practice is that conditions are only scrutinised by the regional council if they are contested at the time of application otherwise they are accepted without further analysis. Generally, the regional council will not contest them. I am not aware of any conditions being contested by the council. It appears to me that resource management needs are considered only if they are put in the Regional Plan as a requirement. The applicant is reluctant to propose anything disagreeable. They also have greater motivation at a later date to get things removed from the conditions, at which time the consent authority is at a disadvantage for not knowing why the condition was proposed initially."

[17] For a discussion of various forms of self-regulation see Julia Black "Decentering Regulation: Understanding the Role of Regulation and Self-Regulation in a 'Post-Regulatory' World" (2001) 54 Current Legal Problems (Oxford Academic Journals) 1, 114-121.

B Regulatory Conversations in Compliance-based Regulation

Focusing on conversations highlights the dynamic part of the regulatory process. Black defines and situates regulatory conversations as:[18]

> [C]ommunications and discussions between a regulatory official or officials and a regulated individual or firm as to the application of a generally applicable rule in their particular case. Rules in this sense include primary, secondary and tertiary rules, and so may be embodied in, *inter alia*, statute, regulatory rules, circulars, guidance, licenses or franchise agreements. Conversations are not synonymous with regulation; rather they are a feature of the day to day operation of a regulatory system and the interaction between regulator and regulatee concerning the meaning and application of rules. […] [A]ttention is placed on those conversations which occur within the regulatory framework once it has been set. Conversations may occur at a number of different points within the regulatory process and with officials in different parts of the regulatory organisation.

For the purpose of this chapter's analysis, regulatory conversations according to this definition could mean conversations during the resource consent application and consent-granting phase; the on-going conversations between a regional authority, a consent holder and the PRP regarding compliance with consent conditions, and system management plan (SMP); or the conversations between a consent holder and a PRP alone. Referring to the above quotation, the main focus area regarding "the application of a generally applicable rule" of this analysis relates to the application and interpretation of resource consent conditions (conditions as the rules by which the consent holder must operate) and policy which require the provision of information held by the consent holder to a regional council and PRP. As identified in chapter four, two issues contribute to an understanding of this generally applicable rule regarding supply of information to the regulatory authority. These are: the scope of the PRP's role and the authority of the regulator and panel to require information and data regarding the operations of a resource consent; and whether "collegiality" impacts these. Before proceeding however, "conversations" in Black's use of the term are explained.

1 Conversations and the Interpretative Community

Conversations have the postmodern credentials of flexibility, communication and responsiveness. These enable individual, regulated parties to participate in the decision round the application of rules in their case.[19] In examining the use of conversation in the regulatory

[18] Black (1999), above n 1, at 247 and 248.

[19] At 246 and 247.

process, Black identifies that conversations can raise issues of consistent, fair and objective treatment and of access, participation and accountability.[20] Due to the inherent problems associated with rules in any context—namely rules' tendency to over- and under-inclusiveness, their indeterminacy and interpretation—Black's analysis of regulatory conversations also explores "regulatory interpretive communities" as an aid to understanding the role of conversations.

Rules need "an informed audience, one which understands the context of assumptions and practices in which the rule is based, which gave rise to it, and which it is trying to address".[21] For a rule to work in a sense of being applied in a way that would further the overall aims of the regulatory system, the person applying the rule must share the rule-maker's interpretation of the rule; they have to belong to the same interpretive community.[22] The rule maker must know whether the terms that will be used are clear to those interpreting the rule and if the rule will give the certainty that is demanded.[23] Additionally, the rule maker must know the extent to which the rule's addressees can be relied upon to "read in" the tacit assumptions on which the rule is based. This factor has a direct bearing on the question of the degree of precision which is necessary in a rule. The greater the shared understanding of the rule and the practices it is addressing, the more the rule maker can rely on tacit understandings regarding the aim of the rule and context in which it operates. Within a natural resources law context and one where publicly owned resources are exploited for private gain, this thesis argues that "tacit assumptions" about rules should be avoided in the interests of transparency and accountability.

A consent holder's role in formulating its resource consent conditions and SMP helps enable a consent holder to be "on the same page" as a regulator because the consent process often involves several iterations of resource consent conditions and an SMP before consent is granted. Having a shared view helps both sides to reach understanding and agreement about necessary requirements.[24] Peer review panel expertise also helps bridge any gaps in a regional council resource consenting staff's knowledge and understanding of the technical aspects of

[20] At 247.

[21] Julia Black *Rules and Regulators* (Clarendon Press, Oxford, 1997) at 12.

[22] At 30 and 31. Regulatory interpretive communities are those involved in the regulatory system, rule makers, regulatees, enforcers, and adjudicators sharing interpretive strategies. Such communities are constituted by institutional practices which may exist in the form of shared cultures, norms, goals, definitions and can be created through, for example, training and education.

[23] At 30-31.

[24] Black (1999), above n 1, at 258.

geothermal resource management. However, as shown in chapter four disparate understandings can exist among parties in the interpretive community regarding the application of resource consent conditions for information supply and the authority of a PRP and regional council to request certain information and data generated under resource consents.[25]

Similarly, the strong representation of the geothermal industry (primarily, resource consent holder companies) in recent Waikato regional policy and plan development can be viewed as creating an interpretive community among geothermal industry professionals (largely, those associated with developing geothermal resources and those who service the industry) and regional councils and peer review panellists. The fact that geothermal resource extraction rates are determined at resource consent level rather than through policy or rule criteria supports this view.

C Regulatory Conversations in Monitoring and Enforcement

Regulatory conversations can occur at different points in the regulatory process. Conversations which occur during routine monitoring and enforcement of policy and rules are now considered.[26] Black explains these are frequently accompanied by their own set of rationales and advantages and are often as much about promoting a willingness to comply as about ensuring exact compliance with a particular rule.[27] For example, a compliance approach in which monitoring and enforcement conversations feature is often adopted where there is an on-going relationship between the regulator and the regulated and particularly where the individuals involved know one another or share a common background or outlook.[28] As is the case with geothermal resource management, interactions occur on an on-going basis between a regional council (usually an assigned resource consent officer, a geothermal scientist and possibly a senior management officer) and usually one representative of the consent holder. Consent holder representatives may be known to regional council staff over a number of years (even before the formal resource consent application and granting phase) and resource consenting staff may remain in their role over a number of years. Additionally, prior to being selected as members, it is often likely that the PRP members are known to the consent holder in a professional capacity within the geothermal industry and may remain as a panel member

[25] See discussion of official information law's application, herein chapter four.

[26] Note Black's definition of "enforcement" in this context includes all compliance-seeking activity by the regulator.

[27] Black (1999), above n 1, at 259.

[28] At 259.

for an assigned resource consent for decades. The compliance approach also prevents alienation of the regulated; the greater the feeling of alienation, the less the regulated is likely to implement the necessary measures to ensure on-going compliance. Long-term relationships and the collegial management style emphasise the importance of and need for management process integrity from both an overall regulatory management perspective and for PRP processes.

The acknowledged collegiality among regulator members and a consent holder reflects the compliance approach where conversations feature. The regulator has provided a non-alienating space in which compliance monitoring occurs.[29] However, despite this regulatory "positive", without certain procedural requirements the collegial compliance monitoring approach can be left open to the "negatives" of lack of transparency, capture, condoning of breaches and illegitimate alteration of regulation.[30]

For example, Black warns that the danger of conversations is in part that they have the potential to "confer on the regulation a schizophrenic character"—that the regulation publicly represents one thing while in practice operates quite differently:[31]

> It is not simply this bifurcation which is problematic, however: the principal sources of difficulty are rather the conditions in which and degree to which this difference occurs, and further the extent to which the decisions as to the rule's application are being determined by a body which is not recognised as legitimate to make those decisions. It is when an exceptions process, for example, effectively becomes a vehicle for policy change that objections may arise. Or where it is the regulator who is alone determining the nature and terms of the bifurcation for unless an idea of legal pluralism is accepted, the regulator lacks the legitimacy which the court is afforded to determine the meaning and application of the rule in particular instances. The practice may lay the agency open to the charges of capture, inconsistency and inequity, of emptying law of any meaningful content, and of undermining the regulation, and more particularly, its public interest or social objectives. This is particularly so if the adjustment of the rule is largely invisible to those observing the agency, or even to others within the regulatory system.

Regulatory breaches or obfuscation may be unintentional on the part of a regulator. At one level, such instances can be seen as examples of the familiar trade-off between efficiency and

[29] Essentially, decentred regulation involves a shift (and recognition of it) in the locus of the activity of regulating from the state to other, multiple, locations, and the adoption on the part of the state of particular strategies of regulation. See Black (2001), above n 17, at 112; and P Selznick *The Moral Commonwealth: Social Theory and the Promise of Community* (1993) at 470.

[30] Black (1999), above n 1, at 265.

[31] At 263 and 264.

due process. The practice of adopting a compliance approach in enforcement has attracted significant criticism on the grounds that pragmatic condoning of breaches (or obfuscation) of rules is effectively an illegitimate alteration of the regulation in favour of the regulated that undermines central policy aims.[32] Current geothermal regulatory compliance monitoring (including the conversations between all parties as well as standard reporting and assessment resource consent requirements and the work of PRPs) shows that there is some hesitation on the part of regional councils (including panel members) to press consent holders for more information and data than is sometimes provided by them in their annual or quarterly reports.[33] Where a consent holder claims commercial sensitivity for data or information or holds that such information requests are outside the bounds of information that it should provide under resource consent conditions, a regional council's response has been not to insist on fulfilment of the request for fear of alienating the consent holder and compromising the regulatory relationship. Where such data and information forms a necessary part of the monitoring and review process to ensure sustainable use of the regional geothermal resource or to assess the rate of extraction from and health of an individual geothermal system, such an impasse or "familiar trade-off" is unacceptable. Furthermore, as shown above, current Waikato regional policy publicly represents sustainable use and management of geothermal resources, particularly for a layperson's reading of the policy and rules. In practice however, a resource consent holder is *not* required to use an individual development geothermal system sustainably.

Regulatory conversations are not acceptable or effective if the overall legislative objective of sustainable management of resources under the RMA is compromised by them. This thesis's examination suggests that current geothermal resource management policy definitions, explanations and rules require reconsideration and adjustment to better align with the RMA's purpose. Regarding the particular matter of consent holder supply of information and data, a regulator relies on and must ensure that the consent holder supplies specific information and data so that it can assess compliance and ultimately sustainable resource management for the (Waikato) regional resource. Unequivocally, it should be for a regional council to make this assessment, not a resource consent holder.

[32] At 265. See also F Pearce and S Tombs *Ideology, Hegemony and Empiricism: Compliance Theories of Regulation* (1990) 30 JB Crim 423.

[33] Personal communications with Waikato Regional Council staff member (April 2017).

D The Legitimacy of Regulatory Conversations

For their successful operation, conversations also depend on trust and legitimacy which cannot simply be achieved by improved organisational or procedural design.[34] According to Black, instances of bilateral rule-making (such as resource consent conditions and SMPs) depend significantly on the degree to which the regulator is prepared to trust the regulated to formulate rules which will meet overall policy goals. Such bilateral rule-making and compliance approaches also depend on the degree to which the public is prepared to trust both the firm (a resource consent holder) and regulator (a regional council) to construct a system of regulation which will in fact achieve policy goals.[35]

Referring to resource consent assessments of environmental effects by resource consent applicants, the High Court stated that such environmental effects assessments are the bedrock upon which resource consent applications are founded and that "the need for accuracy and integrity in the application documents is self-evident".[36] In further support of this self-evident need, the High Court reminded that it is "obvious" that when a consent authority imposes resource consent conditions "it is entitled to assume that the applicant and its successors will act legally and adhere to rules and conditions".[37] Nothing could ever be approved if consent authorities had to work on the contrary assumption, namely that its rules and conditions would not be observed.[38] Through these statements, the High Court identifies and highlights the central importance of the assumed relationship of trust between a consent authority (the regulator) and consent holder (the regulated).

Black contends that concerns about regulatory decisions or bilateral rule-making are fundamentally linked to legitimacy concerns and expectations which surround the role (and rule) of law.[39] It may be that in undermining the uniformity of a rule by its individualised adjustment, conversations illustrate what may be described as the legitimacy paradox of regulators. For example, conversations involving a compliance approach to enforcement may be necessary to maintain the legitimacy and acceptability of the regulation to one community,

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[34] Black (1999), above n 1, at 265.

[35] At 265.

[36] *New Zealand Wind Farms Ltd v Palmerston North City Council* [2013] NZHC 1504.

[37] *The Strand Ltd v Auckland City Council* [2002] NZRMA 475 (HC), at [19].

[38] At [19].

[39] Black (1999), above n 1, at 265 and 266.

the regulated. However, they may be seen by others as an illegitimate approach to adopt and furthermore as evidence of collusion between regulator and regulated, of capture and too cosy relationships.[40] Black explains:[41]

> The use of law inevitably imports a set of values with which the regulatory system has to conform: "rule of law" values that law should be certain, general, open, stable and prospective. Moreover, the governmental nature of the bodies operation the regulatory system imports a further familiar set of values: of due process, transparency, openness and participation. Thus although the law does not play the determinative role which classic formulations of the legal paradigm ascribe to it (that which the rule says is what the world does), the values which are embodied in the liberal legal paradigm do influence the expectations actors have of the manner in which law, or those administering it, should operate. […] The inevitability of conversations indicates that [such] issues have to be addressed if regulation is to retain a degree of effectiveness and acceptability both the regulated and to society as a whole.

Can the institutional structure which surrounds regulatory conversations in geothermal resource management regarding both policy and rule development and the development and application of specific information provisions be adjusted to enhance the legitimacy and effectiveness of regional policy and rules?

Since the late 2000s, the Waikato Regional Council, geothermal industry stakeholders and the courts have developed sophisticated policy and rules. While geothermal energy developers largely comply with resource consent requirements, it is questionable whether the consent authority's regulatory style and the reluctance of regional councils to take enforcement action over information supply issues would stand up to the ultimate legitimating test of the rule of law. To date, no enforcement measures have been taken by regional councils against geothermal resource consent holders regarding this issue, nor has a "test case" or declaration from the Environment Court yet provided guidance. As shown in chapter four, court and EPA decisions have routinely taken an overall broad judgment approach to interpretations of sustainable management of resources under the RMA. Whether this approach should continue to be taken either under the RMA or its successor legislation is a pertinent question.

[40] At 266.

[41] At 266 and 267.

E Criteria for the Acceptability of Regulatory Conversations

Black suggests that four elements are central to the effective operation and acceptability of regulatory conversations. These are:[42]

- commitment of its principal participants (regulator and regulated) to a meaningful discourse;
- the nature and opportunities of others to access the conversation; and how publicly visible is the issue?
- the distribution of power and authority between the different conversants; and
- the trust and accountability which exists between participants and which surrounds the regulatory system.

These criteria are explored in turn to ascertain the "acceptability" of regulatory conversations in the geothermal resource management context regarding information and data supply by consent holders to the PRP and regional council and regarding policy and rule formation. It is also important to examine the criteria because, as identified in chapter two, modern regulatory practice requires a deep and nuanced institutional analysis of the motivations, interactions and institutional environments of the regulatory actors in regulatory regimes.[43]

1 Commitment of Principal Participants

The commitment of the principal participants is crucial.[44] A regional council, PRP and a consent holder are the suppliers of information and data about natural resource management and the operation of the natural resource bargain. If a consent holder who holds the balance of power as to information asymmetry were to take advantage of the collegially styled regulatory relationship in making claims of commercial sensitivity in withholding information and to be generally reluctant towards participating meaningfully, it is not difficult to see that these factors would result in a substandard regulatory outcome, especially in a case where a regulator and PRP members may be reluctant or uncertain about insisting on the supply of specific information and data from a consent holder. A regulator may be reluctant or uncertain for a number of reasons and a consent holder may have multiple reasons for its own position. A regulator may not have previously resorted to formal enforcement measures regarding the issue and it may be wary of alienating the consent holder. The positions taken by regional councils in other regions (regulatory monitoring and enforcement position and formal policy position)

[42] At 267 and 268.

[43] New Zealand Productivity Commission *Regulatory Institutions and Practices* (June 2014) at 4.

[44] In the RMA 1991 context the public's role is also crucial, see chapter three's discussion of *New Zealand Rail Ltd v Marlborough District Council* (1993) 2 NZRMA 449 (PT).

can differ, hence creating uncertainty as to the correct course of action. A consent holder may have its own interpretation on what constitutes best use of geothermal resources and for economic reasons may be influenced by short-term incentives and the interests of its shareholders. Consent holder claims of commercial sensitivity could also be made to withhold information which might compromise its current resource use or it may wish to keep information hidden from the wider research community.

Commitment of various principal parties is also observable in the Waikato Regional Policy Statement and Regional Plan (rule) development process where the geothermal industry (particularly consent holders) submitted on proposed policy and plan changes which were finally agreed upon after protracted negotiations with the regional authority.[45] Public input during this process was minimal.[46] In examining submission documents, consent holder submitters' capacity for commitment to a particular policy and rule outcome appeared to outweigh the Regional Council's capacity to provide for alternatives.

The resulting Waikato Policy and Plan fail to provide members of the public with adequate information about large-scale use of geothermal resources. This basic lack of environmental information effectively excludes laypersons from having any awareness of environmental issues relating to large-scale geothermal resource use. How can the public act as a principal participant, never mind a committed one, in a policy and rule development conversation where basic information about the natural resource in question and related environmental issues are absent? For a regulator, conversations are a way of addressing the information asymmetries which inevitably exist between regulator and regulatee concerning the latter's operation. However, if the regulatee also controls the conversation and is more committed to reaching an outcome satisfactory to its own ends, this situation is problematic and especially so in natural resources law where law and regulation should be designed to manage private development of publicly owned resources in a way which benefits the public functions of property in natural resources.

[45] See for example, Waikato Regional Council *Waikato Regional Policy Statement – Proposed Change No. 1 – Geothermal* (Hearings Committee Decisions Report, June 2004); Waikato Regional Council *Proposed Waikato Regional Plan, Proposed Variation 2 – Geothermal* (Hearings Committee Decisions Report, June 2004); and Waikato Regional Council "Report to Parties regarding RPS and WRP Geothermal Appeals Position Paper: Allocation of the Geothermal Resource Over Time" (discussion document no.973493 (v1) 1 April 2005).

[46] For example, only 13 members of the public made submissions on the proposed Regional Policy Statement and Regional Plan changes for geothermal resource management; 10 were individual members of the public, two were small businesses (honey producer and glass blower), and one a geothermal tourist operation.

2 *Access to Regulatory Conversations*

Who has access to and who participates in regulatory conversations can simultaneously be the most necessary and the most contentious aspects of regulatory conversations. The regulated's desire to maintain the privacy and confidentiality of its operations may mean that opening up the process to others can mean that the conversation ceases or moves to a more private forum.[47] Unlike scenarios referred to by Black, where regulatory conversations concern rule waivers for example, a number of issues may arise in the geothermal regulatory context: a desire to maintain privacy (indeed by both parties) because lack of exposure maintains the status quo; a regulator's choosing non-action regarding compliance enforcement; and a consent holder's remaining recalcitrant (albeit collegially, claiming commercial sensitivity) regarding information and data supply to a regulator and peer review panel.

By extending Black's definition to include regulatory conversations about policy and rule development, her criteria can provide insight about public or others' access to geothermal policy and plan development conversations. Within the RMA's formal public participation processes and the formal submissions received on the current Waikato geothermal policy, no submissions were made for example by an environmental advocacy group for geothermal resources. Moreover, few members of the public made submissions. The primary submitters were private companies involved in industrial-scale development of geothermal resources and central and regional government agencies variously connected to geothermal resource management. The New Zealand Geothermal Association and Crown Research Institute GNS Sciences also provided submissions. Unlike other environmental concerns, concerns around geothermal resource management are not represented by NGOs such as Greenpeace and Forest & Bird.[48]

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[47] Black (1999), above n 1, at 271.

[48] Historically, Auckland University Professor Ronald Keam advocated for protection of geothermal resources in *Minister of Works and Development v National Water and Soil Conservation Authority and Keam* (1981) 7 NZTPA 289; and *Keam v Minister of Works and Development* [1982] 1 NZLR 319, (1982) 8 NZTPA 240. The Environmental Defence Society (New Zealand) also advocated for geothermal resource protection, see RF Keam (ed) "Geothermal Systems: Energy, Tourism, and Conservation" (1982) (from proceedings Nature Conservation Council, Rotorua, October 1981). See also, Katherine Luketina (Waikato Regional Council) "Sustainability and the Democratic Process" (from proceedings World Geothermal Congress, Indonesia, April 2010) at [1] regarding current geothermal policy input by various "stakeholder" groups. While the Environmental Geothermal Protection Society were party to proceedings (via RMA 1991 s 274) in *Rotokawa Joint Venture Ltd v Waikato Regional Council* EnvC Auckland A41/07 (18 May 2007) at [5], this society now seems disbanded.

3 *Distribution of Authority*

The effectiveness of the conversational approach and the legitimacy of the conversational process are primarily contingent on who has the authority to determine the interpretation and application of the rule.[49] Difficulties arise where authority becomes blurred or unclear, as may be the case where the peer review panel (PRP) plays a significant role in advising the consent authority regarding consent holder compliance. Although the panel's role is delegated compliance monitoring under the RMA, in practice the collective expertise of panellists carries much weight in final decisions reached concerning resource consent applications and resource consent compliance.[50] Although a resource consenting officer will attend annual report meetings between the PRP and consent holder, it is the panel (not the regional council) which collectively conducts the review of consent holder reports prior to such meetings.

Black observed that if the "immediate regulator" does not have authority to interpret the rules (for example, the panel delegated with its review task), "possibilities are opened up of strategic play by the regulated to force the immediate regulator to agree with it rather than have the matter referred on" (ie referred on by PRP to regional council).[51] Keeping authority to determine rules within the regulatory system (for example, by excluding the court or third-party oversight) has the implication that it may permit the development of an interpretive community (ie a shared body of understanding as to the meaning and application of rules within the regulated community). It could be suggested that the rule regarding information supply by the consent holder does not *require* an interpretive community in a positive sense. It is an unambiguous legal requirement, the understanding and application of which appears to be clouded by a number of the factors discussed above.

An interpretive community may however have a negative effect when it perpetuates the status quo. It is arguable that it is now geothermal industry expectation that regional council staff (and panellists) will not press consent holders for information and data where consent holders make commercial sensitivity claims or claim that such requests are ultra vires the resource

[49] Black (1999), above n 1, at 272.

[50] See Kenneth Palmer *Environmental and Resource Management Law* (online ed) Part 4 at [4.65]: If the settling (and arguably monitoring) of consent conditions is delegated to a third party, that party may only act as "a certifier, using that person's skill and experience, rather than as an arbitrator to judge how a matter is to be provided for". With this in mind, interestingly, the Northland Regional Council *Ngawha Reservoir Management Plan* (Stage II, March 2011) at [1.2] states the peer review panel, in consultation with the consent holder, "will be the arbiter of the resource consent". Usually, arbiter means a person who settles a dispute or has ultimate authority in a matter.

[51] Black (1999), above n 1, at 273.

consent conditions. Similarly, through its creation of an interpretive community associated with determining geothermal resource extraction rates at individual system level through the resource consent process, Waikato Policy and Plan omissions of explanations or definitions for geothermal resource renewability and sustainability (of the regional geothermal resource and of an individual geothermal system) can be seen as another example of geothermal consent holders' perceived authority in controlling the interpretation and application of sustainable management under RMA s 5.

According to regulatory experts Ayres and Braithwaite, the importance of business subcultures of resistance to regulation means that one "must understand the significance of industry-wide forces beyond the agency of the single firm", and that in some respects industry associations can be more important regulatory players than single firms.[52] For example, individual firms will often follow the advice of the industry association to cooperate on a particular regulatory requirement because "if the industry does not make this requirement work, it will confront a political backlash that may lead to a more interventionist regulatory regime".[53]

In both examples however (the regulator's access to consent holder information and data and the collective interpretation of sustainable resource use within the geothermal interpretive community), the geothermal energy industry has considerable authority in maintaining the status quo in that regional (and political) strategies strongly encourage transitions to and further development of renewable energy resources. Additionally, a more "interventionist" regulatory regime may be beyond the resource capacity of the regulator or the direct interests of the government of the day.

4 Trust and Accountability

The final elements that are essential for the effective conduct and accountability of regulatory conversations are trust and accountability. Although trust was discussed above, "trust" here refers to accountability broadly. Trust is important at a number of levels: a consent holder must trust a consent authority to treat it fairly and consistently; the consent authority must trust the consent holder to provide information about its activities honestly; and the public should (be able to) trust the consent authority not to act arbitrarily and not to deviate from or otherwise prejudice the social goals which the regulation is meant to achieve. Trust can be developed

[52] Ian Ayres and John Braithwaite *Responsive Regulation: Transcending the Deregulation Debate* (Oxford University Press, 1992) at 39.

[53] At 39.

essentially by the regulator's establishing a reputation for fair and consistent treatment and resistance to industry capture. Black suggests that such a reputation can be engendered through:[54]

> [A] willingness to be accountable; to provide qualitative information as to the broad content and nature of the conversations which is has. These could be post hoc reports as to the extent and nature of guidance, rulings or waivers given; the publication of firms' rules which have been approved, for example, and statements of enforcement practice. Consistency of treatment can be ensured through internal reporting systems and centralised monitoring and recording of enforcement practices, guidance, rulings or waivers, and qualitative assessment of firm-written rules.

A focus on trust emphasises the need for regulation to be responsive not just to wider interests in its formation and to the regulated in its operation, but also to the claims of society as a whole in the integrity of its function.[55] This point emphasises the importance and relevance of multilateral interests in natural resource management where traditionally the natural resource bargain has been a bilateral agreement.

Although regulatory monitoring of large-scale geothermal resources is generally invisible to the public, there are benefits in making monitoring outcomes and resource information publicly available. For example, this could mean having documentation of regional council and PRP processes (and measures taken) on an official record and regularly making information and data public (perhaps after a holding period)[56] to protect commercial interests of the consent holder (where justified). As to engendering a reputation within the geothermal industry, regional councils might work on further aligning their respective regulatory measures (policy, regulation and processes) for PRPs. Not only would doing this help promote accountability, trust and equal treatment, it could also help counter geothermal industry resistance sub-culture regarding resource consent information requirements.

The issue of Waikato Policy and Plan omissions about geothermal renewability and sustainability, although linked to resource consent compliance, is perhaps more fundamental and could be addressed by developing policy to require consent holders to regularly report on the future, projected state of the geothermal system (during and at the end of the consent period)

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[54] Black (1999), above n 1, at 275-276.

[55] See also Martin Lodge and Lindsay Stirton "Accountability in the Regulatory State" in *The Oxford Handbook of Regulation* Robert Baldwin, Martin Cave and Martin Lodge (eds) (Oxford University Press, Oxford, 2010) at 358-359.

[56] See herein at chapter seven.

and by developing regional policy to rest and rotate the use of geothermal systems subject to large-scale exploitation and to require planning for and consideration of alternative uses of the resource. Additionally, the Waikato Regional Policy and Plan could reinstate informative content about geothermal resource renewability and sustainability to enable members of the public to understand resource management issues in private, industrial-scale exploitation of the resource. Energy-specific and resource data reporting at national-level for regional councils could also strengthen their mandates as identified in the previous chapter.

III Key Points

Regulatory conversations are an inevitable part of a conventional regulatory process. Although a collegial-style of approach may be effective overall for compliance-based regulation, without procedural constraints and clarity regarding roles and authority the collegial style may be perpetuating a negative status quo (ie a shortfall in fulfilling statutory requirements concerning supply of information by resource consent holders and, more broadly, a shortfall by regional councils in fulfilling RMA ss 5 and 35). Using Black's regulation analysis as an analytical framework, the chapter analysed the regulatory functions of the regulator and peer review panel and the working relationship with the resource consent holder. The chapter highlighted aspects of the regulator's regulatory approach which work well and areas which, according to Black's criteria necessary to legitimise regulatory conversations in compliance-based regulation, are prone to management and process pitfalls.

The purpose of the chapter was to show that by exploring and analysing the regulatory relationship, regulators can be better equipped to fulfil their statutory duties. This idea is broadly supported by the regulatory literature and by New Zealand's Productivity Commission report's (2014) advice for modern regulatory practice to examine the motivations, interactions and institutional environments of regulatory actors in regulatory regimes.

CHAPTER SIX

FISHERIES RESOURCES LAW

I Introduction

Marine fisheries management is highly useful for examining information-related challenges in natural resources law because it is characterised by high information needs, Māori and public ownership of resources, high levels of fishing industry involvement in research and resource management and the need for sustainable resource use. This chapter examines the legislative information requirements of the Fisheries Act 1996 (the Fisheries Act or the Act) and related legislation and regulations for commercial marine fishing, Māori customary fishing and recreational fishing. It also reviews the Fisheries Act information principles pertaining to Ministry for Primary Industries (MPI), Fisheries NZ (FNZ) decision-making and FNZ's research and research processes.

Like geothermal resources, the ocean fisheries resource is renewable but must be harvested sustainably. Permit-holder reporting serves the dual function of regulating the quantity and species of fish extracted, while also informing species sustainability decision-making and information about the environmental effects of fishing activity (such as bycatch in mammals and seabirds). While partly informed by permit-holder reporting, science research information about environmental effects of fishing and species sustainability is conducted by FNZ with little substantive guidance from the Act. The Fisheries Act's information and environmental principles are the only guides regarding fisheries science information within the Act. While this chapter discusses both information reported by permit holders and science research information informing management decisions, the science research process is given the greatest attention.

A brief overview of the privatisation of fisheries rights under the current quota management system (QMS) and subsequent developments under current legislation show the roles of different parties in the natural resource bargain. Historically, these were primarily the state and the commercial fishing industry. The absence of Māori and multilateral interests has influenced the development of the current fisheries regime. While Māori stakeholding in commercial

fisheries under Treaty settlement legislation now places some iwi in a strong position economically, *customary* fishing and legislative tools under the Fisheries Act and customary regulations have resulted in poorer outcomes for Māori economically and culturally.

The chapter has five main parts. Part two provides a brief overview of privatised fishing rights, the QMS and Māori fisheries rights. Part three explains fisheries management under the Fisheries Act, the Act's information and environmental principles and the courts' interpretation of these. Part four then sets out the statutory information requirements of commercial permit holders, customary users, recreational users and the information requirements pertaining to FNZ. Here, Black's theory of regulation is used; particularly with reference to commercial permit-holder compliance, and to examine the efficacy of information requirements under customary fishing regulations. Part five explores information provisions and information processes for fisheries management research. This exploration examines fisheries science, peer review process criteria and the sources of fisheries research that inform FNZ management decisions. Pathways for better inclusion of ecosystem-based management and greater incorporation for mātauranga Māori information are also noted.

In comparison to geothermal resource management, New Zealand's marine fisheries management has attracted a greater concentration of academic, interdisciplinary attention, particularly since the introduction of the QMS. Moreover, the legal and market mechanisms under the QMS are more complex and have been subject to greater legal review and amendment than has the geothermal management system. Therefore, while this chapter is systematic in its natural resource law analysis (as in the earlier geothermal chapters), it enters the narrative with both a richer literature base and a generally pared back analysis of QMS mechanisms in order to encompass the wide range of information issues within fisheries management. It also acknowledges the current government's intention in signalling a more holistic, integrated approach to managing oceans, including fisheries.[1] The chapter's focus however remains squarely on statutory information provisions and information processes in the management of marine fisheries.

[1] See Cabinet Paper "Oceans and Fisheries Portfolio – Ensuring Healthy Ocean Ecosystems" (2 July 2021); and Ministry for the Environment and Statistics New Zealand *Our Marine Environment 2019* (October 2019).

A *Aotearoa New Zealand's Marine Area and Fisheries*

Before the arrival of Europeans in Aotearoa, Māori fished extensively for both subsistence and trade, coastally and off-shore.[2] Māori were expert ocean navigators and had deep understanding of the seasons and of the habits and habitats of fish species. Cosmology and whakapapa (genealogy) underpin a Māori world view where all animate and inanimate are related with the environment.[3] All Māori tribes give an account of Aotearoa's landmass as born through fishing.[4] Management of fisheries was guided by tikanga (Māori custom) and tribal fishing boundaries were prized and guarded. Access to, benefit from and management of Māori fisheries was highly localised and developed.[5] Te Tiriti o Waitangi guaranteed Māori retention of ownership of their fisheries, a guarantee that is now partly reflected in law.[6]

Today, Aotearoa New Zealand's marine area is the sixth largest of any country worldwide. It covers an area of 4,400,000 km^2, an area 14 times larger than terrestrial New Zealand.[7] Surrounded by the world's largest ocean, the Pacific, New Zealand's marine area includes its territorial sea, Exclusive Economic Zone (EEZ)[8] and extended continental shelf which in some places extends far beyond the EEZ.[9] The marine area supports a wide array of marine life with high biodiversity in seabirds, marine mammals and invertebrates.[10]

Within New Zealand's marine area fisheries management is divided into three categories under legislation: customary Māori fishing, commercial fishing and recreational fishing. Coastal

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[2] See Waitangi Tribunal *Report of the Waitangi Tribunal on the Muriwhenua Fishing Claim* (*Muriwhenua Claim*) (Wai 22, 1988); and Waitangi Tribunal *The Ngai Tahu Report* (*Ngai Tahu Report*) (Wai 27, 1991).

[3] Valmaine Toki "Adopting a Māori Property Rights Approach to Fisheries" (2010) NZJEL 197 at 200.

[4] *Muriwhenua Claim* (1998), above n 2, at [3.1.1].

[5] RP Boast "Māori Fisheries 1986—1998: A Reflection" (1999) 30 VUWLR 111 at 112.

[6] Treaty of Waitangi (Fisheries Claims) Settlement Act 1992; Fisheries (Kaimoana Customary Fishing) Regulations 1998; Fisheries (South Island Customary Fishing) Regulations 1999; and Maori Fisheries Act 2004.

[7] Ministry for the Environment *Environment New Zealand 2007* (December 2007) at 315. For an authoritative source on New Zealand's marine environment boundaries and the legal responsibilities of government agencies, see Trevor Daya-Winterbottom "Protection of the Coastal and Marine Environment" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (Thomson Reuters, 2018) at chapter 14.

[8] Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977 ss 3, 9 and 10(1). New Zealand has the exclusive right to control fishing and related activity within these areas which together comprise New Zealand's fisheries waters.

[9] New Zealand's extended continental shelf covers an area of approximately 1,7000,000 km^2, see Ministry of Foreign Affairs and Trade "Our Maritime Zones and Boundaries" at <www.mfat.govt.nz>.

[10] It is estimated that there are between 54,600 and 75,700 marine species in New Zealand's EEZ, of which only 11,202 (or 15 per cent) have been described, and the earth's oceans are thought to contain between one third and three quarters of all New Zealand's indigenous species; see further DP Gordon and Others *Biodiversity of Aotearoa New Zealand* (PloS One, 2010).

waters where the majority of customary and recreational fishing occurs is along New Zealand's 18,218km long coastline.[11] Approximately 70 per cent of commercial fishing occurs in deepwater fisheries with most caught fish being processed offshore and exported. Seafood is New Zealand's fifth largest export earner;[12] however, the seafood industry is a marginal sector in New Zealand's economy being responsible for only .03 per cent of added value.[13] New Zealand's fisheries "quota" (explained below) is valued at approximately NZD 4 billion. The estimated value of New Zealand's entire marine economy (the total annual ecosystem goods and services provided) is between NZD 403 billion and 408 billon.[14] Other values associated with the marine area such as aesthetic, and cultural (including spiritual) values cannot be quantified in monetary terms; the marine seascape is invaluable.[15]

II Privatisation of Fisheries Resources

By the early 1980s, problems with the fisheries regime had culminated in a political and environmental management failure to adequately address overfishing.[16] The Fisheries Act 1983 introduced the fishing quota system for selected deepwater species. Experience of that system in part along with the Fisheries Amendment Act 1986 led to the extension of quota management to inshore species.[17] The 1983 Act also changed criteria for commercial fishing licences, with the effect of permanently removing and excluding part-time—usually coastal—fishermen from renewing their licences and an economically driven "rationalisation" of the fishing capacity in readiness for the QMS extension to inshore fisheries.[18] Rather than taking

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[11] Ministry for the Environment *Environment New Zealand 2007* (December 2007) at 315.

[12] Seafood is New Zealand's fifth largest export earner with earnings expect to increase from approximately NZD 1.8 billion from June 2016 to over NZD 2.1 billion by June 2020 while the fishing industry employs over 26,000 people directly, or in flow-on services.

[13] Bjorn Hersoug "After All these Years: New Zealand's Quota Management System at a Cross-Roads" (2018) 92 Marine Policy, 101-110 at [8].

[14] A MacDiarmid, C Law, M Pinkerton, and J Zeldis "New Zealand Marine Ecosystem Services" in J Dymond (ed) *Ecosystem Services in New Zealand – Conditions and Trends* (Manaaki Whenua Press, 2013) at 238-253.

[15] See Waitangi Tribunal Act 1975 sch 1.

[16] See Ministry of Agriculture and Fisheries "Future Policy for the Deep-water Fishery" (discussion paper, Wellington 1982); Ministry of Agriculture and Fisheries "Inshore Finfish Fisheries – Proposed Policy for Future Management" (Wellington, 1984); and Ministry of Fisheries *Fisheries Management in a Property Rights Regime: The New Zealand Experience* (Wellington, 1996).

[17] Fisheries Act 1983, Part 2A ss 28AB – 28ZGA, and Part 2B ss 28ZH – 28ZZG, now repealed and replaced by the Fisheries Act 1996, Part 4 ss 17 – 80. The QMS was first introduced by an amendment to the Fisheries Act 1983, by inserting Part 11A (Commercial Fishing and Quota Management System) under the Fisheries Amendment Act 1986 (No. 34). Borjn Hersoug *Unfinished Business: New Zealand's Experience with Rights-based Fisheries Management* (Eubron Delft, Norway, 2002) 19-23.

[18] Licence applicants under the Fisheries Act 1983 were required to show that their annual income relied wholly or substantially (80 per cent or NZD 10,000 or more per annum) on fishing activities or that they had made or

into account customary or historical ties to fishing by these groups, including Māori, only those who held licences in the 12 months preceding the introduction of the 1986 Amendment Act were entitled to fisheries quota, quota which was then freely gifted to qualifying users.

The QMS was a revolution in the ownership, management and control of the fisheries resource.[19] It was considered that only a property rights regime (the allocation of individual, legally transferable "quota" shares in fisheries) would ensure that fisheries stocks would be sustained in perpetuity.[20] The implementation of individual transferable quota (ITQ) under the QMS marked the first attempt in New Zealand to manage natural resources through market mechanisms.[21] The 1983 Fisheries Act and the 1986 amendment were a manifestation of the wider neoliberal political agenda of the 1980s. More broadly, a "persuasive global discourse of privatisation, and contrarily, the dire consequences of open access ownership as state EEZs were conceived" a powerful local impetus behind the move to privatise fishing rights.[22] The transition of fisheries management through the privatisation of fishing rights explicitly linked environmental and economic crises and trumpeted the QMS as the new panacea:[23]

> Privatising fishing rights was considered the means through which to increase the profitability of what was deemed a hyper regulated, over capitalized, somewhat chaotic, and under developed market, particularly in terms of its export potential, and to simultaneously conserve fish stocks by allocating rights to the most 'efficient' users. Sustainability, having been popularised in international agendas, became the unifying theme.

However, despite the advantages associated with the QMS, problems remained. The environmental objectives of the 1983 Act were not clearly stated or defined. Furthermore, the

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intended to make an appreciable investment in the industry. As a result of this, approximately 1,500 – 1,800 part-time fishermen were removed, with a disproportionate impact on Māori. Notably, although this instigated a sharp reduction in the number of small boats, larger vessels more than compensated for this loss, filling the gap as small boats exited. Hence, despite the drastic restructuring of the industry, the total catch was reduced by a mere five percent; see Fiona McCormack "Sustainability in New Zealand's Quota Management System: A Convenient Story" (2017) 80 Marine Policy 35-46, at 37.

[19] Justine Munro "The Treaty of Waitangi and the Sealord Deal" (1994) 24 VUWLR 389-430 at 400. See also Boast (1999), above n 5, at 114-116.

[20] Ministry of Fisheries *Fisheries Management in a Property Rights Regime: The New Zealand Experience* (1996) at 2. Marguerite Quin "The Fisheries Act 1996: Context, Purpose and Principles" (1997) 2 AULR 8, 503 at 515.

[21] For a concise summary and explanation of the use of market mechanisms in the context of environmental policy see Cath Wallace "Environmental Justice and New Zealand's Fisheries Quota Management System" (1999) 3 NZJEL 33 at 37-38.

[22] McCormack (2017), above n 18, at 37.

[23] At 38.

Act failed to adopt an ecological approach towards management of the marine environment.[24] Formal reviews of the QMS suggested the need for a thorough reform of the whole legislative framework.[25] The resulting Fisheries Act 1996 was therefore the culmination of 10 years of experience of the QMS and five years of review and debate.[26] Among a number of changes, the 1996 Act (and subsequent amendments) reflected environmental management concerns; calls from the fisheries industry for continued management devolution; Crown concerns over the costs of administering the QMS system; integration of further non-QMS fish species into the system; and further stakeholder participation. Significantly, commercial stakeholders won important concessions concerning participation and the devolution of management responsibilities under the Act. The 1996 Act also attempted to provide for fisheries sustainability and the meeting of the Crown's Te Tiriti and international obligations.

A key presumption of the QMS however was Crown ownership of fisheries resources.[27] The implications of this presumption for Māori are discussed below.

A The Quota Management System

The QMS now under the Fisheries Act 1996 allocates individual transferrable fishing quota in an increasing number of commercial fish stocks.[28] The QMS attempts to ensure sustainable use of fisheries resources through direct control of annual harvest levels by setting an annual total allowable catch (TAC) for every fish "stock" (species of fish, shellfish or seaweed from a particular area).[29] TAC is rooted in assessments of "maximum sustainable yield" (MSY) which, in relation to any stock, means "the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the population dynamics of the

[24] Fisheries Task Force *Fisheries Legislation Review: Public Discussion Paper* (1991) at [i].

[25] See PH Pearse "Building on Progress: Fisheries Development in New Zealand" (report prepared for the Minister of Fisheries, Wellington, 1991); and Fisheries Task Force (1991) above n 24.

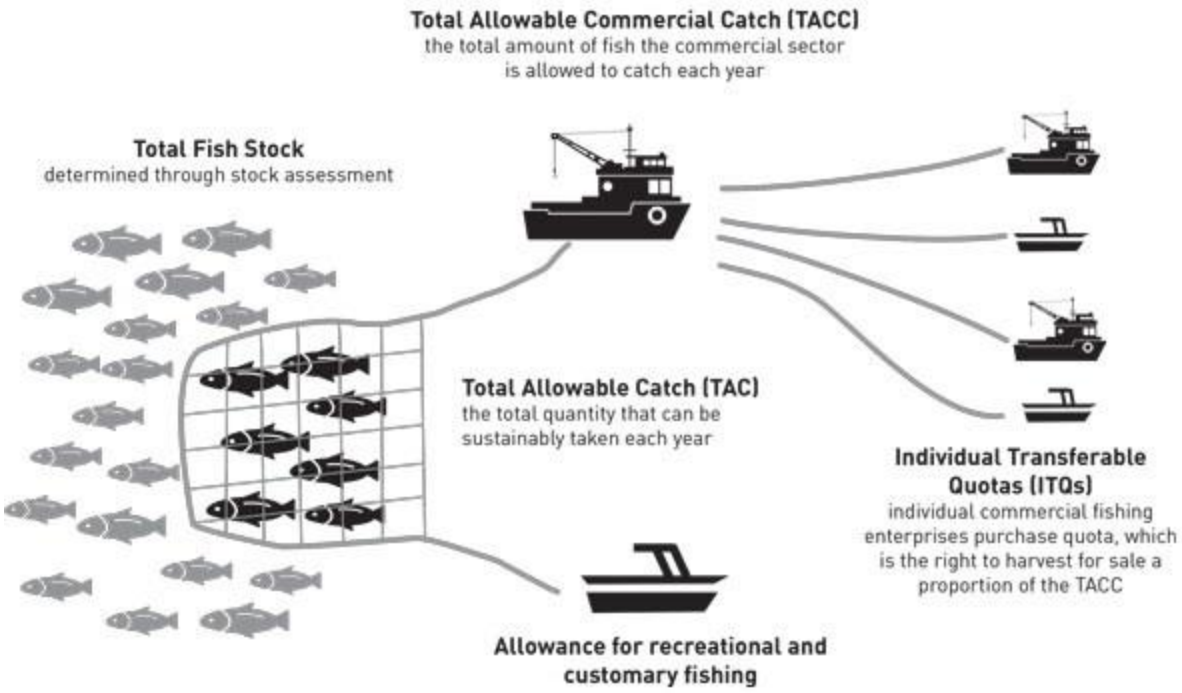
[26] Eugene Bruce Rees "In What Sense a Fisheries Problem: Negotiating Sustainable Growth in New Zealand Fisheries" (doctoral dissertation (geography), University of Auckland, November 2005) at 108.

[27] PA Memon and R Cullen "Fishery Policies and their Impact on the New Zealand Māori" (1992) 7 Marine Resource Economics 153-167 at 159.

[28] Fisheries Act 1996, Part 4, ss 17 – 80. Initially, ITQ was a transferable right to take a specified proportion of a species of fish within a defined quota management area (Fisheries Act 1996, s 27 and sch 1 part 3). Significant changes were made to the QMS in 2001 which changed the nature and role of ITQs where ITQ has become proof of ownership of access to a specified proportion of the specified commercial fish stock. The Fisheries Act 1996 came fully into force in October 2001 and has undergone numerous amendments prior, and subsequently, to that date. See *Laws of New Zealand* Fisheries (online ed) at [5].

[29] See Fisheries Act 1996 s 2(1) definition of total allowable catch; see also ss 13, 14 and 20.

stock and any environmental factors that influence the stock".[30] In order to set TAC (ie to set harvest levels at MSY), fish stocks are also separated by quota management areas which consider administrative and biological factors for the species. These levels allow for finer control over fish stocks where sustainable catch levels can be set to suit different areas. [31] The yearly TAC for each species is shared between different users of the fishery, with an allowance made for recreational and customary fishing and other fishing-related mortality. The remainder of the TAC is allocated as the total allowable commercial catch (TACC). This limits the amount of fish caught by commercial fishers.[32] The diagram below (Figure 6.1) shows how the QMS divides access to fish stocks between fishers:[33]



[30] Fisheries Act 1996 ss 2(1) and 13(2). In simple terms MSY implies that no stock may be reduced beyond the point at which it cannot be renewed: hence, a sufficient spawning biomass must be conserved to maintain the stock's capacity to reproduce. Biomass is the total weight of fish that can support harvest of the MSY.

[31] Fisheries Act 1996 ss 2 and 24 – 26. Fisheries Act 1996 s 13(1) – (2A). See <www.mpi.govt.nz/legal/legal-overviews-legislation-standards/fisheries-legislation/quota-managementsystem/>.

[32] Fisheries Act 1996 s 20. Kathryn Edmonds "Regulatory and Instrumental Structure of Environmental Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (Thompson Reuters, Wellington, 2015) at [10.9.1]. See also Hersoug (2018), above n 13, at [3].

[33] Figure sourced from B Shallard "Concepts and Practices of Individual Transferrable Quota for the Management of Fisheries: An Overview" (presentation for Ministry of Food Processing Industries Conference, New Delhi, n.d).

Quota is a share in a fish stock and the total number of shares for a fish stock is always 100,000,000.[34] Each year, a quota owner receives an annual catch entitlement (ACE), the right to catch a certain amount of fish stock during the fishing year.[35] The amount of ACE that a quota holder receives varies depending on the TACC set for that species for that year. On the first day of each fishing year ITQ spawns tradeable catching rights for the new fishing year in ACE. When fishers do not have enough ACE to cover their catch, they must either buy more or pay a penalty for exceeding their catch allowance.[36] Both fishing quota and ACE can be bought, sold and leased. [37]

Quota in fisheries is a right in perpetuity and over time, many of the rights associated with quota have been imbued with characteristics resembling private property. The four common characteristics used to determine the quality of quota right were: exclusivity, security, duration and transferability.[38] Private property in quota theoretically facilitates the purposes of the Act in two ways: by creating an incentive for fishers to adopt sustainable fishing practices, as to do otherwise is harmful to their stake holding; and by regulating catch so that fishers do not race against each other to catch a limited amount in the shortest time possible. Instead, catch can be allocated over a full year.[39]

Fisheries NZ sets quota management area boundaries including fishing methods and fishing seasons for any stock, area, fishing method or fishing vessel within which fish may be harvested.[40] Fisheries Plans can set strategies and rules for the management of fish stocks or fisheries in an area; these may relate to one or more stock, fishing years or areas and may

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[34] Fisheries Act 1996 s 42.

[35] Fisheries Act 1996 s 2(1) annual catch entitlement.

[36] Fisheries Act 1996 s 75.

[37] One of the consequences of the QMS is that more money is made through trading ACE than catching fish; see Fiona McCormack "New Zealand's Quota Management System on an Undeserved Pedestal" *The Conversation* (NZ, online) (5 September 2017).

[38] David Grinlinton "Evolution, Adaption, and Invention: Property Rights in Natural Resources in a Changing World" in David Grinlinton and Prue Taylor (eds) *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (Martinus Nijoff Publishers, Netherlands, 2011); Randal Bess "What's the Catch? The State of Recreational Fisheries Management in New Zealand" (The New Zealand Initiative, 2016) at 17. See also R Connor "Are ITQs property rights? Definition, discipline and Discourse" in R Shotton (ed) *Use of Property Rights in Fisheries Management* (technical paper Food and Agriculture Organization of the United Nations, Rome, 2000) at 29-38.

[39] Jordan Boyd "Fishing for the Big Boys: Competing interests under the Fisheries Act 1996" (2010) 41 VUWLR 761 at 768.

[40] Fisheries Act 1996 s 11(3) – (5).

include management objectives to support the purpose of the Act.[41] Fisheries NZ may also set or vary "sustainability measures" for fisheries management which can include the TAC and TACC for QMS stock or any fish stock.[42] Fishing permits issued under the Act for the taking of fish stocks that are subject to the QMS are subject to permit conditions relating to and restricting fishing areas, methods, equipment and locations where fish may be landed and periods of time within which a permit holder may use a permit.[43] Permit conditions may be amended, added to or revoked at any time through written notice, and failure to comply with permit conditions is an offence under the Act.[44] A coordinated management regime extends through all aspects of commercial fishing within New Zealand's fisheries waters from the taking of the fish through to its eventual sale or export.[45] This regime enables an audit trail to check compliance with the QMS.[46]

Most importantly for the purpose of this chapter, fisheries management and the QMS are information-hungry. In order to maximise the potential of resources, sound science is required and the accurate assessment of fish stocks is a critical ingredient for successful fisheries.[47] Fish stock assessments rely on accurate reporting of commercial permit-holder fishing activities, and on additional scientific research regarding fisheries and biodiversity health. The duty of FNZ is to ensure fish stocks within the QMS are sustainably utilised by allocating and adjusting catch quota under ITQs and by monitoring and enforcing permit-holder compliance.[48] Significant and substantial reporting requirements relating to permit-holder fishing activity apply under the Act and regulations. A fishing permit can be revoked and immediately cancelled for false or misleading information supplied under reporting requirements.[49]

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[41] Fisheries Act 1996 s 11A. Edmonds (2015), above n 32, at [10.9.1]. See also see Kelly Lock and Stefan Leslie *New Zealand's Quota Management System: A History of the First 20 Years* (Motu Working paper 07-02, Motu and Ministry of Fisheries, Wellington, 2007) at [8.2.2].

[42] Fisheries Act 1996 s 11(1).

[43] Fisheries Act 1996 ss 91 and 92 subs (1)(a)(i), (1A), and (3).

[44] Fisheries Act 1996 s 92 subs (2) and (6).

[45] See *Laws of New Zealand* Fisheries (online ed) at [6].

[46] See for example, the Fisheries Act 1996 Part 10 ss 187 – 195, Fisheries (Recordkeeping) Regulations 1990, as amended by Fisheries (Recordkeeping) Amendment Regulations 2004; and Fisheries (Reporting) Regulations 2017.

[47] Rees (2005), above n 26, at 91.

[48] Fisheries Act 1996 Part 4. For historical accounts of New Zealand commercial fisheries management see Hersoug (2002), above n 13; and Lock and Leslie (2007), above n 41.

[49] Fisheries Act 1996 ss 96(1)(a) and 305(A)(1)(a).

B Māori Fisheries Rights

Article II of Te Tiriti guaranteed to Māori full, exclusive and undisturbed possession of their fisheries so long as Māori desired.[50] However, 120 years of government fisheries legislation, from 1866 – 1986, failed to guarantee, provide for, or protect Māori fisheries rights.[51] General fishing laws did not recognise the Māori right to participate in the control and management of their fisheries: Māori perspectives were never incorporated, and no effort was ever made to consult with Māori before legislating.[52] While Māori fishing rights were "saved" from the operation of general fisheries legislation, the Māori fishing rights savings provision was given no substance by the courts until 1986; the only fishing rights were those given by Parliament.[53]

The privatisation of fisheries resources with the introduction of the QMS under the Fisheries Amendment Act 1986 had important and lasting consequences for Māori.[54] The implementation of the QMS was erroneously based on the assumption that Māori had no proprietary right to fisheries and that the ownership of the resource resided entirely with the Crown and was therefore the Crown's to distribute.[55] As guaranteed by Te Tiriti, Māori fisheries rights are based on custom.[56] The potential loss of Māori customary fishing rights through privatisation of rights to fish under the QMS—and subsequent litigation of this decision by Māori—therefore compelled the Crown to negotiate with Māori regarding the settlement of claims in their fisheries.[57] Although all Māori fisheries rights are based on

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[50] Treaty of Waitangi Act 1975 sch 1.

[51] New Zealand Law Commission *The Treaty of Waitangi and Maori Fisheries – Mataitai Nga Tikanga Maori me o Tiriti of Waitangi* (Wellington 1989).

[52] *Ngai Tahu Report* (1991), above n 2, at 295. See also Anne-Marie Jackson "Erosion of Māori Fishing Rights in Customary Fisheries Management" (2013) 21 WLR 59 at 63-67.

[53] For example, the "saving provisions" of the Fish Protection Act 1877 s 7; Sea Fisheries Amendment Act 1903 s 14; Fisheries Act 1908 s 77(2); and Fisheries Act 1983 s 88(2). In *Te Weehi v Regional Fisheries Officer* [1986] 1 NZLR 680 (HC) the High Court allowed Māori exercising traditional subsistence rights a defence against general fisheries laws. The full implications of the case were not fully realised when the Fisheries Amendment Act 1986 (which introduced the quota management system) was enacted.

[54] See Parliamentary Commissioner for the Environment *Setting Course for a Sustainable Future: The Management of New Zealand's Marine Environment* (1999) at [3.8.3].

[55] *Ngai Tahu Report* (1991), above n 2, at 133.

[56] Findings on the nature and extent of Māori fisheries rights have been made by the Court of Appeal, see *Te Waka Hi Ika o Te Arawa v Treaty of Waitangi Fisheries Commission* [2000] 1 NZLR 285 (CA). The Waitangi Tribunal has also produced two major fisheries reports supporting Māori customary rights in fisheries: Waitangi Tribunal *Muriwhenua Report* (1988), and Waitangi Tribunal *The Ngai Tahu Report* (1991), above n 2. See also Waitangi Tribunal Report *The Fisheries Settlement Report* (Wai 307, 1992).

[57] *Te Runanga o Muriwhenua Inc v Attorney-General* [1990] 2 NZLR 641 (CA). See Boast (1999), above n 5, for a summary of Treaty Settlement negotiations, case law and legislative process for Fisheries Settlement and customary fishing. See also Munro (1994), above n 19, at 403.

customary rights, the negotiations led to a two-stage Treaty Settlement of claims over Māori customary and commercial fisheries rights[58] because Māori customary fishing rights were found to include a commercial component and because such rights were capable of evolving as recognised commercial fishing rights.[59] The Treaty Settlement of Māori fisheries rights offered by the Crown artificially separated Māori customary rights in their fisheries into two categories: commercial fishing rights and customary fishing rights. The sale of customary fisheries catch is now prohibited under legislation and regulations and no pecuniary interests may be attached to customary Māori fishing rights.[60]

Māori commercial fishing rights have been incorporated into the QMS in both the general legislation of the Fisheries Act 1996 and under specific Treaty Settlement legislation and customary fishing regulations. These comprise: [61]

- the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992;
- the Fisheries Act 1996;[62]
- the Fisheries (South Island Customary Fishing) Regulations 1999;
- the Fisheries (Kaimoana Customary Fishing) Regulations 1998; and
- the Fisheries (Amateur Fishing) Regulations 2013.

Commercial fishing activity under Māori-owned ITQ holdings is subject to the provisions of the Fisheries Act 1996 and related regulations in the same way as for non-Māori ITQ holders. Therefore, later discussion of commercial permit-holder information reporting requirements has equal application to commercial fishing activity under Māori-owned ITQ holdings. Two sets of customary regulations were negotiated under fisheries Treaty Settlement: the Fisheries

[58] *Laws of New Zealand* Fisheries (online ed) at [143].

[59] *Ngai Tahu Māori Trust Board & Ors v Director General of Conservation & Ors* [1995] 3 NZLR 553 (CA). See also *Muriwhenua Claim*, above n 1, at 234–239; and Stephanie Milroy "The Fisheries Reports" in Janine Hayward and Nicola Wheen (eds) *The Waitangi Tribunal: Te Roopu Whakamana i te Tiriti o Waitangi* (Bridget Williams Books, 2004) at 86.

[60] Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 s 10(c).

[61] Fisheries (Amateur Fishing) Regulations 2013 art 52. Note the 2013 regulations replaced a provision for customary fishing activity under the Fisheries (Amateur Fishing) Regulations 1986 art 27A (repealed). Further, the Māori Fisheries Act 2004 does not codify Māori fishing rights, rather its purpose (s 3) in addition to implementing the agreements made in the Deed of Settlement 1992, is to benefit all Māori through the development of collective and individual interests of iwi in fishing. Other Treaty Settlement legislation relating to Māori fishing rights in the marine environment includes the Ngai Tahu Claims Settlement Act 1998, and the Māori Commercial Aquaculture Claims Settlement Act 2004. For further, see *Laws of New Zealand* Fisheries (online ed).

[62] Fisheries Act 1996 ss 174 – 186B.

(South Island Customary Fishing) Regulations 1999, which pertain to the South Island; and the Fisheries (Kaimoana Customary Fishing) Regulations 1998, which pertain to the North Island.

Currently, Māori may only manifest customary fishing rights under legislation and regulation and it is incumbent on Māori to prove their rights via legislative processes.[63] Such rights, unlike rights expressed in ITQ holdings, are not transferrable or alienable, nor is there any direct economic value in customary rights holding for Māori. The Minister of Oceans and Fisheries is required to make allowances for customary harvest when allocating the TAC.[64] Customary, commercial and recreational fishing are considered simultaneously when TACC levels are set and customary rights are considered to take priority because of the obligations set out in Te Tiriti o Waitangi.[65] In examining the statutory and regulatory information requirements pertaining to Māori fishing rights, this chapter focuses on legal information provisions for Māori customary (rather than commercial) fishing. Before turning to these and the central provisions of the Fisheries Act 1996 however, central information challenges in marine fisheries management which this chapter seeks to understand are summarised.

C Fisheries Information Challenges

Due to the higher concentration of academic material on marine fisheries management, many information-related challenges in fisheries management have already been identified by others. These include:[66]

- a relative lack of information on the environmental effects of commercial fishing activity;
- failure of self-monitoring by commercial fisheries permit holders demonstrated by ongoing non-reporting and misreporting of fishing activity by permit holders;

[63] Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 s 10(d); Fisheries (South Island Customary Fishing) Regulations 1999; Fisheries (Kaimoana Customary Fishing) Regulations 1998; and Marine and Coastal Area (Takutai Moana) Act 2011 ss 6, 7, and ss 46 – 62. It is argued that the separation of commercial and customary fishing rights under the Treaty settlement legislation is an artificial separation; see Robert Joseph "Unsettling Treaty Settlements" in Nicola Wheen and Janine Hayward (eds) *Treaty of Waitangi Settlements* (Bridget Williams Books, 2012) at 153; and Margaret Mutu "The Sea I Never Gave" in Nicola Wheen and Janine Hayward (eds) *Treaty of Waitangi Settlements* (Bridget Williams Books, 2012) 114-123. See also Waitangi Tribunal *The Fisheries Settlement Report* (1992), above n 56; and Milroy (2004), above n 59.

[64] Fisheries Act 1996 s 21(1).

[65] However, the priority ranking between recreational and commercial fishing is not so clear, see Lock and Leslie (2007), above n 41, at [5.2].

[66] For these and other challenges see Parliamentary Commissioner for the Environment and Controller and Auditor-General *Marine Fisheries Management* (December 1990); and Parliamentary Commissioner for the Environment (1999), above n 54.

- the high level of involvement by commercial fisheries stakeholders in fisheries regulatory and administrative services and fisheries research processes; and
- the limited effectiveness (particularly for North Island Māori) regarding the majority of legal provisions for customary fishing activity, including the legal processes to set up, administer and report on their customary fishing activity.

While all of these information-related challenges stem from the legal regime itself (the regime for all fisheries users), the effectiveness of the regime's implementation continues to be affected by the political and economic ideology that created it, ie: the neoliberal policy of the 1980s and 1990s; the reductionist and narrow view of fisheries "resources" and "fish stocks" and the heavy reliance on market mechanisms to problem solve; the inequities in Te Tiriti Settlement negotiations between the Crown and Māori; and regarding recreational fisheries, the entrenchment of an "everyone's birth right" attitude to fisheries access, with few corresponding responsibilities.

III Fisheries Act 1996

The purpose of the Act is "to provide for the utilisation of fisheries resources while ensuring resource sustainability".[67] Ensuring sustainability is defined as maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations and avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment.[68] Utilisation means "conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural well-being".[69] The statutory purpose is to ensure that both the competing policies of utilisation of fisheries and sustainability are accommodated as far as is practicable in the administration of fisheries, while recognising the inherent unlikelihood of both policies' being accommodated in full. Thus, although fisheries are to be utilised, sustainability is to be ensured.[70]

Once set, the TAC for each fish stock is set until varied.[71] Sections 13(2) and (3) are key:

> (2) The Minister shall set a total allowable catch that—

[67] Fisheries Act 1996 s 8. For further information on the reform leading up to the Fisheries Act 1996 and a discussion of "utilisation" and "management" of natural resources see Quin (1997), above n 20, at 503.

[68] Fisheries Act 1996 s 8(2)(a) and (b).

[69] Fisheries Act 1996 s 8(2)(b);

[70] *New Zealand Recreational Fishing Council Inc v Sanford Ltd* (*Sanford Ltd*) [2009] NZSC 54, [2009] 3 NZLR 438 at [39] per McGrath J.

[71] Fisheries Act 1996 s 13(1).

(a) maintains the stock at or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks; or

(b) enables the level of any stock whose current level is below that which can produce the maximum sustainable yield to be altered—

(i) in a way and at a rate that will result in the stock being restored to or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks; and

(ii) within a period appropriate to the stock, having regard to the biological characteristics of the stock and any environmental conditions affecting the stock; or

(c) enables the level of any stock whose current level is above that which can produce the maximum sustainable yield to be altered in a way and at a rate that will result in the stock moving towards or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks

[…]

(3) In considering the way in which and rate at which a stock is moved towards or above a level that can produce maximum sustainable yield under subsection (2)(b) or (c), […], the Minister shall have regard to such social, cultural, and economic factors as he or she considers relevant.

As shown, the TACC is an allocation which comes from the overall TAC; once set, it remains in effect until varied[72]. In setting the TACC, regard must be paid to the TAC and allowances for non-commercial fishing interests in stock. These are Māori customary non-commercial fishing interests, recreational interests, and all other mortality to that stock caused by fishing.[73] After the TACC is set, it is divided between commercial fishers who hold ITQs in those fish stocks. The TAC is driven by the requirement to move towards or above MSY.[74]

The science underpinning the MSY concept is important because MSY findings are the foundation of TAC assessments. Where a fishery exists in an unfished state, its biomass is 100 per cent, a level known as the carrying capacity of the environment. The "yield" of the fishery will be zero. At a biomass of less than 100 per cent, a fishery will grow back towards its carrying capacity. At a lower biomass, a fishery will grow more quickly as the fish are generally

[72] Fisheries Act 1996 s 20(1).

[73] Fisheries Act 1996 s 21(1)(a) and (b).

[74] *Sanford Ltd*, above n 70, at [43].

younger, have less competition and grow more rapidly. This harvestable growth is the yield.[75] Ascertaining the biological characteristics of fish stocks is the work of scientists who use trawler and catch surveys, acoustics, tagging, and more commonly, modelling and simulations. This data is then incorporated into the stock assessment model framework. The knowledge which informs the Minister's yearly TAC-setting arises from plenary reports produced from Science Working Groups. These reports detail:[76]

- biological and stock data;
- quantitative information regarding the total harvest of commercial;
- recreational and Māori customary catch; and
- environmental effects of fishing and risk assessment.

This is a mixture of permit holder supplied and procured and FNZ procured information and data.

A Environmental Principles

Environmental principles "shall be taken into account".[77] Doing so requires: maintaining the long-term viability and biological diversity of fish stocks; maintaining biological diversity of the aquatic environment to be maintained; and protecting habitat of particular significance to fisheries management.[78] Biological diversity means "the variability among living organisms, including diversity within species, between species, and of ecosystems".[79] The aquatic environment is defined as the natural and biological resources comprising any aquatic ecosystem. It includes all aquatic life and the oceans, seas, coastal areas, inter-tidal areas, estuaries, rivers, lakes and other places where aquatic life exists.[80]

The Act's environmental principles appear to have played a significant role in the formulation and operation of the Act's information principles. The lack of explicit information requirements for the regulator (FNZ) regarding the carrying out of fisheries research are

[75] Boyd (2010), above n 39, at 766.

[76] McCormack (2017), above n 18, at 38-39.

[77] Fisheries Act 1996 s 9.

[78] Fisheries Act 1996 s 9. These environmental principles come from New Zealand's international obligations under the United Nations Convention on the Law of the Sea (UNCLOS) (1982) 1833 UNTS 3, 397; 21 ILM 1261; and the Convention on Biological Diversity (1992) 1760 UNTS 79, 143; 31 ILM 818.

[79] Fisheries Act 1996 s 2(1).

[80] Fisheries Act 1996 s 2(1). Note s 2 also defines aquatic ecosystem, aquatic life, and associated or dependent species.

particularly relevant for this study. Final advice from the Primary Production Committee on the Fisheries Bill (1996) (the Report) included commentary about the proposed environmental principles and reasoning for the lack of FNZ information requirements in light of the Act's purpose:[81]

> [The Act's] intention is to facilitate the activity of fishing while having regard to the sustainability of harvests and mitigating the effects of fishing on the environment. Therefore, it deals with fisheries resources that can be harvested […]. It does not deal with all aspects of the management of the aquatic environment, such as the protection of marine species and habitats, which is provided for through various statutes dealing with environmental management. To achieve the Bill's purpose, environmental principles, information principles and environmental standards are provided in Parts I and II. Principally these Parts deal with catch limits and other controls that restrain fishing activity. The nature of the environmental principles is such that a *value judgment will be made* about the extent to which they are necessary to achieve the purpose of the Act. In these circumstances, 'recognise and provide for' places too strong an obligation on persons exercising functions under the Act, *possibly forcing them to undertake vast amounts of research to meet the obligation.* The words 'take into account' provide more appropriate discretion for the decision-maker […].

Rather than seeking to temper the above position (for example, by recommending linked and explicit research and information requirements under the Conservation Act 1987 and RMA 1991 in regard to land and coastal management informational duties), the legislators decided instead to place *no* explicit or mandatory obligation on those exercising functions under the Fishers Act to conduct fisheries-related research.[82] Additionally, the wide discretion made available in the environmental principle value judgement leaves ample room for politically and ideologically influenced interpretation of sustainability. The Report responded to submissions on the environmental protection principles with the advice that:[83]

> We do not support the inclusion of such principles within the environmental principles clause. These [protective] values are provided for explicitly in other legislation[84] […]. Their inclusion into the environmental principles would introduce a range of *non-utilisation values* into the [Act] and significantly undermine the interface with other statutes.

[81] The Primary Production Committee Report on the Fisheries Bill (1996) at [viii]. Emphasis added.

[82] This may be compared to RMA 1991 s 35 discussed in chapter three.

[83] Primary Production Committee Report on the Fisheries Bill (1996) at [viii]. For a recent, authoritative judgment on how the Fisheries Act 1996 and RMA 1991 share responsibilities for environmental protection and fisheries utilisation, see *Attorney-General v The Trustees of the Motiti Rohe Moana Trust* [2019] NZCA 532.

[84] The Report refers to the RMA 1991, Marine Reserves Act 1971, Marine Mammals Protection Act 1978, and the Wildlife Act 1953.

While this advice was followed, its effect is negatively compounded within the operational matrix of the Fisheries Act and the overall suite of marine-related legislation and its effective coordination.[85] Furthermore, although the dual purpose of the Act is "utilisation while ensuring sustainability", in practice, greater emphasis is placed on extractive values. For example, the wording of the environmental principle[86], "biological diversity of the aquatic environment" is repeated only once within the Act's 370 provisions.[87] Biological diversity is otherwise only referred to in the Act regarding the biological diversity of fish stocks.

Part 3 of the Act contains provisions relating to "sustainability measures" where the Minister "may have regard to" the need to commission appropriate research about decision-making affecting fisheries stock or the need to implement measures to improve the quality of information about fisheries stock.[88] The Minister may also require or authorise information relating to fishing-related mortality of marine mammals from persons required to keep records of fishing-related activity under the Act.[89] Part 3 contains no provisions relating to research regarding "maintaining the biological diversity of the aquatic environment" however.

B Information Principles

The Act's information principles acknowledge the role information plays in maintaining sustainable and optimally utilised fisheries. However, the role of science information (including its quantity and quality) in fisheries decision-making is limited, as shown by judicial interpretation and the other examples shown below. The information principles[90] require:

> All persons exercising or performing functions, duties, or powers under this Act, in relation to the utilisation of fisheries resources or ensuring sustainability, shall take into account the following information principles:
>
> (a) decisions should be based on the best available information;

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[85] See discussion in Greg Severinsen, Raewyn Peart and Bella Rollinson (*Breaking Wave*) *The Breaking Wave: A Conversation about Reforming the Oceans Management System in Aotearoa New Zealand* (Environmental Defence Society, August 2021).

[86] Fisheries Act 1996 s 9(c).

[87] Fisheries Act 1996 s 26(d) cost recovery principle.

[88] Fisheries Act 1996 s 14A(4)(a) and (b).

[89] Fisheries Act 1996 ss 15(3) and 189.

[90] Fisheries Act 1996 s 10. For commentary on the extent of s 10 precautionary approach used in decisions affecting fisheries sustainability see Nicola Wheen "How the Law Lets Down the 'Down-Under Dolphin' – Fishing-Related Mortality of Marine Animals and the Law in New Zealand" (2012) NZJEL 477 at 492; and Dara Modeste "The Precautionary Principle and the Fisheries Act (2011) NZJEL 179.

(b) decision makers should consider any uncertainty in the information available in any case;

(c) decision makers should be cautious when information is uncertain, unreliable, or inadequate; [and]

(d) the absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act.

*T*he Act defines "information" as including scientific, customary Māori, social or economic information and any analysis of any such information.[91] Best available information (a) means "the best information that, in the particular circumstances, is available without unreasonable cost, effort, or time".[92] The information principles aim to ensure decision-making fulfils the purpose of the Act—usually, either regarding TAC-setting or other "sustainability measures".[93] An obvious challenge for the Minister is that decisions under the Act must be made with imperfect information. Information is both physically difficult and expensive to collect and the resulting data is inherently uncertain.[94]

The High Court in *New Zealand Federation of Commercial Fishing Inc v Minister of Fisheries* discussed the information principles and contrary to the applicants' view found that the Minister had a mandatory obligation to obtain the best available information.[95] It further found that the statutory wording "take into account" and "should" [96] was intended to achieve a balance. As with the environmental principles, the decision-maker retains a discretion "but is directed as to his or her responsibility".[97] The Court held that a Minister is not in error if the Minister is aware of the availability of additional information but does not obtain it before making his or her decision.[98] However, a Minister must be "accurately informed" of what

[91] Fisheries Act 1996 s 2(1).

[92] Fisheries Act 1996 s 2(1). Note, the best scientific information concept received international status and recognition in the Agreement for the Implementation of the Provisions of the UNCLOS (1982), see above n 78, relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UN Fish Stocks Agreement) (1995, 2001) arts 5 and 6.

[93] Fisheries Act 1996 ss 11(3)(b) – (e), and 11A.

[94] Boyd (2010), above n 39, at 764.

[95] *New Zealand Federation of Commercial Fishermen Inc v Ministry of Fisheries* (*NZFCI*) HC Wellington CIV-2008-485-2016, 23 February 2010.

[96] Fisheries Act 1996 s 10(1) and (1)(a).

[97] *NZCFI*, above n 95, at [29] – [39] per Mallon J.

[98] At [38].

information is available before making a decision and at what cost and in what timeframe information is available.[99] The court elaborated:[100]

> This does not mean that the Minister can only act when the best possible information is available […] Best available information means only that which, in the particular circumstances, is available without unreasonable cost, effort and time. There may be different but reasonable views about what meets that standard in any particular circumstance and the Minister is permitted this latitude by the statutory wording. Nor does taking into account that decisions should be based on the best available information mean that the Minister can only act when the information is certain and reliable.

Section 10(d) adopts the precautionary principle which as seen in earlier chapters is commonly used as a basis for resource management decision-making where there is uncertainty regarding future environmental effects of resource use.[101] Broadly, the precautionary principle means that where there is uncertainty in a fisheries management decision, this uncertainty should not be used as a reason for inaction to prevent harm. Furthermore, attempts should be made to resolve the scientific uncertainty.[102] Suggestions for legislative amendment to the Act's information principles have failed to gain political support.[103] Those in favour of an amendment to s 10 find that subs (a) "decisions should be based on the best available information" is given the most attention of the subsections and that this is to the detriment of the environmental precautionary principle in subs (d).[104]

Section 10 information principles have been the subject of numerous appeals in the courts regarding Ministry decisions affecting commercial fishing, marine conservation and species sustainability.[105] Judicial review of the Ministry's interpretation of s 10 decisions has almost

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[99] At [29] – [39]

[100] At [40] – [41].

[101] See chapter three for background on the precautionary principle.

[102] See Alexander Gillespie "Precautionary New Zealand" (2011) 24 NZULR 364-385 at 366.

[103] Fisheries Act 1996 Amendment Bill (2007) (No. 109—1) cl 4.

[104] Wheen (2012), above n 90, at 496.

[105] *Squid Fisheries Management Company Ltd v Minister of Fisheries* (*Squid Fisheries*) HC and CA 2004; *Northern Inshore Fisheries Ltd v Minister of Fisheries* HC Wellington (*Northern Inshore*) CP235/01, 4 March 2002; *Anton's Trawling Co Ltd v Minister of Fisheries* (*Anton's Trawling Co Ltd*) HC Wellington CIV-2007-485-2199 (22 February 2008), and NZCA [2007] 512; *Sandford Ltd v NZ Recreational Fishing Council Inc* [2008] NZCA 160; *Sanford Ltd*, above n 70; and *NZFCI*, above n 95. Note an exception concerning best available information in *Royal Forest and Bird Protection Society of New Zealand Inc v Minister of Fisheries* [2021] NZHC 1427 at [143] – [157], discussed further below.

wholly resulted in Ministerial decisions favouring precaution being struck down by the courts.[106]

While the Act's environmental principles are important to help provide environmental bottom lines—and particularly necessary within the precautionary context—there is no substantive requirement for the Minister to enforce environmental principles. The broad discretion for the Minister to "take into account" the environmental principles, coupled with the weak interpretation of the precautionary principle as part of the information principles, means that there is no preference within the Act regarding whether to "avoid, remedy, or mitigate" adverse effects on the aquatic environment.[107] Precaution under the Act has focused not so much on risk management within prior agreed parameters but on what to do with conflicting cases of scientific information uncertainty. Moreover, although precautionary measures are possible, courts have consistently stated that the evidence upon which these measures are based must be reliable.[108] If precautionary measures are adopted, they can provide the basis for certain action such as adaptive management. The Act does not explicitly refer to adaptive management. However, in situations where the precautionary principle on its own would necessitate a ban on certain activity, adaptive management might function to decrease levels of uncertainty over time.[109] Nevertheless, ongoing scientific studies must be undertaken to resolve the full extent of the environmental risks within a reasonable period.[110]

Two important observations can be made from case law interpretations of the Act's information principles. First, challenges to the Minister's use of best available information can be made on a broad basis, reflecting the broad definition given to information and the provisos of subs (b) and (c) above. For example, a Ministerial decision to protect an endangered mammal species was set aside by the High Court where best available information included the economic effects of the decision on commercial fishers because the information used by the Minister on economic effects was out-of-date.[111] The Court of Appeal set aside another Ministerial decision

[106] Modeste (2011), above n 90.

[107] Fisheries Act 1996 s 8 (2)(b).

[108] Gillespie (2011), above n 102, at 385. Gillespie also discusses the various levels of acceptable risk before precautionary measures are taken under various environmental Act in New Zealand, and liberal and conservative approaches to the interpretation of precaution.

[109] William Hulme-Moir "Adaptive Management and the Fisheries Act 1996" (2017) 21 NZJEL 229 at 257-258.

[110] Gillespie (2011), above n 102, at 385.

[111] *Northern Inshore*, above n 105, at [42] – [68].

where it found that it did not accord with best available information because it was based on an established scientific formula rather than on a newer, less-tested formula which the appealing parties considered to be the best available information. [112] The broad definition given to information, the broad considerations of s 13(3) and the definition of best available information under the Act, coupled with a weak interpretation of the precautionary approach in decision-making, asks more of science-based information than if decisions were made based solely on science information.[113]

Secondly, no parliamentary Minister faces more litigation, legal challenges or development of jurisprudence around their portfolio than the Minister of Fisheries.[114] This occurs for a number of reasons; however, foremostly, case law shows a Minister's decisions are challenged because they affect the financial interests of the commercial fishing industry.[115] In *New Zealand Fishing Industry Assn Inc v Minister of Fisheries*, the Court of Appeal considered a Ministerial decision to reduce the aggregate volume of commercial catch of a fish species over a given period on sustainability grounds.[116] Parties appealing the decision argued that the decision failed to have "proper respect for the proprietary rights of those holding [fishing] quota".[117] In response, the Court stated:[118]

> While quota are undoubtedly a species of property and a valuable one at that, the rights inherent in that property are not absolute. They are subject to the provisions of the legislation establishing them. That legislation contains the capacity for quota to be reduced. If such reduction is otherwise lawfully made, the fact that quota are a "property right", to use the appellants' expression, cannot save them from reduction. That would be to deny an incident integral to the property concerned. There is no doctrine of which we are aware which says you can have the benefit of the advantages inherent in a species of property but do not have to accept the disadvantages similarly inherent.

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[112] *Squid Fisheries*, above n 105.

[113] David Grinlinton "Sustainability in New Zealand Law and Policy" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (Thompson Reuters, Wellington, 2015) at [4.4.3] states that a limited form of the precautionary approach to fisheries management is imported into Fisheries Act information principles. For a discussion of precaution in environmental resources management and its incorporation in resource management statutes and application see Catherine J Iorns Magallanes and Greg Severinsen "Diving in the Deep End: Precaution and Seabed Mining in New Zealand's Exclusive Economic Zone" (2015) NZJPIL 13 at 201.

[114] Wheen (2012), above n 90, at 491.

[115] Bess (2016) above n 38, at 15, suggests that a reason fisheries management is tricky compared to other natural resources such as forestry and mining is that these developed with the support of rights and duties, which generally eliminated open access to resources.

[116] *New Zealand Fishing Industry Association (Inc) v Minister of Fisheries* CA82/97 (22 July 1997).

[117] At 15 – 16.

[118] At 16.

The entrenched sense of proprietary entitlement requiring this response from the Court arguably remains undiminished where fishing quota holders have continually strong industry representation and influence in fisheries management. The Court's statement also resonates with natural resource management tensions generally whereby resource users may actively influence policy decision-making and regulatory measures by seeking to emphasise their rights at the expense of their legal responsibilities and/or their rights as having priority over others' rights.

In an attempt to clarify the application of the Act's information principles in the setting of TACC, s 13(2A) was added by amendment:[119]

> For the purposes of setting a total allowable catch under this section, if the Minister considers that the current level of the stock or the level of the stock that can produce the maximum sustainable yield is not able to be estimated reliably using the best available information, the Minister must—
>
> (a) not use the absence of, or any uncertainty in, that information as a reason for postponing or failing to set a total allowable catch for the stock; and
>
> (b) have regard to the interdependence of stocks, the biological characteristics of the stock, and any environmental conditions affecting the stock; and
>
> (c) set a total allowable catch—
>
> (i) using the best available information; and
> (ii) that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

However, s 13(2A)(a) means that a Minister may set a quota even when information regarding the health of the fish stock is not available. Without any evidence as to sustainability, the Minister can increase TAC. This provision undermines the principles which aspire to an ecosystem-based and precautionary approach. Section 13(2A) also creates undesirable incentives for research. The fact that commercial fishers do not have to demonstrate the sustainability of their fishing creates an incentive to do the least research possible. The reduction in informational requirements may also lead to an increase in ascertaining stocks simply by reference to catch effort, because if effort remains constant, a declining fishery will produce reduced yields. However, this reference point is not always representative because

[119] Fisheries Act 1996 s 13(2A) was added following *Anton's Trawling Co Ltd*, above n 105. See further, Boyd (2010), above n 39, at 768-771.

fishing is generally targeted at dense aggregations of fish and so the normal indicators of stock depletion such as gradually declining fish rates are not reliable in these fisheries. Often, catch rates continue at high levels even though the stock biomass is being depleted. More broadly, where a fishery is targeted at producing MSY, customary, recreational and environmental interests are disadvantaged.

Commercial fishing quota was originally allocated only on limited historical fishing catch records. Unlike a resource consent under the RMA or Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 for example, commercial fisheries users were not required to provide information about the environmental effects of their fishing activity prior to being allocated quota rights; selective catch history was the only requirement. Compared to processes to acquire rights to exploit other renewable resources, this requirement can be considered a low bar to jump for a right in perpetuity to quota in wild fisheries stocks.

C Adaptive Management

As noted in chapter three, adaptive management operates within a broader picture of ecosystems-based management. Adaptive management as it is generally applied under the RMA has not been applied under the Fisheries Act.[120] While adaptive management plans (AMPs) for fisheries were used for approximately 15 years until the mid-2000s, they were eventually abandoned. First introduced in 1991 and reconfigured in 2000s, the AMP was a basis for varying the TACC levels of fish stocks for which the Ministry had limited information. The programme was developed to ensure that "in taking decisions where information was limited, the Minister did not breach statutory obligations to ensure stock sustainability".[121] The AMP was primarily about "providing the fishing industry with an opportunity to develop a fisheries stock".[122] This was to be achieved by:[123]

> [D]efining the period for the TACC increase and providing rigorous reporting requirements and stock assessment, monitoring and decision rule criteria, which [were] regularly evaluated. Meanwhile, the AMP [would provide] additional monitoring and analyses to improve the assessment of stock status and estimates of sustainable yield for those fishstocks.

[120] Hulme-Moir (2017), above n 109, at 229.

[121] Fisheries New Zealand *Review of Sustainability Measures and Other Management Controls for the 2004-05 Fishing Year Adaptive Management Programme* (Final Advice Paper, August 2004) at 25.

[122] At 26.

[123] At 25.

In 2017, on enquiry to FNZ regarding adaptive management under the Fisheries Act, the Principal Advisor for fisheries science and lead scientist for marine science at FNZ clarified that the AMPs were "abandoned several years ago" and that they were:[124]

> [E]ssentially unworkable and, in my view, [were] not really what one would usually call an adaptive management approach. Basically, [AMPs] increased TACs in return for information to be collected and paid for by the commercial sector that could facilitate calculation of MSY or other reference points. However, in by far the majority of cases, the extra information was not forthcoming and it then proved extremely difficult to reduce the TAC back to pre-AMP levels, as there was no basis for doing so.

Under a traditional model of natural resource management, private-regulated interests express concerns about the capacity of adaptive management to add continually to the conditions imposed by resource development authorisations without the security of finality.[125] Due to added costs and unknowns, the unwillingness of fisheries permit holders to provide extra information under the AMPs may be an example of this concern. However, if traditional models of natural resource management do not move towards ecosystems-based management, the alternative result can be deferred action and trial and error involving crisis management which magnifies losses to resources, undervalues information and overvalues action for action's sake.[126] By itself, the governing legislation for fisheries management in New Zealand (the Fisheries Act) does not provide a strong legislative foundation on which to implement adaptive management.[127] Notwithstanding, it may be considered that the TAC-setting process is a form of adaptive management in itself, along with accompanying resource permits that are subject to revision in light of environmental change and new information. However, as noted in geothermal chapter four the Waikato region's policy promoting adaptive management for large-scale use of geothermal systems is not explicitly anchored to *sustainable* use of *individual* geothermal systems. That chapter questioned the policy's use of the adaptive management term and suggested it could more accurately be described as "flexible management". Although "ensuring sustainability" is part of the Fisheries Act's purpose, it is questionable whether sustainability of fish stocks alone and the role of TAC can be considered genuinely sustainable, adaptive management, if TAC-setting is meant to refer to a type of adaptive management

[124] Personal communication with Dr Pamela Mace, Fisheries NZ (November 2016 – February 2017).

[125] JB Ruhl and Robert L Fischman "Adaptive Management in the Courts" (2010) 95 Minn. L Rev 424 at 477.

[126] At 431

[127] Hulme-Moir (2017), above n 109, at 251. Hulme-Moir's analysis finds that the legislative provisions relating to TAC/C do not confer enough "administrative flexibility" nor do they incentivise research, either by industry or the Ministry for Primary Industries, Fisheries NZ.

because the Act is not functionally concerned with the sustainable management of the aquatic environment and wider ecological biodiversity.

In the natural resource management context, the current interest in species and ecosystem resilience and adaptability is largely driven by climate change, which raises questions about whether law can keep up with an environment whose rate of change exceeds that for which human institutions were designed and whether existing law can withstand the new stresses it is beginning to encounter.[128] As a counter to a growing trend where managers and academic observers tend to assume adaptive management is uniformly the best strategy, Doremus makes several useful points in her examination of "adaptive management as an information problem".[129] This approach highlights systematic barriers to learning which can be reduced by changes in law, policy or institutional structure. While agreeing that adaptive management poses incentives, accountability and flexibility problems, she notes that adaptive management can also provide cover that allows resource management agencies to put off imposing politically controversial limits on economic activity. While it is a tool that can improve management outcomes over time in some contexts, it increases the costs of management, complicates oversight and imposes added institutional demands. If adaptive management is truly necessary, the ongoing confidence of stakeholders as well as policymakers will be needed to sustain it and—importantly in the New Zealand context—inter-agency coordination and capability.

D Ecosystem-based Management

In 1991, a government-appointed Fisheries Task Force tasked with assessing the (then) new QMS system found that the failure to address environmental impacts of fishing was a key weakness of the system and recommended adoption of ecosystems-based management.[130] Notwithstanding, 30 years on, a FNZ policy consultation document *Your Fisheries – Your Say* stated in its executive summary that the proposed changes put forward in the document help set the Ministry up to *explore* an ecosystem based approach to managing the marine

[128] Holly Doremus "Adaptive Management as an Information Problem" (2016) 85 North Carolina Law Rev. at 1455-1498.

[129] At 1455.

[130] B Wheeler and others "Fisheries Legislation Review: Public Discussion Paper" (Fisheries Task Force, Wellington, 1991).

environment.[131] In a 2016 submission in support of ecosystem-based management policy for fisheries management, New Zealand's Environmental Defence Society (EDS) commented on this issue, submitting that the application of this approach to fisheries management needs to be achieved through the development of an integrated ecosystem-based framework "outside the fisheries management system, which the QMS is required to operate within."[132] The submission also stated that a historical review showed that the Ministry's "concerted effort to retrofit environmental management into the QMS" had failed, with fishing activity contributing to two of the three top threats to New Zealand's oceans; that is:[133]

> bycatch of seabirds and marine mammals which are threatened or at risk of extinction; and seabed trawling and dredging for fish and shellfish which is degrading coastal habitats and ecosystems.

Ecosystem-based management may be highly relevant to crafting future legal requirements for information to manage fisheries resources because commercial fishers do not currently need to provide information on the environmental effects of fishing activity beyond reporting mammal and seabird bycatch and the health of individual fish stocks.

Over the last decades the international community has moved to formalise guidelines for an ecosystem approach and in 2021, New Zealand's Minister for Oceans and Fisheries released Cabinet Papers outlining the government's intention to "move towards a more ecosystem-based approach to fisheries management".[134]

IV Information Requirements under the Fisheries Act

The information requirements of the Fisheries Act and related fisheries management legislation and regulations are typical of a traditional natural resource management regime where property entitlements of permit holders are not outright and where the state as regulator must determine resource allocation and, in the case of fisheries, sustainable resource use. Customary fishing legislation and Te Tiriti Settlement legislation are an exception to this tradition because there is explicitly no pecuniary gain with customary fishing. However customary fishing regulations

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[131] Fisheries New Zealand *Your Fisheries – Your Say* (Discussion Paper 2019/02, February 2019) at 4. Emphasis added.

[132] Environmental Defence Society "Future of Our Fisheries 2016" (submission document, 20 December 2016) at 2.

[133] At 12.

[134] Cabinet Paper "Fisheries System Reform Agenda" (2 July 2021) at [7.2] and [45]; see also Cabinet Paper "Oceans and Fisheries Portfolio – Ensuring Healthy Ocean Ecosystems" (2 July 2021).

apply similarly exacting information requirements from customary fishers. Commercial permit reporting requirements largely reflect New Zealand's international obligations for fisheries management.[135]

A Information Requirements for Commercial Fishers

Access to ocean fisheries resources and control of commercial fishing activity are subject to the granting of a fishing permit and the fulfilment of related permitting reporting requirements and conditions. These include fishing vessel registration and industrial processes and equipment measures.[136] The Act authorises the making of regulations relating to a wide range of fishing matters such as: [137]

- controlling fishing, and the possession, processing, and disposal of fish;
- regulating or prohibiting the possession or use of any kind of gear, equipment, or device used for fishing; and
- prescribing matters about the installation and maintenance of equipment (including electronic equipment) to observe fishing.

Information reporting requirements for commercial fishers are largely contained in the Fisheries (Reporting) Regulations 2017, Fisheries (Geospatial Position Reporting) Regulations 2017 and Fisheries (Electronic Monitoring on Vessels) Regulations 2017.[138] Commercial permit reporting requirements specify what information must be recorded and reported by permit holders via permit-holder reports for every fishing trip and catch (or non-catch). Report-types comprise: [139]

- fishing trip reports, to record time, date and place of fishing trips;
- fish catch reports, recording the type of fish caught, and the time, date, and location of the catch;
- protected fish or non-fish species catch reports, including the species, quantity, and catch method used;
- fish processing reports, if fish are processed on board a vessel; and
- fish disposal and landing reports.

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[135] See Fisheries Act 1996 s 5(a) and sch 1A agreement for the implementation of the provisions of the UNCLOS (1982), above notes 78 and 92, relating to the conservation and management of straddling fish stocks and highly migratory fish stocks.

[136] Fisheries Act 1996, Parts 6, 10, and 12.

[137] Fisheries Act 1996 s 297 (1)(a), (1)(a)(viii), and (1)(ca). Section 297(2) also provides for further requirements and exemptions.

[138] Primary Production Committee *Report on Fisheries Bill* (1996) at [v] noted the recordkeeping and reporting provisions in the proposed Bill were substantially the same as those under the Fisheries Act 1983.

[139] Fisheries (Reporting) Regulations 2017 ss 7– 12.

Additional reporting requirements may be added under statutory sustainability measures.[140] Reports are made electronically and geospatial position reporting is required to verify fishing locations.[141] Electronic monitoring of commercial fishing activity via on-vessel video cameras is also becoming mandatory.[142]

Failure to provide information or improper divulging of information is an offence under the Act with penalties including imprisonment and fines. Permits may be cancelled for supplying false or misleading information.[143] Concordantly, the powers of inspection and monitoring of fishing activity are extensive under the Act.[144]

1 Misreporting, Observers and Electronic Monitoring

Misreporting and non-reporting of fisheries catch by commercial fishers (including fish dumping, high-grading of fish and unreported landings) is a long-standing information problem in fisheries monitoring and enforcement, with serious implication for fisheries sustainability.[145] While there are no accurate statistics for discarding (and misreporting), an overall conservative estimate since the QMS was introduced is that two times more fish are caught than officially reported.[146] Unreported industrial catch and discards account for the vast majority of the discrepancy, with recreational and customary catch playing a minor role in terms of volume. Misreporting is often tied up with catch discarding and high-grading of catch. Discarding may happen for a variety of reasons, primarily because the fisher does not have quota for the catch

[140] Fisheries Act 1996, s 11 – 16; s 16(7)(e).

[141] Fisheries (Geospatial Position Reporting) Regulations 2017; and Fisheries (Electronic Monitoring on Vessels) Regulations 2017.

[142] Fisheries (Electronic Monitoring on Vessels) Regulations 2017; and Fisheries (Electronic Monitoring on Vessels) Amendment Regulations (No 2) 2019. New Zealand regulations for on-board cameras on commercial fishing vessels came into effect in 2018. Since then, FNZ has been developing the systems and processes to support this and are now putting cameras on some fishing vessels. The regulations applied to these vessels from 1 November 2019 in a defined fishing area on the west coast of the North Island. A holding date of 1 July 2020 was set before the on-board camera regulations apply to other commercial fishing vessels. See Cabinet Paper "On-Board Cameras Across the Inshore Fishing Fleet" (2 July 2021); Hon David Parker (media release) "Wider roll-out of cameras on boats to support sustainability and protect marine life" (17 June 2021); and Ministry for Primary Industries (media release) "New Fisheries Regulations Bring in Advanced Reporting and Monitoring System" (13 July 2017).

[143] Fisheries Act 1996 Part 13 and s 305A.

[144] Fisheries Act 1996 Parts 11 and 12.

[145] Glenn Simmons and others "Reconstruction of Marine Fisheries Catches for New Zealand (1950 – 2010)" (2016) Institute for the Oceans and Fisheries, University of British Columbia (Working Paper Series, Working Paper #2015-87) at [1.2]. See further regarding bycatch and discards, Parliamentary Commissioner for the Environment (1999), above n 54, at [4.2.1].

[146] Simmons and others (2016), above.

pulled up. High-grading is a special case of discarding. When the fisher gets better paid for larger fish, but has a fixed quota, it is tempting for a commercial fisher to discard undersized fish.

The economic reasoning when the QMS was introduced was that guaranteeing fishing rights as a type of property right in perpetuity set the best stewardship incentives for quota owners to improve the value of their quotas through sustainable harvesting long term (primarily gauged via accurate catch reports). Although misreporting is a common problem worldwide in all fisheries management systems, it was thought quota ownership would dramatically reduce misreporting incentives.[147] However even with the introduction of the QMS, underreported landings and misidentifying landed species became profitable and the scale at which underreporting occurred post-QMS was dramatic and unexpected.[148]

An increase in quota values and their concentration into the hands of larger commercial operators meant that quota owners with a long-term perspective became more interested in owning than trading quota.[149] A fickle quota market and concentration of ownership was partly solved by the introduction of ACE (annual catch entitlements) which are traded freely.[150] However, over time lessees, who usually had delivery obligations with the quota owner, did not have the same long-term stewardship incentives as quota owners. [151] Although many examples of misreporting, high-grading and dumping have been investigated (see below), the lack of resource stewardship ethic in fishing practices is also due to additional systemic developments within the industry such as vertical integration of fishing and processing companies.[152]

Misreporting and non-reporting receives public news media attention (particularly unreported incidents concerning endangered marine mammal species) and claims of political and

[147] For example, prior to the QMS there was an incentive to minimize income tax by understating the amount of income earned from landings.

[148] Simmons and others (2016), above n 145, at [3.2.2]; and Parliamentary Commissioner for the Environment (1999), above n 54, at [3.8.9].

[149] Hersoug (2018) above n 13, at [4].

[150] By no means does this account for the whole of the misreporting problem, see Simmons and others (2016) above n 145, at [3.2.2]. See also Scott Walker and Ralph Townsend "Economic Analysis of New Zealand's Deemed Value System" (from proceedings International Institute for Fisheries Economics and Trade, Vietnam, July 2008).

[151] Hersoug (2018), above n 13, at [4].

[152] Parliamentary Commissioner for the Environment (1999), above n 54, at [3.8.9].

regulatory capture regarding a lack of Ministry compliance enforcement and prosecutions.[153] Official government investigations into misreporting occurred during the early-mid 1990s and into the 2000s,[154] with misreporting continuing to be a major fisheries management problem not least because information misreported (or unreported) affects the ability to accurately measure the sustainability of fishing practices and therefore the appropriate setting of TACC.[155] Investigations between 2004 and 2019 show how easily fishing operators and processors can cooperate in falsifying documents in a consistent manner to circumvent the checks and balances in such a document-intensive system.[156] Historically, to counter this permit-holder misreporting, fisheries legislation (since 1904) has provided for on-vessel government observer staff to monitor commercial fishing practices and recordkeeping.[157] The (re)introduction of on-vessel government observers in 1986[158] strengthened compliance monitoring and enforcement of the QMS from 1989 and contributed to the decline in invisible catch. However, observer coverage was limited to 20 to 25 per cent of the deep-water trawl fleet fishing—the most important fisheries. Coverage of the inshore fleet was negligible.[159]

Under the current Fisheries Act, the observer programme authorises observers to collect reliable and accurate information for fisheries research, fisheries management and fisheries enforcement via on-board observations made by government observer-staff on commercial

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[153] See for example, Conan Young "MPI Official Admits Fish Dumping Widespread" *Radio New Zealand News* (19 September 2016); Greenpeace New Zealand (press release) "Fisheries Companies Win Contract to Monitor Themselves" (29 May 2016); Ministry for Primary Industries (media release) "MPI Accepts Findings of Independent Review into Fishing Operations" (16 December 2016); Henry Cooke "NZ First Sinks Coalition Partners' Plan for Fisheries Review" *Sunday Star Times* (2 December 2018); and Russel Norman "Nash and Jones are Leading NZ Fishing into Rotten Waters" *The Spinoff* (8 February 2019).

[154] Government investigations into false reporting occurred during the early-mid 1990s. The largest investigation charged 21 individual companies with over 2,000 offences amounting to over NZD 2.5 million in fines and forfeiture of quota and fishing vessels; see Simmons and others (2016), above n 145, at [3.2.2]. The Parliamentary Commissioner for the Environment (1999), above n 54, at [3.8.9] described the offending as a complex conspiracy over several years to misreport illegally caught fish.

[155] Fisheries New Zealand *Future of our Fisheries: Integrated Electronic Monitoring and Reporting System* (Vol III, November 2016).

[156] Simmons and others (2016) above n 145, at [3.2.2] and [3.3.3.9]. See for example, *Ministry for Primary Industries v Hawkes Bay Seafoods Ltd* [2019] NZDC 2599; [2019] DCR 585; and Kevin Stent "Sentencing Hearing for HB Seafoods and Directors Begins" *Stuff Media* (6 August 2018).

[157] *Marine Fisheries Management* (1990), above n 66, at 33-39; and Parliamentary Commissioner for the Environment (1999), above n 54, at [3.8.9].

[158] Fisheries Act 1983 ss 67C – 67H note these were called "scientific observers" while the Fisheries Act 1996 uses "observers" operating under the "observer programme"; and FNZ lists "observer services" at <www.fisheries.govt.nz/growing-and-harvesting/fisheries/operating-as-a-fisher/observer-services/>.

[159] Simmons and others (2016) above n 145, at 17.

fisheries vessels.[160] Fisheries observers may collect any information on fisheries resources, fishing (including catch and effort information), the effect of fishing on the aquatic environment and the transportation of fish, aquatic life or seaweed or on any other matter.[161] Reasonable notice is given before an observer is placed on a vessel and an observer has access to all relevant parts of the vessel.[162] Observers collect independent data to compare to fishing vessel data and keep a separate catch and effort logbook. Observers record catch calculations and amounts for all species caught and details of fishing operations. Real-time observation of commercial fishing operations is a widely accepted practice in international fisheries compliance monitoring. Well-documented studies show significant differences between fish catch reported by vessels with and without observers on board.[163] However, practical and cost considerations have limited the extent of observer coverage in New Zealand.[164] In 2017, approximately 8.4 per cent of commercial fishing activity was being monitored by observers in New Zealand, with monitoring levels below at least 20 per cent being recognised internationally as inadequate to effectively monitor fisheries catch and protected species bycatch.

In order to supplement observer coverage, the Fisheries Act 1996 and the Search and Surveillance Act 2012 allow for equipment to observe fishing and transportation for the purpose of constant (24 hour) monitoring, verification and compliance.[165] Fisheries (Electronic Monitoring on Vessels) Regulations 2017 provides further detailed information about permit holders' legal obligations. Vessel-specific monitoring plans and supply of electronic information for fishing, transportation and associated information include[166]:

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[160] Fisheries Act 1996 s 223(1)(a) observer purposes also include collection of reliable and accurate information about vessel safety and employment on vessels, and compliance with maritime rules relating to pollution and the discharge of waste material from vessels, s 223 subs (1)(b) and (c).

[161] Fisheries Act 1996 s 223(4). For more detail on the types of information covered by these areas see s 223(4)(a) to (g).

[162] Fisheries Act 1996 ss 224 and 225.

[163] Ministry for Primary Industries "Integrated Electronic Monitoring and Reporting System" (Regulatory Impact Statement, May 2017) at [47].

[164] At [43] – [49].

[165] Fisheries Act 1996 s 227A; and Search and Surveillance Act 2012 s 199; see further and Maritime New Zealand <www.maritimenz.govt.nz/commercial/environmental/marine-dumping.asp> and Environmental Protection Authority <www.epa.govt.nz/industry-areas/eez-marine-activities/roles-and-responsibilities/>. See also Wheen (2012), above n 90, at 477-497; and Kelsey Richardson and Others "Building Evidence around Ghost Gear: Global Trends and Analysis for Sustainable Solutions at Scale" (2019) 138 Marine Pollution Bulletin 222-229.

[166] Fisheries (Electronic Monitoring on Vessels) Regulations 2017 cls 9 and 17.

(1) The electronic monitoring equipment on a vessel must be used to—

(a) record the fishing done from the vessel; and

(b) record any fish, aquatic life, or seaweed taken; and

(c) record any transportation of fish, aquatic life, or seaweed on the vessel (whether or not it was taken under the permit holder's permit); and

(d) detect and record associated information in accordance with any requirements specified in a circular.

(2) The video recording must enable the chief executive to, with reasonable accuracy and to the extent specified in a circular,—

(a) identify—

(i) the type of fish, aquatic life, or seaweed taken or transported; and

(ii) the types and features of fishing gear used; and

(iii) any bycatch mitigation measures adopted or used; and

(b) estimate the size and quantity of the fish, aquatic life, or seaweed taken or transported.

Prior to these regulations, the use of such electronic monitoring (video camera surveillance) of real-time operations on vessels had been trialled to monitor fisheries activity for species particularly at risk.[167] However, there was no compulsory electronic monitoring for all commercial fisheries vessels. The measures under the 2017 regulations (along with geospatial records and electronic rather than paper-based reporting) comprise the Integrated Electronic Monitoring and Reporting System (*IEMRS*). In its regulatory impact statement for *IEMRS*, FNZ predicted that electronic reporting and geospatial reporting by all commercial fishing permit holders would "represent a major improvement in reporting" and that without electronic monitoring (video cameras) being a component of this surveillance the *IEMRS* would:[168]

> [f]ail to address a number of urgent fisheries management issues. Most notably, verification of fisher reports would remain constrained and public confidence in the fisheries would not be restored.

It was also noted that camera monitoring would secure New Zealand's access to international markets over time, where previously some fisheries had failed to gain international sustainability certification due to lack of verifiable compliance information of commercial

[167] Trials and deployment of electronic monitoring technology in New Zealand have taken place for well over a decade, see Fisheries New Zealand *Future of our Fisheries: Integrated Electronic Monitoring and Reporting System* (Vol III, November 2016) at 12.

[168] Ministry for Primary Industries (2017), above n 163, at [89(a)-(b)].

fishing activity.[169] Regarding monitoring of the whole fisheries supply chain, *IEMRS* would also deter discarding activity particularly in the inshore fishery with its link to locally marketed fish species.[170]

The implementation of *IEMRS* was met with resistance from the commercial industry—especially in-shore fisheries permit holders—with some claiming the regulations were a breach of personal privacy and an infringement on property rights.[171] Regarding the right to personal privacy, a declaration from the High Court held that the reasonableness of monitoring work activities in private places is to be assessed on context; the Court noted "[f]ishers are exercising a regulated privilege to take a resource that is of national significance", the sustainability of which is "a matter of real importance in preserving New Zealand's future resources."[172] The property rights claim concerned disclosure risk to third parties of permit-holder knowledge of specific fishing locations recorded by the new GPS tracking regulations. The Court acknowledged this risk. However, it held that the regulations were not inconsistent with the statutory purpose of the Fisheries Act (or New Zealand Bill of Rights Act 1990). [173] In addressing the claimants' concerns, the Court noted that "there may well still be opportunities for refinement of the detail to ameliorate the causes of the most acute of the fishers' concerns" because FNZ had not yet promulgated circulars regarding specifically how the monitoring system would be carried out.[174] Improving commercial fisher reporting compliance remains on the current government's radar.[175]

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[169] For example, Marine Stewardship Council certification can add a 20–30 per cent price premium on another 5 per cent of New Zealand's exported seafood, generating an additional NZD 8–12 million for exports markets annually. See Ministry for Primary Industries "Integrated Electronic Monitoring and Reporting System" (Regulatory Impact Statement May 2017) at [105(c)]. For more on overseas trends regarding the use of electronic monitoring and reporting see Fisheries New Zealand *Future of our Fisheries: Integrated Electronic Monitoring and Reporting System* (Vol III, November 2016) at 10-11.

[170] Inshore fisheries especially operate to the specific instructions of Licensed Fish Receivers (LFR) as to what the LFR is prepared to purchase. This has the effect, whether intended or not, of species the LFT does not want in many cases being discarded because there is no market (or perceived market) for those species or fish of certain sizes. Electronic monitoring deters this practice by providing the ability to verify catch and encourage both fishers and LFRs to consider how to make use of those species. It also encourages operators to carry or obtain an ACE (annual catch entitlement) package that is better aligned with the expected catch mix. See Ministry for Primary Industries (2017), above n 163, at [105(a)].

[171] *Commercial Fishers Whanau Inc v Attorney-General* [2019] NZHC 1204.

[172] At [92] per Dodson J.

[173] At [54] – [69] and [92] – [94].

[174] At [77] – [78] and [104].

[175] See Cabinet Paper "Ensuring Healthy Ocean Ecosystems" (2 July 2021).

Legal requirements for information from permit holders are essential to fisheries management. However, as a form of regulatory self-management, permit-holder reporting has failed. Ministry decisions not to prosecute offenders and to call off an intended independent inquiry into the matter in particular raised public ire regarding accountability and transparency in regulatory decision-making.[176] For example, in a media statement in defence of a decision by the Minister not to prosecute regulation breaches (fish dumping and non-reporting estimated to be over 700 tonne across industry in one season for one particular species), Ministry of Primary Industries head of compliance management explained:[177]

> [W]e know from experience that prosecution will achieve behavioural change for maybe four or five years at best. But if you want to achieve sustained behavioural change over a fleet of vessels operating in a fishery, you need to have a different method. […] We briefed quota holders and vessel captains and then we sat down with individual companies and said these are the behaviours we're seeing, these create a compliance risk, you need to change your behaviours, if you don't change those behaviours then you're going to attract greater attention from us.

This reasoning demonstrates a value judgement based on a regulatory-compliance strategy the effects of which have a direct impact on fulfilment of information provisions.[178] As noted in chapter five, an intention to avoid regulatee alienation is an important component of compliance-based regulation. Waivers or exemptions can be an attempt to provide regulation which suits the regulatee in the hope of saving time and resources later in attempting to ensure enforcement. The legitimacy paradox arises within this context: ie where a regulatory enforcement approach taken may be deemed necessary to maintain the acceptability of the regulation to the regulated community, thus avoiding its alienation, the public may see the regulatory approach as illegitimate and too light-handed.

A decision not to prosecute also aligns with a compliance approach to rule enforcement where a more "bullying" approach can stimulate opposition to the regulation by the regulated,

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[176] See Conan Young "MPI Official Admits Fish Dumping Widespread" *RNZ News* (19 September 2016).

[177] See (n.a) "MPI Defends Not Prosecuting over Hoki Catch" *RNZ News* (24 May 2018).

[178] Ministry for Primary Industries employs the VADE (voluntary, assist, deter, enforce) compliance model; see Compliance Common Capability Programme "Achieving Compliance: A Guide for Compliance Agencies in New Zealand" (Wellington, 2011) at 38-40. See also Fisheries New Zealand "Proposed Technical Amendments to Fisheries Regulations" (Discussion Paper No: 2022/01, January 2022) at 10. Regulatory conversations in this context are also hailed as a sign of "responsive" regulation, see P Selznick *The Moral Commonwealth: Social Theory and the Promise of Community* (1993) at 470.

prompting non-cooperation in investigations and the compliance process. A compliance approach can be used in an attempt to stimulate compliance and so bring significant strategic advantages.[179] Whether an enforcement process consists of conversation (usually styled the compliance model of enforcement) involving conciliation, education and negotiation or adversarial (the deterrence model) is shaped by a number of factors, including:[180]

- the nature of the breach (whether one-off or persistent);
- judgments as to its seriousness (the extent to which it is in excess of limits set by the rule, for example, or the nature of its consequences);
- assessments made of the nature of the regulatees (whether they are well- or ill-intentioned, well- or ill-informed, whether the breach was careless, negligent or malicious); and
- the social and moral legitimacy of the regulation being enforced.

Especially where there may be moral ambivalence surrounding issues of regulatory rule breaches, enforcers often see conversations as a necessary part of the regulatory process.[181] However, serious regulatory breaches by fleets of fishing vessels over a period of time (as in the case above) push the legitimacy paradox to a point of crisis. It is not only the public whose perception of fairness and accountability is affected, but that of others within the regulatory setting, including commercial permit holders and customary and recreational fishers, all of whom are subject to various rules administered by FNZ. The social and moral legitimacy of the regulation strategy for commercial fishing compliance, coupled with a conversational approach, manifestly comes into question.

Further, a compliance approach not to prosecute raises questions: What role does or should risk management play? Besides the risk of permit-holder alienation, what other risks are involved? Is the risk of permit-holder alienation balanced against social-licence risks about perceptions of fisheries management? What long-term effects does taking a light-handed compliance approach have on permit holders, society and the environment? Black suggests poor regulatory decision-making that brings the legitimacy paradox to a crisis point can be a combination of long-term compliance strategy failure on the regulator's part, inadequate law or regulation itself and institutional capacity issues. A combination of these factors is at play in New Zealand

[179] Julia Black "Talking about Regulation" in Michael Harris and Martin Partington (eds) *Administrative Justice in the 21st Century* (Hart Publishing, Oxford, 1999) at 259.

[180] At 257.

[181] At 257 and 259. For New Zealand research on compliance decision-making see Bronek Kazmierow, Kay Booth, and Elaine Mossman *Commercial Fishers' Compliance Decision Making: Perceptions, Experiences, and Factors Influencing Regulatory Compliance* (report prepared for the Ministry of Fisheries by Lindis Consulting, 19 July 2010).

commercial fisheries management. As noted, the legitimacy paradox concern is critically linked to the expectations which surround the role (and rule) of law.[182]

The FNZ consultation document *Your Fisheries – Your Say* provides another example of FNZ's approach to commercial fisheries compliance and consultation as regards "ensuring effective and fair offences and penalties" under the Act, with the Ministry's proposing to introduce a more comprehensive range of offences and penalties to ensure they are "fair and appropriate".[183] Proposed options and consultation questions and statements where connecting fair and understandable rules to the "integrity" of fisheries management are listed. For example, "maintaining a level playing field for commercial fishers, where everyone follows the rules, is important to protecting the integrity of our fisheries management system". Rule determinacy and rule interpretation issues are apparent in the offences, penalties and defences issues. Issues raised include non-graduated offences and discretionary decision-making around prosecutions, with suggestions and options for improved rules for offences and penalties all couched in language of reasonable negotiation and fair play.[184] The document makes frequent reference to the need for "incentivising" permit-holder compliance (over 20 references in the 28-page document).

Conversation-styled engagement about the meaning and application of rules can be an important way to place the individual in the bureaucratic process, as conversations are the human face of bureaucratic regulation.[185] Regulators establishing a reputation for fair and consistent treatment can develop trust. However, conversations are not necessarily an unproblematic phenomenon whose presence should be given an unreserved welcome. Questions of both effectiveness and acceptability and legitimacy are contested and inextricably bound. The criteria against which a conversation should be assessed are clear. In conversation, both regulator and regulated should maintain the integrity of the regulation and its commitment to its goals (however vague or contradictory they may be), while acknowledging the claims and interests of an appropriate range of persons. A compliance strategy narrowly focused on

[182] Black (1999), above n 179, at 266.

[183] Fisheries New Zealand *Your Fisheries – Your Say* (Discussion Paper 2019/02, February 2019) at 15.

[184] G Teubner "Substantive and Reflexive Elements in Modern Law" (1983) 17 Law and Soc Rev 239 refers to this as "post bureaucratic" rationality, with flexibility and responsiveness as its hallmarks. See also Selznick (1993), above n 178, at 286-287.

[185] Black (1999), above n 179, at 263.

the interests of commercial permit holders does little to acknowledge the wider claims and interests of society, nor does it show a regulator's resistance to claims of industry capture.

Furthermore, the commercial fisheries compliance approach is starkly different compared to the language FNZ uses for recreational compliance monitoring which uncovers "illegal" practices termed as "poaching" and "black-market" activities (selling fish without a commercial quota and receiving fish without a Licenced Fish Receivers licence).[186] These activities are typically framed as "criminal" and "risking sustainability" and are apprehended by MPI compliance officers who conduct "undercover operations", "execute search warrants", "close in", "swoop on", "shut down" and "protect our fisheries".[187] McCormack suggests that to understand the context of the assumed morality of this discourse (including the particular way "sustainability" is used in fisheries management), it is "necessary to pay attention to the state's role in fisheries, a role which has increasingly shifted towards monitoring and protecting quota flows".[188]

Regarding commercial permit-holder reporting under information requirements, despite recent strides in the introduction of electronic monitoring and the placement of some cameras on vessels, an "endemic lack of trust in fisheries management" means that there is a lack of confidence that they will be implemented successfully.[189] However, the newly created ministerial portfolio for *Oceans and Fisheries* and recently renewed focus on improving fisheries management provide some hope.[190]

2.1 Access to Regulatory Conversations

The right to fish in its many forms has been one of the most debated topics for the last three decades, with New Zealand's commercial fishing sector at the forefront of such debates.

[186] McCormack (2017), above n 18, at 42.

[187] At 42. McCormack notes, for example, the FNZ website notice: "You can report poaching, suspicious, or illegal activity online" and by calling free phone "0800 4 POACHER", at <www.mpi.govt.nz/fishing-aquaculture/recreational-fishing/fishing-rules>.

[188] McCormack (2017), above n 18, at 42.

[189] Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021) at 6.

[190] See Cabinet Papers (2 July 2021): "Oceans and Fisheries Portfolio – Ensuring Healthy Ocean Ecosystems"; "Initial Response to Prime Minister's Chief Science Advisor's Report on Commercial Fishing"; "Fisheries System Reform Agenda"; "On-Board Cameras Across the Inshore Fishing Fleet"; "Revitalising the Hauraki Gulf – Government Sea Change Strategy"; "Fisheries Amendment Bill: Strengthening Fishing Rules and Policies: Offences and Penalties and Agile Decision-making"; and "Fisheries Amendment Bill: Strengthening Fishing Rules and Policies: Landings and Discards".

However, a focus on commercial fishing to the exclusion of non-commercial fishing interests provides an incomplete depiction of the complex and dynamic interactions that occur between people and the institutions managing fisheries resources. Accountability is often a delicate mix of a number of factors, including demonstrated effectiveness, communication, transparency of processes and systems and openness to the concerns and priorities of other stakeholders including Māori and the wider public interest. What are the nature and opportunities of customary and recreational fisher groups to access regulatory conversations? Black reminds that access to and who participates in regulatory conversations can be at once their most necessary and their most contentious aspect.[191]

Under the Fisheries Act 1996 there are opportunities for input into decision-making affecting policy and regulation, however the level of consultation sought by FNZ varies between groups. Broadly, the Fisheries Act consultation requires affected parties to be consulted regarding sustainability measures taken by the Minister and decisions effecting among other things catch limits, TAC, fisheries plans, fishing-related mortality of mammal or customary areas and catch methods.[192] Additionally, after setting or varying any sustainability measure or after approving, amending or revoking any fisheries plan, "the Minister shall, as soon as practicable, give to the parties consulted, reasons in writing for the decision".[193] The Act reads:[194]

> Before doing anything under [relevant sections of the Act] the Minister shall consult with such persons or organisations as the Minister considers representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned, including Māori, environmental, and recreational interests […].

Ministry attempts to coordinate commercial and recreational fishing interests through improving policy design have not progressed.[195] So, while the Ministry provides access to the conversation under consultation provisions and via policy consultation documents, trust and distributions of power issues stall progress in improving management coordination.

The Minister is also required to:[196]

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[191] Black (1999), above n 179, at 271.

[192] Fisheries Act 1996 ss 12 and 11(3).

[193] Fisheries Act 1996 s 12(2).

[194] Fisheries Act 1996 ss 12(1)(a) and 21(2).

[195] See for example Raewyn Peart *Voices from the Sea* (Environmental Defence Society, Auckland, 2018) at 142-144; and Lock and Leslie (2007), above n 41, at [5.3].

[196] Fisheries Act 1996 s 12(1)(b).

> [P]rovide for the input and participation of tangata whenua having a non-commercial interest in the stock concerned; or an interest in the effects of fishing on the aquatic environment in the area concerned, and have particular regard to kaitiakitanga.

Fisheries NZ policy emphasises the need (with a particular emphasis on industry) for "buy-in" in fisheries management. The Ministry explicitly states that stakeholder buy-in is crucial to successful policy outcomes. Consultation engenders collaboration and acknowledges the importance of stakeholder interests and expertise. Regulatory conversations occurring via mandatory consultation speak to the nature and opportunities of others to access the conversation. Fisheries NZ invites public feedback on policy development. For example, FNZ's *Your Fisheries – Your Say* is a document for consultation with the public, recreational fishers, the fisheries industry and Māori which invites "every New Zealander […] to have a say" on Ministry proposals to improve fisheries management.[197] It shows that the Ministry is striving to be more proactive and collaborative in its management approach.[198] As open to "all New Zealanders", access to the conversation is arguably made very open. However, whether or not public (or non-commercial) input is effective is another matter and is in part a political and social question. Bess argues that the tone of such policy is "rather vague" and "somewhat misleading" in its statements about what the Ministry considers is going well.[199] For example, no explanations are provided regarding the management lessons learned over the decades and the policy review is confined only to the fisheries management system as it stands, thus leaving many core elements such as the Crown's obligations under Te Tiriti and the rights and interests of tangata whenua and customary management outside its scope. Further, once decided, FNZ policy decisions are not reviewable except via the Court's judicial review process—a significant curtailment to public engagement.

In contrast the language of buy-in does not appear in the policy language regarding tangata whenua consultation and participation. This may be due to both the non-commercial nature of customary fisheries and the Act's and regulations' placing emphasis on the responsibility of Māori to apply for customary status and customary fishing areas.

The effectiveness of governance arrangements established for one purpose can be undermined by different Crown agencies in respect to related issues. Customary (and commercial) fisheries management is based on the premise that rights holders are responsible for representing their

[197] Fisheries New Zealand *Your Fisheries – Your Say* (Discussion Paper 2019/02, February 2019).

[198] At 4 and 6.

[199] Bess (2016), above n 38, at 73.

own interests and for engaging with other rights holders in fisheries management processes. For example, in the two approaches to fisheries compliance for commercial and recreational fishers, the latter are often tangata whenua. A lack of capacity (or unwillingness) to engage with rights holders poses challenges to the successful implementation of fisheries management both for fisheries stakeholder groups and for the Crown. If commercial fishers are seen to have "special treatment" due FNZ's compliance strategy, tangata whenua and recreational fishers' engagement is compromised.

Despite compulsory consultation, access to regulatory conversations for recreational fishers is also complicated because there is no single sector representative. Most Fisheries Act references to recreational fishing concern decision-maker obligations to consult with those who have a recreational interest in fishing and concern the appointment of interest representatives.[200] The primary opportunity for recreational fishing interests to have input into fisheries management processes is through public consultation documents.[201] Recreational fishing forums involving local fishing club and recreational fishing representatives and government staff also provide face-to-face interaction with government staff. Forum members share their knowledge and experience about the recreational fishing sector, charter boat operators and spearfishing which is incorporated into the information presented to the Minister.[202] However, while the capability of some recreational fishing organisations has continued to improve, resources remain limited; few are nationally recognised and none has a mandate to represent all recreational fishers.[203]

In its policy submission on FNZ policy consultation document, *Future of Our Fisheries*, the EDS summarised the commitment of principal participants and the ability of participants in fisheries management to access regulatory conversations:[204]

> At the heart of fisheries decision-making is the stock assessment process. The results of the stock assessment directly drive management decisions. This is a highly technical, scientific and resource intensive process. Only those with a high degree of technical

[200] Fisheries Act 1996 ss (12(1)(a), 16(2)-(3), 21(1)(a)(ii)-(2), 25(3)(b), 75A, 177(2)(b)(i), 186A(7)(a), 186B(6)(a), 186D(1)(c), 186H(4), 188(1), 277(1)(b)(ii), and s 310.

[201] Bess (2016), above n 38, at 32. Unlike policy development processes under the RMA 1991, the Minister is not obliged to consult with the public under the Fisheries Act 1996, however FNZ policy discussion documents generally invite public feedback.

[202] At 32. See Bess (2016) for a historical overview of New Zealand's recreational fishing representative organisations, including: New Zealand Recreational Fishing Council (1987—2015); New Zealand Big Game Fishing Council, since 2009 named New Zealand Sport Fishing Council (NZSFC) (1957—date); Option 4 (2000—date); LegaSea (2012—date) launched by NZSFC; and Our Fishing Future (2013—date).

[203] Bess (2016), above n 38, at 46.

[204] Environmental Defence Society (2016), above n 132, submission point no. 17.

> knowledge, with the resources to engage scientific advice, and the ability to self-fund attendance at numerous working group meetings, can have meaningful input. The only sector with such resources is the commercial fishing sector, with the recreational fishing, customary fishing and environmental groups effectively excluded. This means that stock assessment processes primarily consists of a two-party dialogue between the commercial fishing sector and MPI.

Although the Ministry sometimes establishes broader stakeholder groups to provide advice on the management of specific shared fisheries which are dominated by recreational take, the recreational fishing sector has generally been included. However, despite being specifically identified as an interested party under the Act the environmental sector is not mentioned in consultation documents.[205]

B Information Requirements for Māori – Customary Fishing Regulations

The legal information requirements in this section relate to three area management tools (AMT) which attempt to provide for Māori customary fishing activity ie taiāpure (local fisheries) under the Fisheries Act 1996[206] and, via the Fisheries (Kaimoana Customary Fishing) Regulations 1998 and Fisheries (South Island Customary Fishing) Regulations 1999, the option for Māori to appoint tangata kaitiaki and tangata tiaki (customary guardians).[207] Building on this appointment, a customary guardian may then apply to the Minister for the creation of a mātaitai reserve within a customary fishing area. The temporary closure of fishing areas in relation to customary food gathering and regulation-making relating to customary fishing are also provided under the Fisheries Act 1996.[208] Although not considered an AMT customary fishing may be exempt from the Fisheries (Amateur Fishing) Regulations 2013 in some circumstances.[209]

Customary fishing is either allowed via regulations, (and/or) bylaws or "authorisations" made under regulations. Under the customary fishing regulations, the Minister must provide

[205] Fisheries Act 1996 s 12.

[206] Fisheries Act 1996 ss 174 – 186B.

[207] Note "customary guardians" is used generically in this chapter for ease of discussion to include both tangata kaitiaki and tangata tiaki.

[208] Fisheries Act 1996 ss 186, 186A, and 186B relate to regulation-making for customary fishing and "temporary closure" of fishing areas, fisheries, and restrictions on fishing methods.

[209] Fisheries (Amateur Fishing) Regulations 2013 cl 52.

information and assistance to customary guardians as necessary for the proper administration of the regulations.[210]

1 Taiāpure – Local Fisheries

Under Part 9 of the Fisheries Act, a taiāpure is a local fisheries which is part of the suite of management tools that Māori may use for customary fisheries management.[211] The objective of the taiāpure is to make "better provision for the recognition of rangātiratanga and of the right secured in relation to fisheries by Art II of the Treaty of Waitangi."[212] The creation of taiāpure was an attempt to allow for non-commercial aspirations of Māori and to provide a mechanism through which local Māori could play an advisory role to the Ministry of Fisheries.[213] Taiāpure can relate to estuarine or littoral coastal waters that "have customarily been of special significance to any iwi or hapu, either; as a source of food; or for spiritual or cultural reasons". [214] Māori must collaborate with other user-groups such as recreational and commercial fishers in the management of taiāpure.[215]

Information requirements for a proposal to establish a taiāpure require a proposal to describe the proposed area and description of the Māori, traditional, recreational, commercial and other interests in the proposed area.[216] A proposal must also describe the species of fish, aquatic life or seaweed in the proposed area of particular importance or interest.[217] The proposal must state why the area has customarily been of special significance to an iwi or hapu, either as a source

[210] A Minister must do this in accordance with the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 s 10; Fisheries (Kaimoana Customary Fishing) Regulations 1998 cl 33; and Fisheries (South Island Customary Fishing) Regulations 1999 cl 38.

[211] The Māori Fisheries Act 1989 as an interim settlement for defining Māori rights to fisheries first provided for taiāpure. Boast (1999), above n 5, at 131-133 notes "quite what the differences are between the two types [taiāpure and mātaitai] of reserves is something of a puzzle"; presumably the provisions relating to taiāpure-local reserves were left in place in order to continue to safeguard such reserves already established or in the process of being established under the Māori Fisheries Act 1989.

[212] Fisheries Act 1996 s 174.

[213] Lock and Leslie (2007), above n 41, at [4.5.1.3].

[214] Fisheries Act 1996 s 174.

[215] Fisheries Act 1996 s 184.

[216] Fisheries Act 1996 s 177(2)(a) and (b)(i).

[217] Fisheries Act 1996 s 177(2)(b)(ii).

of food or for spiritual or cultural reasons.[218] Finally, the proposal must set out its policies and objectives and "contain such other particulars as the chief executive considers appropriate".[219]

Taiāpure are managed by a committee that is representative of the local community; the committee can recommend regulations to the Minister.[220] Such regulations can only be made with respect to fishing or fishing-related activities within the taiāpure and both commercial and non-commercial fishing can occur within a taiāpure.[221]

Since the late 1990s, Māori interest in establishing taiāpure local fisheries has diminished due in part to the length of time required for the legislative process (often up to two years) when compared to that required for establishing mātaitai reserves.[222] According to FNZ, 10 taiāpure existed in 2019, with only two of these having taiāpure-specific regulations.[223]

1.1 Tangata Kaitiaki and Tangata Tiaki

Under the Fisheries (Kaimoana Customary Fishing) Regulations 1998 and Fisheries (South Island Customary Fishing) Regulations 1999, tangata whenua may appoint tangata kaitiaki or tangata tiaki (customary guardians) for general customary food gathering.[224] Customary guardians may also participate in fisheries management by providing input into the process of setting or varying sustainability measures or developing management measures concerning the whole or any part of the customary fishing area (rohe moana) for which they have been

[218] Fisheries Act 1996 s 177(3)(a)(i) and (ii).

[219] Fisheries Act 1996 s 177(3)(b) and (c).

[220] Fisheries Act 1996 ss 184 and 185. Taiāpure management committees are made up of members from local iwi or hapu and often commercial and recreational fishers as well as other interested parties (eg scientists, environmental groups); see <www.mahingakai.org.nz/resources/what-are-amts/>. For a more detailed overview of the legal processes involved in creating a taiāpure see *Law of New Zealand* Fisheries (online ed) at [145] – [147].

[221] Fisheries Act 1996 s 186.

[222] Randall Bess and Ramana Rallapudi "Spatial Conflicts in New Zealand Fisheries: The Rights of Fishers and Protection of the Marine Environment" (2007) 31 Marine Policy 719 at 722 [3.3.1]. Getting a regulation (eg. a new bag or size limit, or closure) in place can be a slow process with up to 18 months passing between application and establishment in some cases, see <www.mahingakai.org.nz/resources/what-are-amts/>. Additionally, the application process for a taiāpure is potentially a 19-step process possibly taking up to 2 years, see <www.mahingakai.org.nz/wp-content/uploads/2014/01/Area-Management-Tool-guidebook.pdf> appendix 1.

[223] See <www.fisheries.govt.nz/law-and-policy/Māori-customary-fishing/managing-customary-fisheries/customary-fisheries-management-areas/>. See further Anne-Marie Jackson "Erosion of Māori Fishing Rights in Customary Fisheries Management" (2013) WLR 59 at 70 and 71.

[224] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cls 5 – 17; Fisheries (South Island Customary Fishing) Regulations 1999 cls 17 – 23. Note, the remainder of this section refers only to the Fisheries (Kaimoana Customary Fishing) Regulations 1989 as the two sets of regulations are largely similar.

appointed.[225] These positions are voluntary and require considerable work. In 2006, approximately 280 customary guardians were numbered in New Zealand.[226]

Customary guardians must report to the FNZ every three months to provide information regarding the customary fishing authorised.[227] For this reporting to occur, detailed record-keeping must be undertaken. Reported information then assists the Minister in assessing the sustainability of fish stocks. An example of the detailed record-keeping and reporting requirements states that no customary fishing may occur unless an authorisation (by a customary guardian) has been made in a particular form which specifies:[228]

(a) the date or dates that the species may be taken;
(b) the persons who are authorised to take the species;
(c) the species that may be taken;
(d) the quantity of each species that may be taken;
(e) size limits relating to each species to be taken;
(f) the method by which each species may be taken;
(g) the area or areas in which the species may be taken;
(h) the purpose for which the species may be taken;
(i) the venue at which the catch may be used; and
(j) any other matters concerning customary food gathering the Tangata Kaitiaki/Tiaki may reasonably specify, including instructions for the disposal of any fish, aquatic life, or seaweed taken as an inevitable consequence of taking the fish, aquatic life, or seaweed to which the authorisation relates.

A further example of the particularity of the reporting requirements states: if commercial *and* customary fishing occurs on the same trip, all fish, aquatic life or seaweed taken on that trip for customary food gathering purposes must be treated as:[229]

> having been taken otherwise than under these regulations unless they are placed in separate, marked containers and are clearly identified as having been taken for customary food gathering purposes.

[225] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cls 14 and 16, and Fisheries Act 1996 s 11.

[226] Lock and Leslie (2007), above n 41, at [4.8.3].

[227] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 15.

[228] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 11 subs (3), (6), (7) and sch form 2, and cl 12 require an authorisation-holder to produce evidence or details of the authorisation to a fisheries officer when reasonable requested to do so, or if a fisheries officer has reasonable cause to suspect an offence has been committed under the regulations.

[229] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 13.

These examples show the frequency and type of information FNZ perceives as necessary to manage customary fisheries. Although the number of customary guardians may be relatively high (280), learning how regularly and in how much detail FNZ receives customary catch information reports from customary guardians following these detailed requirements could be revealing.[230] Findings may support the unsurprising fact that many Māori opt to fish under recreational regulations where no licensing or reporting is required rather than under customary regulations.[231]

2 *Mātaitai Reserves*

If having followed the regulatory process set out in the Fisheries (Kaimoana Customary Fishing) Regulations 1998,[232] the Minister approves the official appointment of a customary guardian, a guardian may then make an application for a mātaitai reserve.[233] Both taiāpure and mātaitai are permanent fishery protection areas, with the main difference between a mātaitai and taiāpure being that commercial fishing is prohibited within mātaitai. Mātaitai are set up in traditional food gathering areas to enable Māori to control fishing resources in culturally significant areas.[234] However, the process of establishing mātaitai can be lengthy and includes consultation with the local community and written submissions from commercial quota owners and recreational fishers.[235] Like taiāpure, mātaitai management committees can recommend bylaws to be approved by the Minister, a quicker process than making regulations for taiāpure.[236]

Only recognised tangata whenua or customary guardians are eligible to apply for or manage mātaitai reserves and in contrast to taiāpure management there is no provision for any

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[230] Te Ohu Kiamoana Trust provides an online customary fisheries management tool "IKAnet" to enable tangata kaitiaki/tiaki to create digital customary authorisations, digital reports, analysis and other services; see <www.teohu.maori.nz/ikanet/>; see also Fisheries New Zealand *Hi Ika: Customary Fisheries Magazine* "A Smart Tool for Customary Fisheries" (Spring 2019) at 7.

[231] See generally Te Taiawatea Moko-Mead and Te Aomihia Walker "The Evolution of Our Customary Rights" (Hotoke 2021) *Te Korowai o Tangaroa Magazine* (Panuitanga 1) 12-15 at 15.

[232] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cls 5 – 10. See note at, above n 224.

[233] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cls 18 – 32. Mātaitai reserves may also be made under the legislative provisions of the Fisheries (South Island Customary Fishing) Regulations 1999 and the Kaikoura (Te Tai o Marokura) Marine Management Act 2014 ss 21-25.

[234] Lock and Leslie (2007), above n 41, at [4.8.3.1].

[235] Although there are a series of legal steps necessary to lawfully establish a mātaitai the process is considered to be shorter than for establishing a taiapure, see *Laws of New Zealand* Fisheries (online ed) at [150]. See further a summary of area management tools at <www.mahingakai.org.nz/resources/what-are-amts/>.

[236] See Nigel Scott "Area Management Tool Guidebook" (2014) at <www.mahingakai.org.nz>.

involvement by the wider community in the management or control of a mātaitai once it is established.[237] The customary guardians of a mātaitai may make bylaws pertaining to the reserve that apply generally to all persons fishing in the mātaitai reserve.[238] Bylaws may impose restrictions or prohibitions relating to all or any species, quantity, size, method, area and any other matter the guardian considers necessary for the sustainable utilisation of fisheries resources in the mātaitai reserve.[239] A mātaitai does not affect physical access to the foreshore or coastal areas.[240] In 2019, there were 1l mātaitai reserves in the North Island and 35 in the South Island.[241]

Information requirements for mātaitai record-keeping and reporting[242] are similar to those for customary fishing authorised by customary guardians in taiāpure: "every tangata kaitiaki/tiaki appointed under these regulations must keep accurate records of every [customary fishing] authorisation granted, and the records must specify full particulars of that authorisation".[243] "Accurate records of the species and quantities of fisheries resources taken by those persons authorised [by guardians] to take fish, aquatic life, or seaweed" must be kept.[244] Either "proof" or "details" must be in the possession of anyone authorised to carry out these activities.[245] Further mātaitai-specific reporting requirements state "on the last day of January, March, June, and September in every calendar year, every [customary guardian] appointed under these regulations must provide to such person, as is agreed between the tangata whenua and the Ministry, copies of every record kept by the [customary guardian …] for the preceding 3 months".[246] Annual reporting requirements of guardians to tangata whenua must report on:[247]

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[237] The Minister of Fisheries may become involved if concerns about sustainable management arise, Fisheries (Kaimoana Customary Fishing) Regulations 1998 cls 33 and 34.

[238] Fisheries (Kaimoana Customary Fishing) Regulations 1998 cl 28(3). Bylaws only apply to customary and recreational fishing, and commercial fishing is typically banned within the mātaitai reserve itself.

[239] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 28(2)(1).

[240] Fisheries Act 1996 s 186.

[241] See at Fisheries New Zealand <www.fisheries.govt.nz/law-and-policy/Māori-customary-fishing/managing-customary-fisheries/customary-fisheries-management-areas/>. Note that of the South Island mātaitai especially, a number of these pertain to fresh-water fisheries.

[242] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 35 – 41.

[243] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 35.

[244] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 36.

[245] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 37(1) and (2); this provides for written and/or oral authorisations, see clause 11(4).

[246] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 39.

[247] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cl 40(1).

(a) the administration of these regulations by the Tangata Kaitiaki/Tiaki within the customary food gathering area/rohe moana; and
(b) the number of authorisations granted for the period, including those granted for the purpose of sustaining the functions of the marae, and the species and quantities of each species for which authorisations were granted; and
(c) any restrictions or prohibitions in force for that period; and
(d) the number of mātaitai reserves and other places of customary food gathering importance in the area/rohe moana of the tangata whenua; and
(e) any other matters relevant to the effective management of customary food gathering by the Tangata Kaitiaki/Tiaki.

Offences and penalties relate to: the taking of fisheries resources without authorisation; possessing fisheries resources without approval or authorisation; the altering of an authorisation; and the breach of any bylaws made for the mātaitai reserve.[248]

3 Customary Fishing Regulation – A Role for Discourse Analysis in Regulation Analysis?

In 1999, the Parliamentary Commissioner for the Environment (PCE) highlighted tangata whenua concerns about the administrative systems and provisions for Te Tiriti rights in fisheries and marine environmental management and the extent to which they provide appropriate management frameworks to ensure the expression of kaitiakitanga and the ongoing viability of marine taonga.[249] The PCE noted that the statutory separation of Māori commercial development rights from customary or subsistence use of fisheries resources—a crucial distinction made by the Crown since the 1880s in various statutes—was an ongoing concern.[250]

Noting this concern and the essentially unchanged statutory scheme since that time, this part refers to the regulation-making process of the Fisheries (Kaimoana Customary Fishing) Regulations 1998 and to the uptake of the resulting regulatory information provisions for customary fishing; requirements for both the setting up of mātaitai reserves and information requirements about customary fishing activity (described above). The current analysis is made because there are many suggestions in the literature that customary fishing provisions are either failing to live up to their potential or, more seriously, are fundamentally flawed.[251] While

[248] Fisheries (Kaimoana Customary Fishing) Regulations 1989 cls 41 – 46.

[249] Parliamentary Commissioner for the Environment (1999), above n 54, at [3.8.3]; see also Department of Conservation *Draft Biodiversity Strategy* (discussion document, August 2019) at 43 regarding concern over legislative blocks preventing exercise of kaitiakitanga in a biodiversity management context.

[250] Parliamentary Commissioner for the Environment (1999), above n 54, at [4.3.2].

[251] See for example, Boast (1999), above n 5; Stephanie Milroy "The Māori Fishing Settlement and the Loss of Rangātiratanga" (2000) 8 WLR 63-85 at 81; Fiona McCormack "Fish is My Daily Bread: Owning and Transacting in Maori Fisheries" (2010) 20 Anthropological Forum 1, 19-39; and Margaret Mutu "The Sea I Never Gave" in

Joseph and others suggest customary fisheries provisions have potential to be positively utilised by Māori, they note the process of establishing customary fishing management areas and bylaws are "heavily scrutinised" and "controlled in many respects by the Minister of Fisheries".[252] They explain "this undermines tribal rangātiratanga and mana whakahaere totika [Māori governance jurisdiction] as originally envisioned in Treaty of Waitangi and early statutory provisions such as s 71 of the Constitution Act 1852".[253] This part of the thesis therefore suggests that discourse analysis within Black's regulation analysis framework has potential to reveal insights about the efficacy of information requirements in customary fisheries regulations and whether they embody "ideal legal characteristics". Reference is also made to alternative customary fisheries management processes and marine research as examples external to statutory and regulatory customary fisheries management processes, alternatives which provide scope for rangātiratanga.[254] These alternatives are the Ahu Moana co-management concept developed under Hauraki Gulf's marine spatial planning process, *Sea Change Tai Timu Tai Pari*;[255] the increasing voluntary observance, and later official recognition, of recent rāhui (fishery restriction/protection) placed by tangata whenua (at Waiheke Island and Coromandel);[256] and research projects carried out by the government-funded National Science Challenge, *Sustainable Seas*.[257]

Nicola R Wheen and Janine Hayward (eds)*Treaty of Waitangi Settlements* (Bridget Williams Books Ltd, Wellington, New Zealand 2012). See also *The Fisheries Settlement Report*, above n 63, regarding abrogation of customary fishing rights under Settlement Legislation.

[252] Robert Joseph and others *Stemming the Colonial Tide – Shared Māori Governance Jurisdiction and Ecosystem-Based Management over the Marine and Coastal Seascape in Aotearoa New Zealand – Possible Ways Forward* (National Science Challenges, Sustainable Seas research prepared by the Māori and Indigenous Governance Centre, Te Piringa – Faculty of Law, University of Waikato, 2020) at 148 and 495.

[253] At 495.

[254] Fisheries Act 1996 s 174 says the object of the Act's customary fishing provisions (including subsidiary regulations) is "to make better provision for the recognition of rangātiratanga and of the right secured in relation to fisheries by Article II of the Treaty of Waitangi".

[255] Raewyn Peart "Sea Change Tai Timu Tai Pari: Addressing Catchment and Marine issues in an Integrated Marine Spatial Planning Process" (2019) 29 Aquatic Conserv: Mar Freshw Ecosyst. 1561–1573; Waikato Regional Council *Sea Change Tai Timu Tai Pari: Hauraki Gulf Marine Spatial Plan* (2017); and Department of Conservation, Fisheries New Zealand, and Ministry for Primary Industries *Revitalising the Gulf: Government Action on the Sea Change Plan* (June 2021) at [5.7].

[256] See Te Aorewa Rolleston "Two-year Rahui for Waiheke Island Waters to Protect Kaimoana" *New Zealand Herald* (31 January 2021); and Sharnae Hope "Rahui Imposed on Coromandel Scallop Fishery after Years of Over Fishing" *Stuff New Zealand* (17 December 2020). See also Craig Ashworth "Taranaki Hapu Want Legal Kaimoana Ban for at Least Two Years" *Radio New Zealand News* (9 March 2022).

[257] Ministry of Business, Innovation and Employment, National Science Challenges *Sustainable Seas Ko nga Moana Whakauka* at <www.mbie.govt.nz> and <www.sustainableseaschallenge.co.nz>.

Commenting on the nature of the Māori fisheries Treaty Settlement Process and the privatisation of fishing rights, legal historian and natural resources law professor, Boast identified:[258]

> Events since 1986 form a fairly astonishing saga, demonstrating if nothing else the propensity of the New Zealand politico-legal system to create elaborate edifices of statute based on the fairly slender foundations of political deals. If there is an Adriane's thread through the labyrinth, it is the importance of the political and pragmatic as opposed to the legal and constitutional. In fact, the main legal and constitutional questions surrounding the whole notion of "Māori fisheries" have never been resolved, and, what is more, elaborate precautions have now been taken to ensure that they never will be.

The elaborate precautions were the Treaty Settlement legislation and resulting customary fishing regulations.[259] Boast's perceptions provide context to start analysis of information requirements in customary fishing regulations using Black's contributions because Boast emphasises the human, political endeavour of natural resource law and regulation-making, a space where conversations take place.[260] Black's legitimacy criteria for regulatory conversations regarding "the distribution of power and authority between conversants" and "the nature of opportunities for others to access the conversation" are borne in mind within this analysis.

3.1 Why Discourse Analysis?

Black builds on her regulatory conversation framework with specific reference to the utility of discourse analysis and its potential application and asks: "Why discourse analysis?":[261]

> Discourse analysis, the study of the use of language and communication, suggests that such interactions [regulatory conversations] are constitutive of the regulatory process, that they serve important functions, that they can be the basis of co-ordinated action, and that they are important sites of conflict and contestation. […] It is argued that examining regulation through this perspective may draw attention to aspects of the regulatory process that are as yet relatively unexplored, and provide a theoretical frame in which to place observations that have already been noted in empirical research, but which are

[258] Boast (1999), above n 5, at 111-112.

[259] Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 s 10.

[260] The politico-legal loomed particularly large in the case of Māori Fisheries Settlement legislation and regulation due to: official recognition of the decades-long grievance by Māori regarding their fisheries rights; the potential privatisation of fisheries rights precluding them as a source of redress for Māori grievance claims; and due to the presumed superiority of economic theory and neoliberalism to solve fisheries management challenges (challenges, which assumed Māori fisheries rights as guaranteed under the Treaty only pertained to customary or subsistence rights). See also Munro (1994), above n 19.

[261] Julia Black "Regulatory Conversations" (2002) 29 Journal of Law and Society: New Directions in Regulatory Theory (1) at 163 and 164.

> under-theorized. In other words, it may help us to see what we have not already seen, and understand better what it is we have.

To understand the role played by regulatory conversations, it is important to "disaggregate the regulatory process" and to identify at which points regulatory conversations occur, between whom and about what.[262] In this context, a disaggregation of the customary fisheries regulatory process includes the events that led to the regulation's creation, including regulation drafting and who was involved in this process. As seen, particular techniques of regulation such as strategies of co-regulation are themselves based on conversations in which various stakeholders produce principles, rules or standards or jointly monitor and enforce regulation under the auspices of the state.[263] The customary fisheries regulations include these aspects, as did the regulation-drafting process following the fisheries Te Tiriti Settlement.

Black outlines five central contentions in discourse theory and suggests what implications they may have for regulatory theory and practice. The contentions are:[264]

1. Communicative interactions produce meaning, coordination, and action
2. Communicative interactions create identities
3. There is a relationship to be explored between language, thought, and knowledge
4. Language is intimately related to power, and
5. Meaning, identities, knowledge, and power are open to contestation and change

While it is not the purpose of this part to explore these contentions at length, Black's core insights about them are useful in better understanding the efficacy of legal requirements for information in customary fisheries management. This research argues that the search for optimal, legal characteristics for information requirements in natural resource law needs investigation of and engagement with principal participants' identity formation, values and knowledge creation.

3.1.1

Contention one (the production of meaning, coordination and action through communicative interactions) has significant potential for understanding regulatory processes and is relevant to the present analysis because:[265]

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[262] At 171.

[263] At 172.

[264] At 163. (Abridged).

[265] At 175.

- it provides a theoretical ground for opposing a formalist view of rules and interpretation;
- it provides a basis for suggesting how and why inter-subjective, interpretive communities need to be created around regulatory language and regulatory practices;
- it provides a basis for understanding how certainty as to language and practices might be produced; and
- develops (from these insights), the coordination required for the production of inter-subjective meaning which forms the basis for action by those involved in the regulatory process.

3.1.2

Regarding the second contention that communicative interactions position actors and constitute identities, Black notes: [266]

> [The] identity constituted is not a relatively fixed end product, rather that it is always open and shifting depending upon the positions *made available* in one's own and others' different discursive practices, and within those practices the stories through which sense is made of one's own and each other's lives.

Identity matters because it affects how individuals and organisations are viewed—and thus responses to them—and because it affects action such as agenda setting or policy positioning.[267] What relevance does the interactive production of identities and positions actually have for regulation? Black suggests they have a theoretical and practical relevance, but that these have both been "absent from mainstream regulatory literature".[268]

The Māori fisheries Treaty Settlement suffered a difficult birth and conflict and compromise have been dominant characteristics of its life since then.[269] The drafting of the customary fishing regulations (North Island) was also a lengthy and contentious process.[270] Professor of Anthropology, Margaret Mutu explains the steps taken (the communicative interactions) by Māori and the Ministry of Agriculture and Fisheries (MAF) in the drafting of North Island customary fisheries regulations after the Treaty of Waitangi (Fisheries Claims) Settlement Act

[266] At 183. Emphasis added.

[267] At 183.

[268] At 185.

[269] Milroy (2000), above n 251, at 63. See also Munro (1994), above n 19.

[270] PA Memon, B Sheeran and T Ririnui "Strategies for Rebuilding Closer Links between Local Indigenous Communities and Their Customary Fisheries in Aotearoa/New Zealand" (2003) 8 Local Environment 2 205-219 at 210.

1992.[271] From Mutu's summary, one observes the "identity" the MAF created (or affirmed) for itself and the identity MAF attempted to create for customary rights holders. The present research argues that the MAF's "identity creation" has had lasting implications for the uptake and application of customary fishing regulations (North Island).[272] On the other hand, the South Island customary fishing regulations were agreed on between the Crown and Ngai Tahu (the largest tribe in the South Island) in association with a number of smaller South Island tribes earlier than North Island Māori agreed theirs. Hence, the Crown's settlement offer to Ngai Tahu for commercial fisheries provided impetus for their completion.[273] Ngai Tahu negotiated directly with the Minister for Treaty Negotiations and "secured a better set of customary fisheries regulations",[274] as may be evidenced by the fact that the South Island has 35 mātaitai reserves compared to the North Island's 11. The MAF's decision to unilaterally terminate negotiations on the North Island regulations and issue its own set of regulations can be viewed not only as a breach of the Crown's duty of good faith, but as deliberate, unilateral "identity creating" in order to assert and cement its authority over customary regulation-making and its authority in law as the final arbiter of rule-making for customary fishing. Milroy contends that in essence the Fisheries Settlement consultation and negotiations were carried out in a way which brought to mind classic "divide and rule" strategies which have caused "ongoing strife" for Māori. [275]

Jackson examined historical fisheries legislation in New Zealand from 1840 against contemporary fisheries provisions through discursive analysis.[276] She found that, although contemporary provisions were created to better provide for rangātiratanga, Māori fishing rights continue to be eroded. Focusing on the taiāpure provisions, Jackson argues that the taiāpure

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[271] Margaret Mutu (2012), above n 251, at 114-123.

[272] More generally regarding the links between contemporary politics and historical and anthropological analysis of the Treaty Settlement Process see Richard Boast "Negotiations for Reconciliation: How They Can Exacerbate Division as Well as Promote Reconciliation" in Peter Adds, Breigetter Bonisch-Brednich, Richard S Hill, and Graeme Whimp (eds) *Reconciliation, Representation and Indigeneity: 'Biculturalism' in Aotearoa New Zealand* (Universitatsverlag Winter GmbH Heidelberg, Germany 2016).

[273] Memon, Sheeran and Ririnui (2010), above n 270, at 210.

[274] South Island Iwi, Ngai Tahu, had advantages in reaching its customary fishing outcome as it had already negotiated a Treaty Settlement for itself in the settlement of its commercial fisheries rights, and did not have the challenges associated with a multi tribal base, as occurs in the North Island.

[275] Milroy (2000), above n 251, at 70 and 81.

[276] Anne-Marie Jackson "Towards Understanding Indigenous Knowledge in Environmental Management Practise: A Discursive Analysis of the East Otago Taiapure Proposal" (2008) MAI Review 1. See also Anne-Marie Jackson "Erosion of Māori Fishing Rights in Customary Fisheries Management" (2013) 21 WLR 59; and Anne-Marie Jackson "Kaupapa Māori Theory and Critical Discourse Analysis: Transformation and Social Change" (2015) 11 International Journal of Indigenous Peoples 3.

legislation is based on historical discourses that restricted Māori fishing rights. Although Jackson's discourse analysis focused on the content of legal provisions (primarily the Treaty or "savings provisions") rather than on the legislation-making process or information provisions, the fact that her analysis spans more than 150 years of legislation provides a breadth of insight and the historical background for understanding both the identity creation/affirming of the Te Tiriti Settlement regulation-making process as described above and understanding of the efficacy (or otherwise) of current information provisions for customary fisheries management.

3.1.3

Black simplifies the third contention concerning the relationship between language, thought and knowledge by stating: "the notion that regulatory conversations produce knowledge is simply a different way of stating that they build meaning".[277] Conversations are the sites where particular sets of knowledge and skills are invested with or divested of meaning and significance. In particular, the successful acquisition and dissemination of knowledge and skills is dependent on the trust that conversants have in one another and the respect they have for the person giving the knowledge.[278] Black notes that the dialogic (and polylogic) formation of spaces in which concepts can be constructed, knowledge created, issues and problems defined and cooperation facilitated is well illustrated and well theorised in Hajer's[279] analysis of the role of "storylines" in environmental regulation:[280]

> He notes that debates in environmental policy and regulation are characterized by a high degree of discursive complexity. Discussions of 'acid rain', for example, draw on the knowledges of a variety of disciplines: natural sciences, accounting, economics, engineering, and philosophy. Each discipline contributes its own knowledge; however that knowledge is not shared by others in other disciplines. The 'communicative miracle' of environmental politics, Hajer observes, is that despite the various modes of speech and sets of knowledge that are involved, conversants somehow seem to understand each other.

[277] Black (2002), above n 261, at 187.

[278] At 187.

[279] Maarten Hajer *The Politics of Environmental Discourse* (Oxford University Press, 1995). See also Richard Le Heron and others "Improving Fisheries Management in New Zealand: Developing Dialogue between Fisheries Science and Management (FSM) and Ecosystem Science and Management (ESM)" (2008) Geoforum 36; the authors note that improved dialogue on fisheries questions is likely to be most expeditiously advanced by studies that explicitly conceptualise and contextualise ecological and socio-economic processes and their institutional arrangements.

[280] Black (2002), above n 261, at 188.

The present study suggests that storylines which are (more or less) comprehended by all stakeholders in fisheries management include for example terms such as "ocean acidification" or "global warming". However, the storylines which stakeholders may perceive as implying a need to relinquish something (usually, but not necessarily, a tangible interest), storylines such as "commercial fisheries", "sustainable fish stocks", "recreational interests" or "customary rights" do not have the effect of producing the same degree of "communicative miracle" as do those where the story is perceived as an equal threat/benefit to all.

However, when storylines work well, they allow different actors to expand their own understandings and discursive competence of the phenomenon beyond their own set of knowledge. Thus, epistemic communities (as networks of knowledge-based communities with an authoritative claim to policy-relevant knowledge within their domain of expertise) are characterised by shared values or principled beliefs as to the normative rationales for social action, shared understandings of the nature of a problem and of the causal linkages between possible policy actions and desired outcomes.[281] Discourse analysis, Black determines, may rehabilitate the role of knowledge and ideas in regulation.

Where FNZ management may experience the tensions and clashes in values of fisheries users as "wicked problems"[282] or where for historical, legal or other reasons iwi or hapu cannot further manifest or develop their customary rights interests, it is arguable that the role of knowledge and ideas in fisheries management *needs* rehabilitation within a process which might be quite different to—and have advantages unavailable through—a formalistic legal analysis of rules and interpretation and of what may/may not be adjudicated (see contention one).

The Hauraki Gulf's *Sea Change Tia Timu Tia Pari* (*Sea Change*) marine spatial planning process (2013–2016) developed to support the statutory goals of the Hauraki Gulf Marine Park Act 2000 was a community-led, experimental and innovative project drawing on a co-governance and collaborative approach to natural resource management involving multiple

[281] At 189.

[282] HWJ Rittel and MM Webber "Dilemmas in a General Theory of Planning" (1973) 4 Policy Sciences 155-169.

stakeholders.[283] The project had and continues to have central and local government support.[284] Co-governance was built on an equal partnership between government and iwi in the form of a project steering group. A core impetus for the project was Māori cultural aspirations for the management of the area. The planning process therefore involved science-based knowledge as well as mātauranga Māori (indigenous knowledge systems). Under *Sea Change* the Ahu Moana co-management concept was a novel proposal. It was created within the project for near-shore management areas to help strengthen customary practices associated with the marine space and to more effectively control marine harvests. Co-management by Māori mana whenua and local communities was adopted to mobilise and focus the energy and knowledge of these groups towards improving the management of local fisheries and inshore coastal waters. Two Ahu Moana pilot projects within the Hauraki Gulf are supported by central government and a cross-agency strategy for Ahu Moana. Their intentions are: to work with mana whenua and local communities; to identify collaborative management principles that help deliver local outcomes; and "to work with iwi to review and improve existing statutory customary fisheries tools and their supporting processes".[285] The pilot projects are to inform the development of an Ahu Moana framework to streamline future Ahu Moana projects nationally. In supporting this approach, the Department of Conservation, FNZ and MPI conceded that "some of the existing planning, statutory and legislative arrangements, and their supporting processes, are not working effectively for some iwi".[286]

Two notable aspects of the Ahu Moana concept are relevant for this study. First, the concept and process were community- and mana whenua-led and, although it supported overarching statutory goals for management of the area, the process and outcomes are novel. Secondly, it created its own aspirations and working principles with wide community and stakeholder involvement and cross-agency local and central government support. Both these aspects contrast with the customary fisheries area management tool (AMT) processes provided under the fisheries regulations and Fisheries Act and with their rigid and drawn-out accompanying

[283] See Peart (2019), above n 255. Note although allocation and access to fisheries is managed under fisheries regime the RMA 1991 has primacy in controlling the interaction of fishing with other coastal activities, see Edmonds (2015), above n 32, at [10.9.1]. See further in see *Attorney-General v The Trustees of the Motiti Rohe Moana Trust* [2019] NZCA 532.

[284] For current government strategy regarding *Sea Change* see Cabinet Paper "Revitalising the Hauraki Gulf – Government Sea Change Strategy" (2 July 2021).

[285] Department of Conservation, Fisheries New Zealand, and Ministry for Primary Industries *Revitalising the Gulf: Government Action on the Sea Change Plan* (June 2021) at 77.

[286] At 82.

processes. In effect, the Ahu Moana concept and pilot projects may be "rehabilitating" the role of knowledge and ideas in customary fisheries management.

3.1.4

The fourth contention of discourse analysis is that language is intimately related to power. Language is marked by the values of social groups, encodes perspectives and judgements and can instantiate certain orthodoxies.[287] As mentioned in chapter two, law's role through encoding and perpetuating particular conceptions (such as a reductionist view of natural resources) is a powerful one. The relationship between discourse, power and hegemony is seen to be one in which discursive practices, events and texts arise out of and are shaped by power and ideology and struggles over them and as one in which the opacity of the relationship between discourse and society is a factor in securing power and hegemony.[288] Consider for example the obscurity of Māori rights in fisheries in legislation and policy prior to the fisheries Settlement[289] and, since, the curbing of customary rights to a non-pecuniary status for Māori through the extinguishment of Māori fishing rights with Settlement and imposed regulations (North Island).[290] Yet, how much scholarly attention does this asymmetry in power/authority typically receive?

Existing legal frameworks and government agencies charged with their implementation can struggle to facilitate Māori customary rights and aspirations and the complex environmental, biological and sustainability challenges in oceans and fisheries management. However, the government-funded *Sustainable Seas* developed to "enhance utilisation of our marine resources within environmental and biological constraints" supports a number of promising research initiatives, including exploring how matuaranga Māori may be better utilised in marine

[287] Black (2002), above n 261, at 190.

[288] At 190. See further Estair Van Wagner "Placing Natural Resources Law: Preliminary Thoughts on Decolonizing Teaching and Learning about People, Places, and Law" in Amanda Kennedy and others *Teaching and Learning in Environmental Law: Pedagogy, Methodology and Best Practice* (Edward Elgar Publishing, 2021).

[289] Waitangi Tribunal *Muriwhenua Fishing Report* (Wai 22, 1992) at 81, 194 and 228-229.

[290] See for example Hekia Bodwitch "Challenges for New Zealand's Individual Transferable Quota System: Processor Consolidation, Fisher Exclusion, & Māori Quota Rights" (2017) 80 Marine Policy 88-95; and McCormack (2010), above n 251.

resource decision-making.[291] *Vision Mātauranga*[292] and Māori world view are embedded across the research. For example, research projects within *Sustainable Seas* explore transdisciplinary, bicultural, socio-theoretical and socio-ecological knowledge and boundary-crossing narratives sensitised to local knowledge sources.[293] Central government *Sustainable Seas* research funding and support for *Sea Change* are a stark contrast to historical, legislative-driven, siloed approaches to fisheries and ocean management. In this respect, they have promising potential to influence improved requirements for information in natural resources law.

Black notes that conceptualisations of power and its role in regulation are underexplored in the mainstream regulatory literature and that fuller consideration of the role of power requires attention to how agendas are constructed, the conceptualisations of problems that dominate at different times, how they are manipulated and how they shift over time and space.[294] For example, how are new discursive structures such as storylines created and with what implications? Regulationists would have to consider whether power is binary or fragmented and whether or how it is created through the enrolment and mobilisation of persons, procedures and technologies to pursue a particular end. For example, "decentred regulation" involves a move away from an understanding of regulation which assumes that governments have a monopoly on the exercise of power and control.[295] Aspects of decentred regulation are already seen in commercial fisheries self-regulation (licensing and electronic reporting) and co-management (provision of industry-developed science information and extensive input in policy decision-making) and in the co-management and partial self-regulation of local fisheries under customary management tools.

The Ahu Moana initiative and more recent and geographically wider use by tangata whenua of rāhui both continue to challenge a binary concept of power in regulation. As examples, they

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[291] See Ministry of Business, Innovation and Employment, National Science Challenges *Sustainable Seas Ko nga Moana Whakauka* at <www.sustainableseaschallenge.co.nz>.

[292] Ministry of Business, Innovation and Employment *Vision Mātauranga* at <www.mbie.govt.nz>.

[293] See for example Erena Le Heron and others "Remaking Ocean Governance in Aotearoa New Zealand through Boundary-crossing Narratives about Ecosystem-based Management" (2020) 122 Marine Policy 104222; and Charlotte Sunde and Others "Valuation as destruction? The social effects of valuation processes in contested marine spaces" (2018) Marine 97 Marine Policy 170-178.

[294] Black (2002), above n 261, at 191.

[295] Julia Black "Decentering Regulation: The Role of Regulation and Self-Regulation in a 'Post-Regulatory' World" (2001) Current Legal Problems 103-146; see also Julia Black "Critical Reflections on Regulation" (2002) 27 Aust. J. of Legal Phil. 1-36; and Colin Scott "Analysing Regulatory Space: Fragmented Resources and Institutional Design" (2001) Public Law 329.

also challenge the typically bilateral nature of the natural resource bargain, for example where commercial fishing interests tend to dominate decision-making at the expense of nearshore recreational and customary fisheries interests. In 2011, Ruru and Wheen noted that voluntary rāhui (informal, non-legal restrictions) in remote locations typically have a strength of observance not seen in areas that are readily accessible to larger populations.[296] However, this may be contested by the recent voluntary rāhui placed by tangata whenua which had widespread community support and observance at the highly populated Waiheki Island and Coromandel areas, where both rāhui were subsequently officially recognised by FNZ via the Fisheries Act "temporary closure" provisions.[297] Curiously, the Fisheries Act itself does not refer to "rāhui", although the FNZ website refers to it extensively. In regulations, rāhui is mentioned only in relation to mātaitai reserves.

3.1.5

Black's final contention of discourse analysis covers contestation of meaning, identities, knowledge and power which she advocates is "the vehicle for change".[298] Within a regulatory context this contention might require attention to how problem definitions change and what the implications of such changes are.[299] Focusing on regulatory conversations from a discourse perspective has a bearing on assessments as to the "juridification" of the regulatory process. For example, if in a legally-based system of regulation the interpretation of the rules is seen in practice to lie with the regulator rather than a court, it might then be that the conversation is not marked by legal language, legal values or legal participants. That is, even though the rules being used may have legal status, there may be little juridification. In contrast, if the interpretation is seen in practice and in law to lie with a court, the matter may quickly become one in which lawyers are involved and participants in the conversation and its nature may change quite significantly. (Consider the litigiousness of Ministry decisions affecting commercial fishing, for example). Black's point has real application in an analysis of the scope

[296] Nicola Wheen and Jacinta Ruru "Providing for Rahui in the Law of Aotearoa New Zealand" (2011) 120 Journal of Polynesian Society 3, 169-182 at 177. See also Lara Taylor, Tania Te Whenua and Bonny Hatami "How Current Legislative Frameworks enable Customary Management & Ecosystem-based Management in Aotearoa New Zealand – the Contemporary Practice of Rahui" (discussion paper, National Science Challenge *Sustainable Seas*, April 2018).

[297] Fisheries Act 1996 ss 186A and 186B. See further Ministry for Primary Industries "Proposed Waiheke Island Temporary Closure" at <www.mpi.govt.nz>.

[298] Black (2002), above n 261, at 194.

[299] At 194 gives the example of the shift in financial regulation to the definition of the regulatory problem in terms of risk rather than market failure.

and quality of customary fisheries rights, rights which *are* in fact non-justiciable under current legislation and regulations.[300] For example, the "problem definition" of customary rights changed (were extinguished) with Fisheries Settlement without the support of many Māori but with lasting implications. If Māori have no legal standing with the courts to review their customary rights expression as against the Te Tiriti guarantee, Māori are in effect twice voiceless.[301] It may be little wonder therefore that there is lack of appetite on the part of Māori for the uptake of customary regulations, the customary regulation AMT process and the information requirements under these processes. There is deep and rich epistemology associated with Māori cultural identity and tikanga and the rangātiratanga linked to their constitutional role. Where however is this reflected in current customary fisheries law and regulations? This part concludes broadly, that legal requirements for information to manage customary fisheries have a greater role to play in providing for rangātiratanga, both in reforming the regulation of fisheries and in a reformed ocean management system.

C Information Requirements for Recreational Fishers

Recreational marine fishers do not need a licence, permit or authorisation to fish. Moreover, information regarding recreational catch levels is limited. The right to fish for recreational purposes is provided for in fisheries legislation. Recreational harvest managed under the Fishing (Amateur Fishing) Regulations 2013 through the main tools of daily bag limits, species size limits, gear restrictions and some area exclusions. There is no overall harvest cap for recreational take or an obligation on recreational fishers to report their catch.[302] Instead, FNZ must rely on voluntary surveys to provide estimates of recreational catch levels. These surveys have large differences in their estimates. Since 2010, recreational charter boats are required to report the location, target species, number of fishers per trip and the number of fish caught (for a limited subset of species that excludes snapper, the most important and most caught recreational species).[303]

Ad hoc collection of information by recreational fishing organisations seems unlikely to provide reliable data except in very small communities where the majority of amateur fishers

[300] Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 s 10(d).

[301] See generally *The Fisheries Settlement Report* (1992), above n 63, and at [6.1].

[302] Peart (2018), above n 195, at 29.

[303] Bess (2016), above n 38, at 30 and 58.

are known to each other, act as a collective and have an incentive to report their catch.[304] In some cases, such data has informed fisheries management. Potential and existing self-reporting tools for recreational fishers are being reviewed. However, there are huge challenges with self-reporting despite sophisticated, emerging technologies such as smartphone apps to record catch. The likelihood of all fishers reliably participating in a self-reporting regime is very low and survey methods will always be required to estimate the catch landed from a fishery.[305] Bess suggests that because successive governments have failed to improve recreational fisheries management, recreational fishing management remains largely hands-off, with the few regulated controls often ineffective in constraining recreational fishing efforts and catch.[306] However, due to the large role that recreational fishers have in shared fisheries, their greater involvement in the management of fisheries is warranted[307] and research to explore the application of regulation theory and discourse analysis in the recreational fishing context is warranted.

D Regulator Information Requirements

One might assume that with a complex, dynamic, natural resource such as marine fisheries governing legislation would place emphasis on the duty of the regulator to gather information and to conduct scientific research to ensure the dual purpose of the Act is fulfilled (utilisation of fisheries resources while ensuring sustainability). Strikingly however, there is nothing in the Act which explicitly requires the Ministry to gather information or to conduct research; nor is there any reference in the environmental or information principles of the Fisheries Act to research, research quality or to maintaining an adequate research base.[308] Indeed, while sustainable utilisation is an overriding purpose of the Act, the Act contains no guidelines that link the broad goal of sustainable utilisation and the specific allocation-related details outlined in the remainder of the Act. There is no link between the goal to "maximise the value New Zealanders obtain through the sustainable use of fisheries resources and protection of the

[304] Environmental Defence Society (2016), above n 132, at 7.

[305] Bess (2016), above n 38, at 64. Black (2002), above n 261, at 178-179, notes that where the authority of law is not respected, or where regulation is not using law, and in the absence of an analogous authority-bearing mediating institution then it may be that a deeper normative commitment to the goals and values of the regulatory process is required for its effectiveness.

[306] Bess (2016), above n 38, at 7.

[307] Lock and Leslie (2007), above n 41, at [5.3.3.7]. Parliamentary Commissioner for the Environment (1999), above n 54, at [4.4].

[308] Fisheries Act ss 9 and 10.

aquatic environment" and all the outputs and activities undertaken by the Ministry.[309] Weak research requirements were considered problematic under the Fisheries Act 1983 and were a primary concern in a review of the QMS by the PCE and the Auditor General in 1989.[310] The Fisheries Act 1996 provided for the establishment of a National Fisheries Advisory Council "to advise the Minister on any matter from time to time determined by the Minister for the purpose of this Act", where the Minister may authorise the Council "to make such inquiries, conduct such research, and make such reports, as may assist the Council in advising the Minister."[311] No such Council has ever been established, though it has been proposed.[312] Although fisheries management plans may be developed under the Act, they are not compulsory and no detail is given for how they should be carried out and maintained.[313] The scope, role and content of fisheries plans along with the process to develop them remain a largely contested issue.[314]

Noting the Act's silence on research requirements, the final parts of this chapter explore FNZ's science research management and processes, who has input into fisheries science research and the role of informal (non-legal) science "standards". These include the *Harvest Strategy Standard for New Zealand Fisheries* (2008) and the *Research and Science Information Standard for New Zealand Fisheries* (2011).[315]

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[309] Lock and Leslie (2007), above n 41, at [8.2.1].

[310] *Marine Fisheries Management* (1990), above n 66, at [917]. See also Quin (1997), above n 20, 503 and 524.

[311] Fisheries Act 1996 Part 15 Fisheries Administration s 276(2) and (3)(c). See also Ministry of Agriculture and Fisheries Restructuring Act 1995 s 21(1), the Minister of Fisheries has power to appoint from time to time advisory or technical committees and to define the functions of any such committee. These committes are now known as "Science Working Groups" (SWGs), see further below.

[312] Fisheries New Zealand *Future of our Fisheries: Integrated Electronic Monitoring and Reporting System* (Vol III, November 2016) at 21. Primary Production Committee Report on the Fisheries Bill (1996) at [xxxv] discusses the purposes of a National Advisory Fisheries Council: "the credibility of this body will depend on its ability to give impartial, independent, expert advice." See also Randal Bess "Public management in New Zealand and its effect on institutional arrangements for managing fisheries" (2012) 36 Marine Policy 550 at [3.5] regarding the then-touted "Marine Department" to consolidate a range of marine activities scattered across departments.

[313] Fisheries Act 1996 ss 11 and 11A.

[314] Peart (2018), above n 195, at 128; and at 128-132 Peart reviews fisheries plans from 1983—2018. See also recommendations by the Environmental Defence Society to strengthen the use of fisheries plans in Severinsen, Peart and Rollinson *Breaking Wave* (2021), above n 85, at 109-110. See further, Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021) at 45, 153-156, and 199.

[315] Fisheries New Zealand *Harvest Strategy Standard for New Zealand Fisheries* (October 2008); and Fisheries New Zealand *Research and Science Information Standard for New Zealand Fisheries* (April 2011).

V *Fisheries Science Research Funding and Processes*

While fisheries science has evolved in line with that in much of the rest of the developed world, the perceived value of scientific research in New Zealand has varied considerably across fisheries due (at least in part) to the way in which it is funded.[316] Since the late-1990s, attempts by government to minimise expenditure on fisheries research have arisen largely on the grounds of attributable costs. Devolution of services, research tendering and attributable costs can be seen as an extension of neoliberal economic reform.

Central government provides budgetary support for fisheries research and the commercial fishing sector contributes to research costs through cost-recovery fees.[317] Apart from cost-recovery fees resource royalties or rents are not charged for commercial fishing.[318] Fisheries cost recovery is controversial, and conflict has always surrounded the role of industry in funding research.[319] Concerns within the fisheries industry suggest that the return on research investment may not be worth the money spent. The industry levy funds vital data gathering and research for significant commercial fish species, but does not fund basic public good research or research valuable for other fished species.[320] A 2021 review of commercial fisheries science and research processes found that the industry levy creates a resourcing shortfall, unreasonable expectations on the funding, and a lack of trust and perverse incentives.[321]

The Fisheries Amendment Act 1999 delegated important regulatory responsibilities to approved "service delivery organisations" (commonly known as commercial stakeholder organisations or CSOs).[322] Many registry-based services were devolved to CSO, New Zealand

[316] Pamela Mace, Kevin Sullivan, and Martin Cryer "The Evolution of New Zealand's Fisheries Science and Management under ITQs" (2014) 71 ICES Journal of Marine Science 2, at 209 and 212.

[317] Fisheries Act 1996 ss 261-267. See further Michael Harte "Funding Commercial Fisheries Management: Lessons from New Zealand" (2007) 31 Marine Policy 379.

[318] Mace, Sullivan and Cryer (2014), above n 316, at 204. Note the original "resource rental levy" of the ITQ system was changed to a "cost recovery fee" in 1994.

[319] Lock and Leslie (2007), above n 41, at [6.2.1.1].

[320] Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021) at 6. Compare this with commercial fishing industry feedback concerning fisheries and conservation services levies in Ministry for Primary Industries, Cabinet Paper "Fisheries and Conservation Services Levy Orders 2021/2022" (14 October 2021) at [14]. The Fisheries Act 1996 s 262 cost recovery principles limit what conservation costs may be recovered from industry and is shaped by a "user-pays" principle.

[321] Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021) at 6.

[322] Fisheries Act 1996 s 2 and Part 15A performance of services by approved organisations.

Seafood Industry Council (SeaFIC).[323] SeaFIC's subsidiary, Commercial Fisheries Services, operates as FishServe. Fishserve duties and powers include registering commercial fisheries clients and vessels; licencing fish receivers; issuing catch return books and operating returns management processes including electronic data transfer for statutory reporting; processing quota and annual catch entitlement transactions; and reconciliation of fishers' actual catches against their catch entitlements.[324]

The 1999 amendment also provided for direct purchasing of research. Initially, fisheries science research was mostly conducted in-house by FNZ.[325] Now FNZ is the prime manager of fisheries information in New Zealand where the Science and Information Directorate determines research needs and facilitates the development and procurement of research projects.[326] The Directorate provides expert guidance and review of research projects through Fisheries Assessment Working Groups (SWGs), and annually reports on the state of fish stocks and effects of fishing on the environment. The Directorate also facilitates data archiving and interacts with Fishserve.

Today, science information used in fisheries management and fisheries policy decisions is contracted and conducted almost exclusively outside of government departments.[327] The main provider of fisheries research (resource surveys, catch monitoring and stock assessment research) for New Zealand fisheries is the National Institute of Water and Atmospheric research (NIWA).[328] Due to New Zealand's small population size and the limited funding for fisheries research only a few small niche providers have entered the research market; in fact, it is

[323] SeaFIC represents the interests of the seafood industry and is a limited liability company owned by commercial fisher organisations; see Michael Harte "Opportunities and Barriers for Industry-led Research" (2001) 25 Marine Policy 159. For a concise summary of fisheries stakeholder groups, see *Laws of New Zealand* (online ed) Fisheries at [3]; and for an overview of the largest quota holder companies and the power of collective action in the commercial fishing sector, see Rees (2005), above n 26, at 147-231.

[324] Harte (2001), above, at [5].

[325] Ministry of Agriculture and Fisheries (Restructuring) Act 1995.

[326] Glen Carbines in Severinsen, Peart and Rollinson *Breaking Wave* (2021), above n 85, at 171.

[327] Pamela Mace and Andrew Penney "Overview of New Zealand's Fisheries Science Peer Review Processes" (Fisheries NZ, 10 June 2010) at 4. Fisheries NZ may also contract research to other government agencies such as the Department of Conservation, and works collaboratively with agencies to align research plans and peer review processes. Some research is directly conducted or contracted by industry, academic institutions or environmental non-governmental organisations. Such research either results from a collaborative research planning processes between the Ministry and industry or is contracted entirely independently by stakeholder or other interested organisations.

[328] NIWA was formed under the Crown Research Institutes Act 1992.

arguable that a "research market" does not really exist.[329] The devolution of significant management and regulatory responsibilities, and crucial decision-making for marine environmental research, to the commercial fishing sector has engendered acrimonious public debate between industry representatives, the Minister, the scientific community and environmental NGOs.[330] Fisheries literature points to the hollowing out of public sector expertise and reliance on experts who have developed their careers by working for one of the key science and policy information providers.[331] This means "independent experts" either share detailed insider knowledge of apparently competing approaches from competing service providers or share the same perspective even though working for apparently independent institutions.[332]

Fishers and fishing companies aim to maintain or increase profits, essentially by either increasing revenues or decreasing costs; and, given the overall lack of scope for increasing revenues through sustainable increases in catches, cost-recovery research has frequently been perceived as a target for decreasing costs.[333] Industry members often contend that the research is not needed or that it is unaffordable, and as a result most fish species have received little if any research attention for many years. This is particularly a problem for research to determine stocks most at risk and for which TAC reductions are most likely.[334] Added to this, the overall fisheries research budget has decreased considerably to ~50 per cent of the level of the early 1990s in real terms, and concomitantly, the number of fish species and stocks in the QMS has increased 3.5-fold.[335] Insistence also by government and industry on market-based, contestable systems for research delivery create problems of replication of expertise and facilities,

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[329] Mace, Sullivan and Cryer (2014), above n 316, at 209. John McKoy "Fisheries Resource Knowledge, Management, and Opportunities: Has the Emperor Got No Clothes?" (NIWA, 2006) at 39.

[330] Parliamentary Commissioner for the Environment (1999), above n 54, at 2.

[331] For example, the FNZ policy team has transitioned from approx. 35 people to fewer than 5 who are dedicated to fisheries issues. In total, several hundred years of experience in fisheries management has ceased being part of Ministry for Primary Industries, Fisheries NZ; see Bess (2016), above n 38, at 71.

[332] Gordon Winder "Context and Challenges: The Limited 'Success' of the Aotearoa/New Zealand Fisheries Experiment, 1986 – 2016" in Gordon M Winder (ed) *Fisheries, Quota Management and Quota Transfer: Rationalization through Bio-economics"* (Springer, 2018) at 88.

[333] Mace, Sullivan and Cryer (2014), above n 316, at 209.

[334] McKoy (2006), above n 329, at 39. Note, although the present research does not discuss it further, recommendations for the use of technical modelling and the validation of models in fisheries management are made in Office of the Prime Minister's Chief Science Advisor *Future of Commercial Fishing in Aotearoa New Zealand* (February 2021) at 288-289.

[335] Mace, Sullivan and Cryer (2014), above n 316, at 209.

reduction of cooperation and science communication.[336] The overall consequence of these arrangements for science research is that there is little effective challenging of industry-sponsored research, and a reliance by NIWA on the fishing industry.

Environmental law, science and conservation critics of the current fisheries management system argue that the system is not strongly science-based and that claims about the environmental sustainability of the current system are misguided. They argue that fisheries management under the Act must be conducted within a broader marine management framework.[337] Fisheries NZ holds that it maintains a small, strategically-focused marine biodiversity research programme "designed to have strong synergies with other marine research funded by MPI and other agencies"[338] to address several science objectives related (but not limited) to marine biodiversity, ecosystem-scale biodiversity and ocean climate effects.[339] Scientists at FNZ state that "the obligation to ensure sustainability has led to the introduction of many measures"[340] which together with fish stock management "could be considered to constitute a first-level ecosystem approach to fisheries management" and that an incremental or evolutionary approach to the implementation of ecosystem approaches is widely advocated.[341] A first-level ecosystem approach is single-species management of target resources with issues such as protected species and habitat factors incorporated into management decisions as important considerations.[342]

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[336] McKoy (2006), above n 329, at 39.

[337] At 41. See also Edwin Massey and Eugene Rees "Sustainable Utilisation of Fisheries as Governmentality: Constraining the Potential for Ecoystems-Based Management" (2005) 60 New Zealand Geographer 1 at 25; Hulme-Moir (2017), above n 109, at 230; Environmental Defence Society (2016), above n 132; and Martin Cryer, Pamela M Mace and Kevin J Sullivan "New Zealand's Ecosystem Approach to Fisheries Management" (2016) 25 Fish. Oceanogr. 1, 57-70 at 66-67.

[338] Cryer, Mace and Sullivan (2016), above n 337, at 65.

[339] At 65.

[340] At 57 and 58. "Measures" include those to deal with incidental captures of protected species (primarily marine mammals and seabirds); benthic effects caused by bottom trawl and dredge gear; changes to marine biodiversity; and the protection of habitats of particular significance for fisheries management.

[341] At 57-58 and 65. For a summary of the adequacy of environmental information for marine environmental management see, Parliamentary Commissioner for the Environment (1999), above n 54, at [5].

[342] The second-level ecosystem approach is a multi-species system-level approach including ecological and environmental factors such as trophic structure, climate anomalies or regime shifts as they influence the system; and the third-level is a comprehensive, multiple sector approach that captures the human activities and values associated with all external influences, alternative uses and impacts; see MC Holliday and AB Gautam "Developing Regional Marine Ecosystem Approaches to Management" (2005) NOAA (Tech. Mem. NMFS-F/SPO-77).

Fisheries NZ scientists consider the ecosystem-levels approach useful because levels of approach capture the essential elements as implemented at different levels.[343] However, critics contend that the first-level action by FNZ is too slow and is a result of nearly three decades of scientific contestation and environmental movement action.[344] Furthermore, there is no guarantee that a more prominent role for ecosystem science will, on its own, necessarily improve environmental outcomes. This is because, alarmingly, distinctive neoliberal tendencies see ecosystem-based integrative planning for marine and coastal areas as a vehicle to increase exploitation of resources.[345]

Fisheries science managers within the Ministry acknowledge the challenges of the QMS, stating that the designers of the QMS hypothesised that it would lead to an enhanced stewardship ethic in the fishing industry. However, many factors have challenged this hypothesis. Furthermore, a key role of fisheries science, fisheries management and the fishing industry itself since the inception of ITQs has been to address these challenges.[346] These include:[347]

- lack of consideration of natural variation in fish stocks;
- the complexity of managing multispecies fisheries;
- environmental externalities;
- a limited and diminishing research budget that cannot address the full range of species and issues;
- potential conflicts with alternative users of the marine space; and
- the various mechanisms by which quota ownership has become divorced from fishing activity.

Given these challenges, it remains difficult to see how the industry's entrenched roles in fisheries science procurement, self-regulation and its litigation-of-TAC-decisions business model along with FNZ's light-touch compliance approach help to "enhance" a stewardship ethic. It is plausible that industry simply finds greater profit in controlling these spheres than in enhancing its stewardship ethic.

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[343] Cryer, Mace and Sullivan (2016), above n 337, at 58.

[344] Cryer, Mace and Sullivan (2016); and see Winder (2018), above n 332, at 87.

[345] Gordon Winder and Richard Le Heron "Assembling a Blue Economy Moment? Geographic Engagement with Globalizing Biological-Economic Relations in Multi-Use Marine Environments" (2017) 7 Dialogues in Human Geography 1, 3-26.

[346] Mace, Sullivan and Cryer (2014), above n 316, at 212.

[347] At 212.

A Information Pathways – Access to the Conversation

The EDS commented on fisheries science information, stating that existing science information could be better used and that lack of science information underpinning the QMS generally is a serious issue and a result of long-term underinvestment.[348] While much excellent research related to the broader aquatic environment has been undertaken, the EDS found that it appears to have had little impact on fisheries management decision-making "because the pathway for its application has not been identified and adopted".[349]

Environmental and economic anthropologist, Fiona McCormack, has examined New Zealand's fisheries management sustainability, with a particular focus on the role played by neoliberalism.[350] McCormack's research offers useful insight by stepping back from the legal dimensions of fisheries management to examine the underpinnings of neoliberalism's influence on New Zealand's QMS. She suggests that there is a crucial relationship between scientific assessments of the sustainability of natural ecosystems and economic theories about future wealth. As instruments, MSY and TAC demand a distinct type of data and create a path for the type of data requested, effectively excluding other types of management tools.[351] While she acknowledges the solid corpus of literature linking ITQs with broader neoliberalisations, she notes there is little that addresses the place of sustainability in endorsing this relationship: ie the role played by neoliberally-conceived sustainability in the modelling of ITQs as the optimum economic *and* biological means through which to govern fisheries. Her focus is three-fold:[352]

1. To analyse the substance of the claim implied in [the] particular discourse of sustainability, including scientific assessments of the sustainability of harvest rates;
2. To assess the compatibility of this with the wealth generating potential of ITQs; and
3. To suggest that the 'sustainability brand' works to legitimise the privatisation and marketization of marine environments, to protect the income stream of quota investors

Each focus has relevance to information provisions under the Fisheries Act, primarily those requirements whereby TAC is set and those to manage commercial fishing under ITQ holdings.

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[348] Environmental Defence Society (2016), above n 132, at 6.

[349] At 9.

[350] McCormack (2017), above n 18, at 35-46.

[351] At 40.

[352] At 36. Note a fisheries quota management system can operate *without* the use of individual transferrable quota; see Fiona McCormack *Private Oceans: The Enclosure and Marketisation of the Seas"* (Pluto Press, London, 2017) chapters 3 and 4.

The Act's particular economically driven "asset management" emphasis also has undoubted flow-on effects in setting the information requirements for other fisheries users, customary and recreational fishers' environmental interests and opportunities for their participation.

McCormack argues QMS fisheries take two separate approaches to sustainability which are structured to reflect a nature/society distinction, with each sphere having its attendant disciplinary boundaries, expert practitioners and subjects of analyses. These divisions are reflected in:[353]

(a) The configuration of biological sustainability through assessments of stock, the total allowable catch (TAC) – the work of fisheries biologists, and
(b) The generation of social sustainability through the creation of (quasi) private property rights (ITQs) and markets – the work of fisheries economists and the subsequent field site of social scientists.

Yet, suggests McCormack, rather than conceiving of these as distinct spheres—each with its own subject area (nature or society) and disciplinary paradigm—it may be more useful to consider the linkages: ie the relationship between scientific assessments of sustainability of natural ecosystems and economic theories about future wealth derived explicitly through privatisation. The overarching interest is "not the comparative biological impact of different fisheries management systems" (a task complicated by the absence of a common methodology for assessing sustainability) "but rather to emphasise the *particular way* the QMS in New Zealand operationalizes sustainability."[354]

Massey and Rees' environmental geography research of New Zealand's fisheries management has similar findings to McCormack's: ie the QMS management framework fostered the commercial fishing industry's perception of its political place as the pre-eminent stakeholder. Through cost recovery and the commensurate "user pays–user says" ethos, commercial stakeholders promote the dominance of the commercial fishing industry in marine management. Critics of this dominance point to the lack of trust between stakeholders. Massey and Rees claim that "An endemic lack of trust is brought about by stakeholder groups espousing different understandings of sustainability; a disharmony which results from the ongoing struggle between commercial fishing interests, recreation fishers, environmental and other concerned interests."[355] Fisheries science is compelled to adopt solely an instrumental role; thus, a limited

[353] McCormack (2017), above n 18, at 36.

[354] At 36. Emphasis added.

[355] Massey and Rees (2004), above n 337, at 29. See also Wallace (1999), above n 21, at 50-52; Winder (2018), above n 332, at 85; and E Pinkerton "Groundtruthing Individual Transferable Quotas" in P Durrenberger and G

view of science reduces the capacity of scientific research to discover new unknowns. Research results have become a bulwark of commercial stakeholders' sustainability rhetoric. Additionally, provisions to challenge the applicability of current research questions remain limited, despite the weight of evidence suggesting that new unknowns will prove crucial to the viability of the marine environment in the future.[356]

B Mātauranga Māori

Fisheries NZ's incorporation of mātauranga Māori information in fisheries decision-making faces similar "pathway" challenges. The Fisheries Act definition of "information" includes "customary Māori" information;[357] however, fisheries Settlement legislation and regulations' interpretation sections do not refer to information or to different types of information.[358]

Weaving mātauranga Māori together with other approaches to science and knowledge is a work in progress for FNZ.[359] Fisheries management is not an exception in government agencies grappling with approaches and frameworks for including mātauranga Māori and te Ao Māori in environmental and natural resource management.[360] In his 2020 review of the funding and prioritisation of environmental research in New Zealand, the PCE stressed that environmental research in the New Zealand context "must embrace mātauranga Māori at the heart of its enterprise".[361]

Palsson (eds) *Gambling Debt: Iceland's Rise and Fall in the Global Economy* (University Press of Colorado, Boulder, 2015) 109-120; and E Pinkerton "The Role of Moral Economy in two British Columbia Fisheries: Confronting Neoliberal Policies" (2015) Mar Policy 61, 410-419.

[356] Massey and Rees (2004), above n 337, at 33. See also Le Heron (2008), above n 279, at [6].

[357] Fisheries Act 1996 s 2(1).

[358] Note "Iwi planning documents" within customary fishing regulations inadvertently provide an avenue for customary Maori information to be considered in decision making by FNZ; however, the regulations' overall provision for the expression of rangātiratanga in customary fisheries management may undermine the potential of Iwi planning documents; see Fisheries (Kiamoana Customary Fishing) Regulations 1998 s 16; and Fisheries (South Island Customary Fishing) Regulations 1999 s 16. See further Fisheries New Zealand "A Guide to Customary Research Proposals and Processes" (June 2021).

[359] Carbines (2021), above n 326, at 177-178.

[360] At 177. See for example Environmental Protection Authority *Partnership in Action: The EPA's Mātauranga Framework* (June 2020). See further, Ministry for the Environment *Mātauranga a Maori and the Ministry* at <www.environment.govt.nz/te-ao-maori/matauranga-maori-and-the-ministry>. See also Ministry for the Environment *New Directions for Resource Management in New Zealand* (June 2020) chapter 3.

[361] Parliamentary Commissioner for the Environment *A Review of the Funding and Prioritising of Environmental Research in New Zealand* (December 2020) at 13, see also at 49, 58, and 63.

One way FNZ seeks customary Māori information is via triannual Iwi Fisheries Forums with eight iwi across Aotearoa where each Forum has a Fisheries Plan[362] and where consultation on catch limits is a means of incorporating a tangata whenua view into fisheries management.[363] However, Carbines (and others) argue that this approach can risk retrospectively seeking Māori views:[364]

> Māori have had relatively limited opportunities to influence the science-policy interface in fisheries management. The mainstream view draws sharp boundaries between knowledge and management action, often placing experts outside of local communities. In contrast, a te ao Māori approach views knowledge and action as intertwined, and is more open to different forms of knowledge and expertise. As part of the Crown's constitutional responsibilities under te Tiriti, a significant re-think of the science-policy interface may be needed to reflect te ao Māori perspectives, aspirations and priorities. Ultimately, this needs to be led by Māori.

The Prime Minister's Chief Science Advisor's (PMCSA) 2021 report on the future of commercial fisheries (but which discussed customary fisheries practices and knowledge) made similar findings, noting that local knowledge and mātauranga Māori are currently underutilised and identifying a need for FNZ to be more sensitive to on-the-ground expertise and advice.[365] Such findings have significant implications for crafting optimal, legal characteristics for improving information requirements for expression of rangātiratanga in customary (and commercial) fisheries management. The PMCSA emphasised that "there is enormous potential to draw on mātauranga Māori" and that a long-term ecosystem approach to fisheries management should consider using existing concepts to embed te ao Māori within policy[366] and that a "bold Oceans Strategic Action Plan" could "be based on a dual framework of mātauranga Māori and western science".[367] Central government's reform agenda for fisheries

[362] Personal communication with Rose Grindley, FNZ Acting Manager Customary Fisheries (February 2022).

[363] Fisheries Act 1996 ss 11A and 12.

[364] Carbines (2021), above n 326, at 177-178. Compare also, *Te Ohu Kiamoana* commentary regarding the rationale and reliance of FNZ on Iwi Fisheries Forums and Iwi Forum Fisheries Plans in "Te Ohu Kaimoana's Specific Comments on Fisheries New Zealand's Draft Inshore Finfish Fisheries Plan" (n.d) at [11] and [48] – [50].

[365] Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021) at 2 and 28.

[366] At 28 and 29 and 38.

[367] Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand: Key Messages* (February 2021) at 22.

and ocean health has also recently affirmed the critical role of Māori in managing both the marine environment and the environmental effects of fishing.[368]

VI Fisheries Research and Science Information

Building on chapter four's review of peer review in geothermal resource regulation and in regulating resource-user compliance more broadly in New Zealand, this part explores fisheries management science processes and peer review.

In 2011, FNZ produced the *Research and Science Information Standard 2011* (the *Standard*).[369] The Ministry introduced the Standard with the statement that it would make a significant contribution to ensuring high-quality information continues to be used as a basis for New Zealand's fisheries management decisions and that it would support "the use of best available information from a range of sources" and "a precautionary approach where information is uncertain".[370] The *Standard's* provisions apply to research projects contracted by FNZ, research projects conducted or contracted by the seafood industry or other stakeholder organisations as part of agreed research programmes and any other research independently conducted or contracted, if that research is intended or likely to inform fisheries management decisions.[371] Recognising the *Standard* as an "effective and essential framework", the Ministry for Primary Industries' *Science Strategy* proclaimed that the *Standard* would be adopted across the Ministry for Primary Industries broadly "to provide guidance on reviewing science and ensuring high science quality for all relevant MPI programmes and funds" .[372]

The *Standard* is not legally binding. However, science information used to make fisheries decisions must adhere to its requirements. In developing the Standard, FNZ reviewed

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[368] See Cabinet Papers "Oceans and Fisheries Portfolio – Ensuring Healthy Ocean Ecosystems" (2 July 2021) at [20], [53.3] and [59]; and "Fisheries System Reform Agenda" (2 July 2021) at [23] and [52]-[56].

[369] Fisheries New Zealand *Research and Science Information Standard for New Zealand Fisheries* (April 2011).

[370] At 4. See also Fisheries New Zealand *Fisheries 2030 Report* (September 2009) at 12; the report's first-listed principle is an ecosystem-based approach: "We apply an ecosystem-based approach to fisheries management decision-making".

[371] Fisheries New Zealand *Research and Science Information Standard for New Zealand Fisheries* (April 2011) at 4.

[372] Ministry for Primary Industries *Science Strategy* (October 2015) at 3 and 23. Also significant is Australia's 2016 federal-level adoption of the Ministry for Primary Industries, Fisheries NZ *Research and Science Information Standard for New Zealand Fisheries* (April 2011) for Australian fisheries management; see *Research and Science Information Guidelines for Australian Fisheries* (September 2016). Note also Ministry for Business, Innovation and Employment *Draft Strategy for Research, Science and Innovation* at <www.mbie.govt.nz/have-your-say/draft-research-science-and-innovation-strategy/>.

international best practice for science quality assurance and peer review and adapted these to New Zealand requirements:[373]

> Internationally and locally there is an increasing move towards ensuring that high quality evidence is used for policy formulation and decision-making, with increasing emphasis on the need for independent peer review to ensure the relevance, integrity, objectivity and reliability of information – key principles of which have been integrated into the Standard.

Internationally, there is also progression from general guiding principles towards increasingly specific guidelines, standards and mechanisms through which to conduct peer review and evaluate the quality of scientific information.[374]

New Zealand has lagged behind other countries in developing formal, published guidelines for quality assurance of scientific information and peer review processes.[375] Despite a long-standing international foundation for the need to ensure best quality scientific information, operational definitions and *how* to ensure reliability of information have been typically absent from high-level information principles internationally. Since the early 2000s, various countries have therefore steadily supplemented overarching principles with more detailed guidelines.[376] The PCE has produced a number of reports about the relationship between science and policy and the need to improve trust in science.[377] A PCE report observed that, although New Zealand was quick to commit to the concept of sustainable development through for example the RMA 1991, there has been subsequent lagging behind of other nations due to the New Zealand tendency to view market incentives as reliable in encouraging a balance between development

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[373] Andrew Penney "Review of International Guidelines Relating to Scientific Quality Assurance and Peer Review" (Fisheries New Zealand, June 2010).

[374] At 2.

[375] Ie, an absence of formal, published guidelines within individual Ministries and across government agencies in New Zealand. Penney (2010), above n 373, at 57 notes that the public health, safety and environmental concerns of the mid-1990s which precipitated the rapid movement towards cross-government standards for quality of science in the United Kingdom and United States did not touch upon New Zealand society so there was no specific, overwhelming crisis of confidence in government decision-making analogous to eg, the mad-cow disease episode in the United Kingdom.

[376] At 5. Recent international audits and reviews on implementation of scientific quality assurance standards have expressed concern at the loss of scientific expertise in government, at 76.

[377] See for example, Parliamentary Commissioner for the Environment reports: *Key Lessons from the History of Science and Technology: Knowns and Unknowns, Breakthroughs and Cautions* (March 2001); *Illuminated or Blinded by Science? A Discussion Paper on the Role of Science in Environmental Policy and Decision-making* (July 2003); *Missing Links: Connecting Science with Environmental Policy* (September 2004); *Outcome Evaluation: Connection Science with Environmental Policy* (June 2007); and *A Review of the Funding and Prioritisation of Environmental Research in New Zealand* (December 2020).

and environmental sustainability[378] —and particularly pertinent to fisheries management— interpretations of sustainability which are narrowly focused on species management rather than the wider environmental sustainability of commercial fishing.[379]

Key principles that have emerged from international initiatives for effective scientific information quality assurance and peer review include:[380]

- definitions of information quality, including relevance, objectivity, integrity, accuracy and precision;
- specific guidelines to ensure objectivity and accuracy of various information categories;
- inclusion of appropriate and diverse technical expertise on review panels;
- scientific independence from policy and stakeholder influences;
- appropriate evaluation and full reporting of uncertainty and risk;
- transparency and openness of peer review processes;
- declaration and management of conflicts of interest;
- provision for multiple levels of peer review, appropriate to varying need for timeliness, expertise and independence, and to the availability of appropriate expertise; and
- retention of adequate in-house scientific capabilities, and training of managers and policymakers, to establish an effective science-policy interface.

Peer review which also supports information quality assurance is important for fisheries management and for geothermal resource management, as shown in chapter four. Under the international guidelines that FNZ reviewed, government departments are required to establish peer review panels or ad hoc peer review processes as and when required, to peer review and to provide quality assurance for all scientific information intended or likely to inform management or policy decision-making. The appropriate form of peer review differs between issues and situations depending on factors such as urgency or scientific advice, complexity of the information, range of expertise required for review, the extent to which methods are well-established or novel, availability of necessary expertise within departments or locally and the level of independence required.[381] The 2011 *Standard* therefore promotes peer review as the

[378] Parliamentary Commissioner for the Environment *Sustainable Development for New Zealand* (2002).

[379] See Klaus Bosselman "Property Rights and Sustainability: Can They be Reconciled?" in David Grinlinton and Prue Taylor (eds) *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (Martinus Nijoff Publishers, Netherlands, 2011); and David Grinlinton "Evolution, Adaption, and Invention: Property Rights in Natural Resources in a Changing World" in David Grinlinton and Prue Taylor (eds) *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (Martinus Nijoff Publishers, Netherlands, 2011).

[380] Penney (2010), above n 373, at 2.

[381] At 69.

primary, internationally accepted mechanism for evaluating the quality of research and science information. As such, peer review is both a principle and a mechanism.[382]

A How Fisheries NZ Uses Peer Review

Fisheries NZ Science Working Groups (SWGs) conduct peer review for fisheries research in-house. SWGs review research projects funded by FNZ's research budget. In general, data that is collected by commercial stakeholders without peer review cannot be used for management purposes unless it is presented and approved by an appropriate SWG. Novel, complex or contentious projects are subjected to science quality assurance and may be peer reviewed at various stages of the SWG process, including by external, expert reviewers. Information from SGWs can then feed into fisheries management decision-making.

Industry scientists, environmental non-governmental organisations and others may attend FNZ SWG processes, something which is seen to facilitate buy-in to processes and encourages development of consensus views on the validity and reliability of scientific results.[383] Fisheries NZ must be able to critically identify where debates may deviate from impartial, robust and reliable science. While high inclusivity encourages buy-in, it inevitably results in some degree of trade-off between the independence and impartiality of the peer review process.[384] While all technical experts involved in SWGs are expected to adopt a "hats-off" approach to meetings (ie to participate as experts who are not advocating for particular outcomes based on vested interests), advocacy is nevertheless evident in some discussions due to conflicts of interest in cases where scientific research results are likely to have significant economic or environmental impacts.

However, Carbines describes the stringent membership rules and review process under SWGs as "a barrier to the flow of information from other regulators operating in the marine environment" and suggests "remedial action may be needed to support non-commercial sector expert representation" in SWGs.[385] For example, although SWG processes allow for representation of a diverse range of interests at working group meetings, in practice attendance

[382] Fisheries New Zealand *Research and Science Information Standard for New Zealand Fisheries* (April 2011) at 6.

[383] Mace and Penney (2010), above n 327. Critics of FNZ science processes disagree with this, stating that environmental concerns are not properly addressed; nor are non-governmental agencies a formal stakeholder under the Fisheries Act 1996.

[384] Mace and Penney (2010), above n 327.

[385] Carbines (2021), above n 326, at 176-177.

is often dominated by the commercial fishing industry. The recreational, customary and environmental sectors are often poorly and infrequently represented and independent expert academics are not routinely present. One of the main constraints on the diversity of technical expertise within working groups is the inability of non-commercial sectors to financially support attendance.[386] Where this disparity in access remains unresolved, industry "advocacy" is arguably less likely to be challenged by FNZ. If stakeholder research is subject to the SWG process, this may be seen as "sufficient" for fisheries decision-making under the Fisheries Act. Reflecting on the key principles listed above, issues of scientific independence from policy and stakeholder influences and inclusion of appropriate and diverse technical expertise seem apparent.

B Harvest Strategy Standard for New Zealand Fisheries

Fisheries NZ's *Harvest Strategy Standard for New Zealand Fisheries* (*HSS*) is a policy statement of best practice in relation to the setting of fishery and stock targets and limits for fish stock in New Zealand's QMS; it forms a core input in fisheries management setting of TAC.[387] The *HSS* is focused on single species biological considerations and related uncertainties and includes only limited consideration of economic, social, cultural or ecosystem issues. It is intended to provide guidance as to how fisheries law is applied in practice in the setting of TAC. Although in *Royal Forest and Bird Protection Society of New Zealand Inc v Minister of Fisheries* the status of the *HSS* was recently disputed by the inshore fishing industry as "a generic set of default guidelines" that the seafood industry "has never adopted", the High Court found that the *HSS* remains best international practice and is considered part of best available information under the Act.[388] The Court also found that an industry-led Plan to rebuild a particular fish stock, the implementation of which was based on voluntary measures by the fishing industry, should not have been an "integral part" of the Minister's decision in setting TAC; further, it was found to be an irrelevant consideration in setting measures for stock under the Act.[389] This judgment adds weight to an argument put forward by the current

[386] At 176.

[387] Fisheries New Zealand *Harvest Strategy Standard for New Zealand Fisheries* (October 2008); used in conjunction with *Operational Guidelines for New Zealand's Harvest Strategy* Standard (June 2011); see at <www.mpi.govt.nz/fishing-aquaculture/fisheries-management/how-we-manage-new-zealands-fisheries/>.

[388] *Royal Forest and Bird Protection Society Inc v Minister of Fisheries* [2021] NZHC 1427 at [149], [150] and (per Gwyn J) at [156]. Note Carbines (2021), above n 326, argues that given the lower levels of information and uncertainty inherent in most fish stocks in New Zealand, the targets and limits routinely applied using the *Harvest Strategy Standard* (2008) are not precautionary.

[389] See at [169] – [200].

research: ie that New Zealand's natural resource management regime, its attendant information provisions and information management and science research processes will be better served by formalising (legalising) hitherto "informal" standards such as the *HSS* and *Science Information and Research Standard*. Similarly, creating and formalising pathways for the incorporation of customary Māori information and mātauranga Māori would better recognise Aotearoa's Crown–Māori partnership in the ownership and management of natural resources.

C A Bird's Eye View

Pertinent to contested science information, the PMCSA's 2021 report found that: [390]

> There is no single source of truth in the fisheries sector […]. Passionate debate arises from (over-)interpretation of uncertain datasets by all sides, which supports conflicting narratives of 'what the evidence says'. We have tried to highlight where particular points of contention lie in interpreting data and were saddened by the number of incidences of 'alternate facts' that we navigated in this project. The inherent uncertainty in fisheries management is very easily manipulated to support a particular narrative. […] The very basis of our fisheries management is often fiercely contested.

This statement echoes the tensions in commercial fisheries management identified throughout this chapter which, together with customary and recreational fishing interests, casts fisheries management overall as a wicked problem. The need to revise fisheries management within a more integrated management framework which goes beyond the current Fisheries Act 1996 and related regulations is starkly evident.[391] The report found that significant gaps exist in data and knowledge relating to how fishing impacts the marine environment,[392] that data is also poorly integrated across different stakeholders and that the "mountain" of electronic and other data collected for compliance purposes could be better mined for environmental, commercial and social outcomes.[393] Additionally, it found:[394]

> Aggregation of non-sensitive data from industry sources and integration with data from a wider range of scientists from different disciplines and regulators could radically change the amount of information available on which to base decisions, and the decision-making processes must be open to incorporate this data in a transparent way.

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[390] Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (February 2021) at 2.

[391] At 198.

[392] At 108-109.

[393] At 2. See also at 184-186.

[394] At 2.

This echoes earlier chapters' recommendations for wider use of information and data generated under geothermal resource consents, and reconsideration of consent holder commercial sensitivity claims.

In summary of this part, fisheries management science and science processes face considerable challenges relating to information. While a combination of factors contributes to this situation, core to them is the lack of directive information requirements for the regulator within the Fisheries Act 1996, including no specific research or information-gathering requirements, weak implementation of environmental principles and non-mandatory fisheries plans. Both the *Research and Science Information Standard* and *Harvest Strategy Standard* are informal guides to decision-making. They are based on international best practice rather than on core provisions of the Act. A compounding problem is wider fisheries and oceans legislation and regulations' lack of overall integration.[395]

VII Key Points

This chapter has contributed to the research by reviewing ocean fisheries management in relation to geothermal resource management. It showed how property interests in natural resources and the perceived function of property holdings in natural resources can affect information provisions in managing a natural resource. The Fisheries Act information principles and environmental principles are also functionally constrained by an absence of provisions that direct FNZ towards maintenance of knowledge or generation of research or the quality and types of information generated to support the purpose of the Act. The Act provides no substantive information requirements pertaining to the regulator and no provision comparable to for example RMA s 35 that would require FNZ to gather information on, research and monitor the state of the environment as it relates to fishing. The information requirements for commercial fisheries users (including under fisheries regulations) have been historically reliant on trust between commercial permit holders and FNZ. The process of obtaining and using information has become highly politicised in the relationship between the Ministry and the industry it is charged with regulating. The identity creation of Māori by the Crown was similarly politicised and reflected in customary fishing regulation-making information provisions, and compliance discource, and in information pathways for customary Māori information and mātauranga Māori which only partially recognise and provide for Māori.

[395] Severinsen, Peart and Rollinson *Breaking Wave* (2021), above n 85.

Unlike the property-like holdings under resource consents for geothermal resource use, quota holdings in fisheries are owned in perpetuity. The strength of this property right and the state's decision to allocate and consolidate fisheries quota and to devolve fisheries services to the fishing industry have had lasting effects on the shape, scope and fulfilment of fisheries information provisions. The *Science and Research Information Standard* was an attempt by FNZ to regulate information gathering, data processes and peer review used in fisheries research. Compared to geothermal peer review, fisheries management peer review standards are more clearly articulated. Like fisheries management, geothermal peer review could better reflect the key principles found internationally for information quality assurance and peer review, especially regarding: appropriate evaluation and full reporting of uncertainty and risk; transparency and openness of peer review process; declaration and management of conflicts of interests; and retention of adequate in-house scientific capabilities, and training of managers and policymakers, to establish an effective science-policy interface. Both fisheries and geothermal peer review processes receive scant independent (external) oversight.

The *Future of Commercial Fishing* report highlighted the dire need to overhaul fisheries information and science processes under the Fisheries Act 1996. As Doremus cautioned (see chapter two), one result of scholarship's long-standing focus on recognising information as a limiting factor in natural resource decision-making is that too little heed has been paid to the complex *processes* by which scientific and technical information is produced, expressed, transmitted and ultimately incorporated into decisions. This chapter has attempted to show how different types of property holdings in natural resources have affected information requirements and processes to manage ocean fisheries resources and how contestation of information rather than conversations about information quality, relevance and representation and its connection to broader environmental goals dominated the fisheries conversation since the inception of the QMS.

The chapter helped answer the research question by painting a clear substantive and empirical picture of *how* information provisions are key to ocean fisheries management. The problem areas identified in information provisions and the long-term effects of historical decision-making heavily influenced by neoliberal conceptions of the function of property in natural resources show enduring, problematic effects. The analysis provides critical insight to explore answers to the research question's challenge to identify ideal characteristics for information requirements in natural resources law.

CHAPTER SEVEN
PETROLEUM RESOURCES LAW

I Introduction

This chapter examines legal provisions for information about petroleum resource development under the Crown Minerals Act 1991 (CMA or the Act). The chapter helps answer the research questions by comparing the information requirements of one energy "mining" regime with another to ascertain whether optimal legal characteristics are found in CMA information provisions which might enhance the equitable and sustainable management of geothermal resources under the RMA 1991.

Perhaps more than any other resource development scenario, petroleum development epitomises the natural resource bargain due to the high risks of development, especially where it occurs offshore. The petroleum resource bargain is primarily about the way risks and costs are borne, where benefits accrue and the terms by which these are arranged. To this end, both securities law under the Financial Markets Conduct Act 2013, and international resource reporting codes and standards of practice are discussed as they relate to petroleum information requirements. International resource reporting codes for geothermal resource management are also discussed and compared.

In this chapter, legal provisions for petroleum resource permitting information fall into five categories:

- permit-related information requirements about prospecting, exploration and mining;
- information requirements about participation of Māori in petroleum development;
- information provisions limiting the protection of commercially sensitive information and data;
- resource reporting and risk disclosure information requirements for capital investment and ongoing disclosure obligations under securities law; and
- international resource reporting codes and standards of practice.

Overall, the CMA information provisions tell a clear (albeit evolving) story of the economic and financial value of petroleum resources and how (and whose) interests are provided for in

petroleum resource development. Limiting protection of commercially sensitive information and data is intended to promote resource development by allowing information access by other prospectors and developers. The Act also promotes competitive petroleum development via tender and cash bidding for exploration permits, with requirements for information and data and through its links to securities law and the mandatory use of internationally recognised reporting codes.

Information requirements relating to Māori show how and why multilateral interests in natural resource development decision-making must be taken into account—specifically for Māori in their constitutional role.[1] Since the CMA's enactment, Waitangi Tribunal recommendations and law reform have reshaped CMA information requirements relevant to Māori.

The purpose of this chapter is fourfold:

1. to show how Māori interests have (theoretically) been better provided for by amendments for improved information provisions and to assess this improvement in practice with reference to regulation theory and discourse analysis;
2. to show that the petroleum resource regime provides only limited protection for permit-holder generated information and data deemed commercially sensitive, why this is so and whether a limited protection policy could apply to geothermal resource management information and data;
3. to show that international resource reporting codes and standards of practice in petroleum resource management are applied to permit-holder information provisions, the purposes of which have application to strengthen arguments for similar information requirements for geothermal resource management; and
4. to show the state's evolving role in the management of natural resources and how, and to what extent, the CMA regime reflects this evolution in law with particular effect to information provisions, and to ask whether similar evolution should occur regarding geothermal resource management.

The CMA regime manages a non-renewable energy resource which, although without the usual sustainability provisions associated with renewable resource development, nevertheless raises sustainability-related questions.[2] For example, it raises questions about environmental effects

[1] See Barry Barton "Energy and Natural Resources Law in New Zealand: An Eventful Forty Years" (2022) 40 Energy & Natural Resources Law 1, 9-16 at [2.1] and [4].

[2] When first introduced Part IX of the Resource Management Bill 1989 (224-1) (later the RMA 1991) included provisions relating to both the allocation and environmental effects of the exploration of Crown-owned minerals. However, during consideration of the Bill it was concluded that it was not appropriate to apply the concept of sustainable management to non-renewable resources. The relevant provisions were therefore removed from the Resource Management Bill and the Crown Minerals Act 1991 was enacted. See Derek Nolan "The Coastal

of petroleum mining, climate change adaptation and mitigation and the life-cycle of raw resources as extracted and commodified in Aotearoa New Zealand. Analysing and reflecting on the petroleum regime invites normative questions about the management of publicly-owned geothermal resources.

New Zealand's producing petroleum fields are in the Taranaki Basin which sits both offshore and onshore on the North Island's west coast.[3] The current government excluded future permitting for offshore petroleum exploration and mining in 2018 and has limited new petroleum exploration and mining permits to the onshore Taranaki Region only.[4] However, existing petroleum permitting rights were not affected and current law and regulations continue to apply for existing permits. The current government's unilateral decision to ban future offshore petroleum development may be questionable, given the constitutional role of Māori and that Māori rights in petroleum resources have not been conclusively determined by the Crown.[5]

Over the last decade, New Zealand's petroleum development generated more than NZD 3.5 billion in royalties and Energy Resource Levies for the Crown.[6] Petroleum exports (in 2018) brought approximately NZD three billion to New Zealand yearly in tax and royalty payments.[7] The petroleum sector is deeply integrated within the wider economic system in Aotearoa New Zealand. Petroleum exploration and production in New Zealand is characterised as a partnership between exploration and mining companies and the government as a representative of the taxpayer's interests.[8] In addition to the government's usual ownership and overseeing

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Environment" in Derek Nolan (ed) *Environmental and Resource Management Law in New Zealand* (5th ed, LexisNexis, 2015) at [5.96]. For a useful overview of the environmental effects of mining in New Zealand see Michelle Van Kampen "The Adequacy of Legislation Regulating the Environmental Effects of Mining" 16 NZJEL 203 (2012); see further Michelle Van Kampen and Bal Matheson "Minerals and Petroleum" in Derek Nolan (ed) *Environmental and Resource Management Law in New Zealand* (5th ed, LexisNexis, 2015).

[3] There are 17 other known petroleum basins across New Zealand's EEZ and most petroleum produced in New Zealand has come from the offshore area; see New Zealand Petroleum and Minerals "Minerals in New Zealand" at <www.nzpam.govt.nz/nz-industry/mineral-estate/>.

[4] Crown Minerals (Petroleum) Amendment Act 2018; see also CMA 1991 s23A(2).

[5] See Waitangi Tribunal *The Petroleum Report* (Wai 796, 2003).

[6] MBIE *Responsibly Delivering Value – A Minerals and Petroleum Resource Strategy for Aotearoa New Zealand: 2019 – 2029* (November 2019) at 13.

[7] The New Zealand National-led government planned to increase its petroleum exports ten-fold by 2025 and invested over NZD 8.2 billion petroleum exploration and development, see MBIE "Petroleum and Minerals Report" (Business Growth Agenda, 2013).

[8] Sean Rush *Spindletop Report on the Information Disclosure Requirements under New Zealand's Petroleum Regime* (June 2016) at 2, see <www.spindletoplaw.co.nz>.

role in the natural resource bargain, the government's role in petroleum management can also be considered like that of a joint-venture partner due to the high economic value of the resource. This joint-venture-like relationship drives the need for provision of robust and timely information about resource development activities for visibility over financial returns and expected expenditure.[9] The economic value of the petroleum resource (including financial value and commodity value as a high-energy resource), the resource's finite availability, its exportability and its role in energy security and supply therefore mean information provisions under the CMA and regulations focus on financial (the resource's royalty-generating capacity) rather than environmental considerations.

A Historical Overview of Petroleum Management

Petroleum nationalisation in 1937 was undertaken to enhance New Zealand's economic performance and to avoid possible shortages of petroleum supplies given the strategic importance of oil at the time.[10] Securing and controlling the resource for New Zealand's sea defence and increasing the self-sufficiency of the British Empire in fuel were the main concerns in warding off physical shortages. The need for a centrally rationalised system for strategic and economic reasons, with a regime that was simple, accessible and attractive to international petroleum companies with sufficient capital to exploit the resource were also arguments put forward by the Crown in support of nationalisation.[11] As the name implies, nationalisation of the petroleum resource continues under the CMA.

Māori objected to the marginalisation of their rights and interests in petroleum resources through nationalisation and subsequent management practices.[12] Although pre-colonisation Māori had no economic need of petroleum resources, nor the technology at the time to develop them, matauranga Māori and the petroleum phenomena were integrated into early Māori

[9] At 2.

[10] For history and discussion of the CMA 1991, see Van Kampen and Matheson (2015) above n 2; and Tom Bennion "Access to Minerals" (2007) 7 Pol Quart 1.

[11] Waitangi Tribunal *The Report on the Management of the Petroleum Resource* (Wai 796, 2011) at [4.1] and [5.12].

[12] The Petroleum Act 1937 contained no reference to the Te Tiriti/Treaty of Waitangi 1840. See *The Petroleum Report* (2003), above n 5, at [4.3] – [4.4]. Many claims by Maori regarding the ownership of minerals such as petroleum, gold, silver and coal have been made under the Treaty of Waitangi Act 1975; see S Kenderdine "Legal Implications of Treaty Jurisprudence" (1989) 19 VUWLR 347 at 363-365; and regarding native title, see Paul McHugh *The Maori Magna Carta* (Oxford University Press, 1991) at 264-269. The effects of mining on Indigenous communities (internationally, and including on Māori) and on the resources important to them may be different from effects of mining on society as a whole, see Barry Barton *Canadian Law on Mining* (2nd ed, LexisNexis Canada, 2019) at 12.

cosmology and whakapapa (genealogy) relationships local to their occurrence.[13] The Waitangi Tribunal produced two reports in 2003 and 2011 in respect of Māori rights and interests in petroleum resources.[14] The 2003 report found that prior to nationalisation of the petroleum resource that Māori had legal title to petroleum resources, that a Treaty interest was created in favour of Māori for the loss of legal title to petroleum and that it is in breach of the Treaty principle for the Crown to exclude petroleum-based remedies from Treaty settlements.[15] The 2011 report, *The Report on the Management of the Petroleum Resource,* has particular relevance to statutory information provisions and permit-holder obligations concerning Māori Te Tiriti interests and participation in petroleum development. While the CMA holds that "All persons exercising functions and powers under [the] Act shall have regard to the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)", 2013 amendments to the Act strengthened Te Tiriti-related provisions for information from permit holders.[16]

B The Waitangi Tribunal Petroleum Management Report 2011

Setting aside the question of petroleum resource ownership (the subject of the 2003 report), the claimant's case in the 2011 report characterised one of the three systemic problems of the petroleum management regime's failure to comply with the principles of Te Tiriti was that "the substance of the law is biased against Māori interests in the natural world and in their culture, in favour of conflicting interests".[17] The second and third problems the claimants case identified were: 1) that the processes established to apply the law fail to ensure that there was effective participation by Māori to safeguard their interests, and those processes actually deter,

[13] *The Petroleum Report* (2003), above n 5, at [2.2].

[14] At [6.4.3] – [6.4.4] regarding the Crown's historical involvement in petroleum development; see also *The Report on the Management of the Petroleum Resource* (2011), above n 11.

[15] *The Petroleum Report* (2003) above n 5, at [7.1]. Note in other countries the state may have a resource revenue sharing agreement with its Indigenous people. For example, these agreements have become standard in several parts of Canada where provincial or territorial governments commit themselves to some sharing of the revenues they obtain from mineral taxes and royalties with Indigenous representative organisations; see Barton (2019), above n 12, at 180.

[16] CMA 1991 s 4; Crown Minerals Amendment Act 2013 (No 14); and Crown Minerals (Petroleum) Amendment Regulations 2013.

[17] *The Report on the Management of the Petroleum Resource* (2011), above n 11, at [3.4]. The claimants case in the 2011 report, mainly pertaining to the RMA 1991 and CMA 1991, was set against the backdrop of the 2003 report which concluded certain tangata whenua have an interest in the petroleum resource that deserves separate redress in their Te Tiriti settlements with the Crown; those groups being either or both: those who have lost land containing petroleum as a result of Crown conduct in breach of Te Tiriti; and those who were unjustly deprived of royalties for any petroleum still in their legal ownership at the time of its nationalisation in 1937 without compensation. The claimants in the 2011 report considered that the Crown "has done very little since 2003 to improve their position under the CMA and RMA", see at [5.2.1].

and sometimes deny Māori involvement; 2) and that Māori communities do not have the capacity to overcome the obstacles to their effective participation in the system because there are no reliable and sufficient sources of assistance available to them.[18] This chapter examines the 2013 amendments related to information provisions against these claims, and current government policy for petroleum resource management affecting Māori. The claimant's criticism of the CMA in the 2011 report centred on four features:[19]

> 1 The [Minister and Chief Executive's] failure to consult with tangata whenua [people of the land] on the policy issues set the context for the Act's implementation;
> 2 The narrow scope of the Crown's consultation and the limited opportunities for it to occur;
> 3 The lack of Māori expertise in the process by which the Minister exercises discretion to exclude land of particular importance to the mana of iwi [tribal authority]; and
> 4 The absence of any requirement for petroleum permit holders to engage with tangata whenua and be accountable for the quality of that engagement.

As an information provision for permit holders, this chapter focuses on the later feature which (subsequent to amendments) is now a requirement under the CMA.[20]

II Crown Minerals Act 1991: Purpose and Information Needs

The legislative framework for developing Crown-owned (state-owned) minerals in New Zealand is set out in the CMA.[21] The CMA nationalised particular minerals (ie all gold, silver, petroleum and radioactive minerals and approximately half of the coal, metallic and non-metallic minerals, industrial rock and building stone in New Zealand) on behalf of all New Zealanders including Māori, and the Crown has rights to all minerals in New Zealand's Exclusive Economic Zone (EEZ).[22] The CMA governs the allocation of rights to explore for

[18] At [3.4].

[19] At [5.3.1].

[20] CMA 1991 s 33C; and Ministry of Business, Innovation and Employment (MBIE), New Zealand Petroleum & Minerals (NZPAM) *Petroleum Programme (Minerals Programme for Petroleum 2013)* (May 2013) at [2.11].

[21] This section draws on a study of information requirements for petroleum resources under the CMA 1991 and (broadly summarised) information requirements for geothermal resource management under the RMA 1991 carried out by Rush (2016), above n 8.

[22] CMA 1991 s 10. Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977 ss 3-6A. Marine-based minerals projects beyond 12 nautical miles from shore require a continental shelf licence under the Continental Shelf Act 1963, and a marine consent under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (in addition to a permit from NZPAM). Within the 12 nautical mile limit, and onshore, a resource consent must be had under the RMA 1991 in addition to a permit from NZPAM. Other regulatory agencies are also involved, see Van Kampen and Matheson (2015), above n 2.

and mine petroleum in its natural state in New Zealand, including within the territorial sea, EEZ and continental shelf.

The purpose of the CMA is to promote the prospecting, exploration and mining of Crown-owned minerals for the benefit of New Zealand. To this end, the Act provides for:[23]

> (a) the efficient allocation of rights to prospect for, explore for, and mine Crown-owned minerals; and
>
> (b) the effective management and regulation of the exercise of those rights; and
>
> (c) the carrying out, in accordance with good industry practice, of activities in respect of those rights; and
>
> (d) a fair financial return to the crown for its minerals.

Under the Act, the Crown via its permitting agency—New Zealand Petroleum and Minerals (NZPAM)—collects information on the mineral estate to promote efficient management and development of resources and to inform investment decisions. An underlying premise of the Act is that the government wants other parties such as public and private corporations to undertake prospecting for and exploration and mining of Crown-owned minerals.[24] To this end, the legal requirements for information from permit applicants and permit holders can be divided into two types of information managed by NZPAM: information which helps to promote the efficient allocation of rights (such as information and data useful to developers about the location, quality, quantity and type of resource in place); and information about how a permit holder is managing its operations for regulatory compliance reasons, including financial-related information to calculate royalty returns and promote investment decision-making. To protect commercially sensitive information, the first of these two types of

[23] CMA 1991 s 1A(1) and (2). This purpose provision was added by the Crown Minerals Amendment Act 2013 s 6. Debate was had regarding the Act's purpose to "promote" development because it was considered that as a regulatory body NZPAM should not be engaged in resource development promotion; see Sefton Darby *The Ground Between: Navigating the Oil and Mining debate in New Zealand* (Bridget Williams Books Ltd, Wellington, New Zealand, 2017) at 112. The "fair financial return to the Crown" (CMA 1991 s 1A(2)(d)) has also been criticised for not recognising the broader economic benefits of mining activities, particularly the direct economic benefit to districts and regions where mining occurs, with calls for a proportion of royalties received by the Crown (CMA 1991 s 34) to go directly to the relevant district or region where that mining occurs; see Van Kampen and Matheson (2015), above n 2 at [7.4]. In 2019 the Labour government released a discussion document for a review of the CMA 1991, the objectives of which were to ensure New Zealand's minerals and resources sector contributes to a productive, sustainable and inclusive economy, which manages risks, and promotes a coherent and fair regulatory regime; see MBIE *Review of the Crown Minerals Act 1991* (November 2019).

[24] The government does not wish to undertake these activities itself, although it may from time to time undertake seismic surveying or other prospecting activities for the purpose of providing information to promote interest in New Zealand's petroleum estate. See NZPAM *Petroleum Programme* (2013), above n 20, at [1.3(4)].

information is made publicly available after limited holding periods (see below), while the later requirements can be met without NZPAM's needing to disclose such information to the public.

The Minister of Energy and Resources has responsibility for administering the CMA and it is the Minister who promulgates *Minerals Programmes* (which provide the management framework for central government decisions on minerals allocation) and allocates rights under the Act.[25] A function of the Minister, s 5(e), is:[26]

> (e) to collect and disclose information in connection with mineral resources and mineral production in order to—
>
> (i) promote informed investment decisions about mineral exploration and production; and
> (ii) improve the working of related markets […].

Related to this function and the purpose of the Act are the record keeping and information reporting requirements of ss 90 and 90A – 90E. The Crown Minerals (Petroleum) Regulations 2007, the Crown Minerals (Royalties for Petroleum) Regulations 2013 and *Petroleum Digital Data Submission Standards* also further detail information reporting requirements.[27]

"Good industry practice" (at (c) above) relates to a permit applicant's ability to provide, within reasonable economic and technical constraints, "good quality data such as sufficient data, in appraisal and development to resolve uncertainties that affect the success of petroleum recovery.[28] Relatedly, a petroleum prospecting permit "shall not be granted" where the Minister considers that the application is unlikely to materially add to the existing knowledge of the mineral in all or part of the land to which the application relates or if "substantial interest" for exploring or mining the mineral already exists in the application area.[29] The Act defines good industry practice. In relation to an activity, this means acting in a manner that is technically competent and at a level of diligence and prudence reasonably and ordinarily exercised by experienced operators engaged in a similar activity and under similar

[25] CMA 1991 s 5. See NZPAM *Petroleum Programme* (2013), above n 20. Note this is the third petroleum minerals programme, earlier editions being published in 1995 and 2005.

[26] CMA 1991 s 5 subs (e) was added by the Crown Minerals Amendment Act 2004 s 3.

[27] NZPAM *Petroleum Digital Data Submission Standards* (July 2016).

[28] NZPAM *Petroleum Programme* (2013), above n 20, at [[1(12)(g)]. Note the *Petroleum Programme* interprets "good industry practice" to include risk management systems for operational and health and safety risks, see at [1(11) and (12)(f)]; and CMA 1991 s29A(2)(a)(iii) and (b), (c) and (d).

[29] CMA 1991 s 28(a) and (b). If the Minister is satisfied that s 28 "special circumstances" apply, a permit may be granted however.

circumstances but which (for the purpose of the CMA) does not include any aspect of the activity regulated under environmental legislation.[30]

In addition to informational and financial capability and an applicant's ability (and track record) to pay royalties and fees, risk management reporting is also a requirement of securities law information disclosure obligations.[31]

A Legislative Amendments 2013

In 2013, a broad review of the CMA led to significant amendments to the Act and regulations with the purpose of increasing investment in petroleum exploration and production in New Zealand.[32] The Minister recognised that optimising data requirements and disclosure obligations of permit holders would improve resource knowledge and encourage investment.[33] Importantly, a review of petroleum reserves reporting found the quality and quantity of petroleum reserve data provided by permit holders to be insufficient to allow NZPAM to independently verify and validate reserve estimates thus negatively affecting optimal management of the petroleum estate.[34] The reasons the review found for this included a lack of regulatory resources and capability, inconsistency against reporting requirements by permit holders, commercial sensitivity that permit-holder companies place on reserves information and inconsistencies in methodologies used to derive reserves estimates between permit-holder companies.[35] New Zealand was found to lag behind international best practice regarding both petroleum reserve reporting and making information publicly available.[36] While international

[30] CMA 1991 s 2(1). Regarding the application of good industry practice and environmental considerations in petroleum development, see Nicola de Wit and Barry Barton "Is the New Zealand EEZ Regulatory Framework International Best Practice?" (from proceedings Environmental Defence Society Conference "Navigating our Future: Addressing Risk and Building Resilience", August 2014).

[31] CMA 1991 s 34

[32] MBIE *Reviewing the Crown Minerals Act 1991* (discussion paper, August 2010); Hon Gerry Brownlee (media release) "Unlocking New Zealand's Petroleum Potential" (19 November 2009) at <www.beehive.govt.nz>; Crown Minerals Amendment Act 2013 (No 14); and Crown Minerals (Petroleum) Amendment Regulations 2013. See also MBIE *New Zealand Energy Strategy 2011—2021* (August 2011).

[33] Cabinet Paper "Crown Minerals Act Review: Minerals Programmes and Regulations" (Cabinet Economic Growth and Infrastructure Committee, Office of the Minister for Energy and Resources) (n.d) annex 1.

[34] MBIE "New Zealand Petroleum Reserves" (report arising from the Government's Action Plan to Maximise Gains from Petroleum Resources, August 2010).

[35] At 8 and 9.

[36] At 12. See the extensive resource reporting commentary and proposed changes in Cabinet Paper (n.d), above n 33, at [1] – [4], [14] and Annex 1 'Changes to Regulations under the Crown Minerals Act' at [14] – [17].

mineral reserves reporting standards now apply under the CMA, there was no internationally standardised resource reporting required by permit holders prior to the 2013 amendments.[37]

The 2013 amendments added information auditing powers for enforcement officers and independent auditors for the purpose of determining permit-holder compliance with permits or regulations.[38] Auditing of records may be carried out to obtain information about minerals reserve and royalty calculations and about "compliance with any prescribed requirement to keep or provide records or other information".[39] The powers of auditors and enforcement officers are extensive. They may require "any information" they consider necessary related to "any aspect of the operation of a permit" and "any commercial agreements or arrangements to which the permit participant is a party."[40] Such information must be provided by the permit holder whether NZPAM agrees to keep it in confidence or not.[41]

Provisions to strengthen Crown engagement with iwi and hapū ahead of permits being awarded were also added, with the purpose of fostering long-term productive relationships between permit holders and iwi and hapū.[42] The Minister noted that the Waitangi Tribunal's 2011 report "identified a number of gaps in how the Government engages with Māori on petroleum issues" and that the Tribunal's report was taken into account in the CMA review with "many of the Tribunal's recommendations picked up in the Minerals Programmes and operational policies of [NZPAM]", thus representing a "substantial involvement" by Māori.[43]

III Petroleum Resource Permitting

The CMA, associated regulations and *Minerals Programmes* govern the allocation of rights to petroleum resources via a permitting process administered by NZPAM.[44] This section explains

[37] CMA 1991 s 105C; Crown Minerals (Petroleum) Regulations 2007 cl 39, sch 6, art 18 (a)—(f). Cabinet paper (n.d), above n 33, annex 1 at [viii].

[38] See CMA 1991 ss 99A-99E and ss 99B(1) and s 99E(1) and (2). Cabinet Paper (n.d), above n 33, at [32] and [71].

[39] CMA 1991 s 99E(1)(a), (b) and (d). See Cabinet Paper (n.d), above n 33, at [4] and [16] – [24].

[40] CMA 1991 s 99F(1) and (2); and ss s 99B and 99E. Note this provision may be contrasted with the private agreements between resource consent holders on the Kawerau geothermal system where the Bay of Plenty Regional Council is not party to such agreements; see chapter four.

[41] CMA 1991 s 99F(3) and (4)(d).

[42] Cabinet Paper (n.d), above n 33, at [32] and [71] – [77]; and NZPAM *Petroleum Programme* (2013), above n 20, at [2] and sch 1.

[43] Rt Hon Phil Heatley (Minister of Energy and Resources) Parliamentary Debates *Hansard* (25 September 2012) regarding the first reading of the Crown Minerals (Permitting and Crown Land) Bill.

[44] CMA 1991 ss 13 – 22 and 105.

the permitting process to provide context for the information provisions discussed and to show how permit authorisations and privileges are closely tied to the provision of information and data that applicants and permit holders give NZPAM. A permit provides a permit holder with rights to prospect, explore and mine petroleum resources subject to conditions.[45] These include responsible development of the resource and (for petroleum resources) the payment of royalties and fees to the Crown.[46] Where a permit holder lawfully obtains resources, these then become the property of the permit holder.[47]

Due to the physical characteristics of petroleum resources such as their subsurface and fugacious properties (which make them difficult to locate, quantify and develop and which also affect levels of investment capital and risk), their development usually occurs in stages over many decades. Development typically occurs in three distinct phases. In New Zealand, each phase requires a separate permit issued by NZPAM.[48] These phases are: [49]

- the prospecting phase, where low-impact activities such as geological mapping, hand sampling, and aerial surveys are made;
- the exploration phase, with (usually) a non-exclusive right to explore for specified minerals in an area, using higher impact methods, such as drilling, bulk sampling and mine feasibility studies; and
- the mining phase, where the exact nature and extent of the exploitable mineral deposit is known and a permit holder has exclusive access to the resource.

Prospecting and exploration are sometimes carried out by a speculating company (a speculative prospector) separate to the resource developer. However, in either case the activity can take between two to four and for up to 15 years. The speculative prospector—a new category of prospector created in 2013—is defined as a non-exclusive permit holder who carries out activities under the permit solely for the purposes of on-selling the information obtained on a non-exclusive basis to petroleum explorers and producers.[50] The speculative prospector is different to other prospecting permit holders who usually also intend to explore and mine.[51]

[45] CMA 1991 s 33.

[46] CMA 1991 s 99H and 34; and Crown Minerals (Petroleum Fees) Regulations 2016.

[47] CMA 1991 ss 31 and 33(1)(a).

[48] Note sometimes a mining company will apply for an exploration permit (skipping the prospecting phase) if the likelihood of a proven resource and its development is high.

[49] CMA 1991 ss 8(1)(a) and 30.

[50] CMA 1991 s 90C(7).

[51] See further NZPAM *Petroleum Programme* (2013), above n 20, at [8.3].

Mining permits are usually allocated to an exploration permit holder who has discovered a petroleum field within an exploration permit area.

Prospecting permits are usually issued non-exclusively for up to four years and do not include subsequent rights to exploration and mining.[52] Multiple permit holders may also have access to the same area for prospecting, exploration and mining.[53] Depending on whether the area permitted is on- or offshore, its geographic remoteness, water depth (if offshore), the extent of previous exploration in the area and availability of relevant geographical information and whether a permit is for exploration of conventional hydrocarbon resources, an exploration permit may be issued for up to 15 years.[54]

Exploration permits are allocated competitively (usually annually) via Petroleum Exploration Permit Rounds (also known as "block offers") by either staged work programme bidding whereby the best work programme is awarded the permit or cash bonus bidding.[55] A major factor in determining which tender will receive an exploration permit will be a bid's information-gathering value.[56]

All permit applicants must provide a proposed work programme for a permit. It can comprise committed activities or committed and contingent activities.[57] An applicant must satisfy the Minister that the proposed work programme is consistent with the Act's purpose, the purpose of the proposed permit and good industry practice.[58]The Minister must take into account the applicant's technical ability; financial capability; and any relevant information regarding an applicant's previous failure to comply with prospecting, exploration or mining. He/she must also be satisfied that an applicant is likely to comply with the conditions of and give proper effect to the proposed work programme,[59] including the ability to comply with all relevant

[52] CMA 1991 ss 23(1), 28, 32(1) and 35(1).

[53] NZPAM *Petroleum Programme* (2013), above n 20, at [7.3(4)].

[54] CMA 1991 ss 35(3) and 35A and sch 1 cl 7. See further NZPAM *Petroleum Programme* (2013), above n 20, at [7.8(2)] and [10].

[55] At [7.2]; CMA ss 24 and 32(2). See further block offers and tendering process at <www.nzpam.govt.nz/permits/petroleum/block-offer/>.

[56] At [7.6(1)(b)].

[57] CMA 1991 s29A(1)(b) and (c).

[58] CMA 1991 ss 29A(2)(a) and 33(1)(b).

[59] CMA 1991 s 29A(2)(b).

obligations under the Act and in respect of information reporting and the payment of fees and royalties.[60]

Many considerations affect the issuing of mining permits, for example: [61]

- geology and the nature and extent of the petroleum to be extracted and produced;
- estimates of petroleum in place and recoverable petroleum reserves;
- proposed operations in respect of production and reservoir management, and processing and transportation facilities and decommissioning operations;
- the proposed production profile and proposed production start-date; and
- market or economic considerations relevant to determining maximum economic recovery.

A petroleum mining permit is usually limited to 40 years, with duration determined by taking into account such matters as the production programme, potential for enhanced production and the time required to conclude mining activities.[62]

A Access to Petroleum Resources

The granting of a permit under the CMA does not confer on the permit holder a right of access to any land.[63] Generally, under the CMA a permit holder can enter land to conduct "minimum impact activities" once 10 working days' notice is given to a landowner and occupier.[64] For more than minimum impact activities, a petroleum permit holders must secure access to the permitted area by written agreement of the owner and occupier of the land, and where relevant via the relevant government agency.[65] While some categories of Crown land may be accessed, certain types of Crown land are prohibited.[66]

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[60] CMA 1991 s 29A(2)(c). See further matters the Minister will take into account when considering a petroleum permit application under NZPAM *Petroleum Programme* (2013), above n 20, at [5.1(b)(ii) and (c)] [8.3] and [11.6].

[61] At [8.3].

[62] CMA 1991 s 35(7) and (8). For a useful lifecycle timeline for petroleum development, including for decommissioning and site remediation, see Ministry for Business, Innovation and Employment *Responsibly Delivering Value - A Minerals and Petroleum Resource Strategy for Aotearoa New Zealand: 2019 – 2029* (November 2019) at 20. Note amendments to the CMA in 2021 added provisions previously lacking for petroleum well decommissioning (including information-supply provisions); see CMA 1991 ss 89A – 89ZK; and Crown Minerals (Decommissioning and Other Matters) Amendment Act 2021.

[63] CMA 1991 s 47.

[64] CMA 1991 ss 2(1) and 49.

[65] CMA 1991 s 53 and ss 54A – 80. Certain land is also unavailable for petroleum permits, CMA 1991 s 14(2); access to Crown land is governed by ss 61, 61A, 61B and 61C.

[66] CMA 1991 ss 55(2)(a)—(g), 61 – 61C, and sch 4. Other acts regulating permit-holder access arrangements include the RMA 1991, Conservation Act 1986, and Heritage New Zealand Pouhere Taonga Act 2014. Regarding the relationship between the RMA 1991 and CMA 1991 see *Gebbie v Banks Peninsular District Council* [2000] NZRMA 553 (HC) at [27]; and *Otago Regional Council v Maruia Mining Ltd* [2019] NZDC 17475.

Special requirements for access to Māori-owned land apply. On request from iwi, certain land may also be excluded from development.[67] Consultation and engagement with relevant Māori is mandatory in permit applications and under permit holdings where obligations apply.[68] Entry onto Māori land for minimum impact activity requires additional "reasonable efforts" of consultation with landowners and not less than 10 days' notice to the local iwi authority of the land to be entered.[69] No person may enter Māori land to carry out minimum impact activities where the land is regarded as wāhi tapu (sacred) by the tangata whenua without the consent of the owners of the land.[70] The Minister may exercise discretion in excluding permit access to certain areas of land of particular importance to iwi and hapū.[71] Certain areas may also be excluded from permitting areas more generally.[72]

Generally, the CMA's provisions for access to land for the purpose of petroleum prospecting, exploring and mining are more favourable to the petroleum permit holder than are those for other Crown-owned minerals due to the national strategic importance of petroleum which provides a presumption in favour of permit holders accessing the resource.[73] Where a permit holder wants to enter land for more than minimum impact activities (such as under an exploration permit), then either the consent of each landowner and occupier must be obtained (with any conditions they negotiate) or an arbitrated access arrangement must be made.[74] While an arbitration cannot prohibit a permit holder from obtaining access to land, some access may be prevented in particular circumstances.[75]

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[67] CMA 1991 ss 15(3) and 51.

[68] CMA 1991 ss 51, 52 and 33C. Regulation-making regarding CMA 1991 s 33C engagement obligations may be made, CMA s 105(ca), and (cb). See further NZPAM *Petroleum Programme* (2013), above n 20, at [2] and sch 1 summary of Crown Minerals protocols regarding Crown obligations in regard to Deeds of Settlement.

[69] CMA 1991 s 51(1)(a) and (b).

[70] CMA 1991 s 51(2).

[71] CMA 1991 s 14(2)(c). NZPAM *Petroleum Programme* (2013), above n 20, at [2.7].

[72] CMA s 28A and sch 4. *The Report on the Management of the Petroleum Resource* (2011), above n 11, at [5.2.3] – [5.2.5].

[73] At [4.2.7]. Note on consideration of the Crown owned minerals provisions as originally incorporated in Part IX of the Resource Management Bill 1989 (224-1) the Review Group appointed to address issues raised in the Bill were tasked with considering in relation to minerals "Whether the measures in the Bill spell out the appropriate balance between the Crown's legitimate interest in having accurate knowledge of the extent of its mineral resources and the surface landowners' right to undisturbed possession in respect of access to land." See Ministry for the Environment *Report of the Review Group on the Resource Management Bill* (Wellington, February 1991) at 119.

[74] CMA 1991 s 53. A reasonable condition can also include compensation, s 70.

[75] CMA 1991 s 55(2).

IV Permit-holder Information Requirements

NZPAM is responsible for the collection, preservation and dissemination of all statutorily required information and data submitted by permit holders. Such information makes a significant contribution to the development of Crown resources.

CMA s 90 requires permit holders to keep detailed records and reports in respect of all prospecting, exploration and mining activity in accordance with permit conditions and regulations. These must be readily accessible to NZPAM.[76] General permit-holder responsibilities include record keeping "for at least 7 years after the year to which they relate or for at least 2 years after the permit to which they relate ceases to be in force […]",[77] the supply of records and reports[78] and the lodging of information and data in accordance with regulations.[79] Section 90 records and reports include financial records, scientific and technical records, records or reports required under regulations and records, reports, statements or any other documentation or information required under other legislation.[80] NZPAM's power to request information reports is broad and includes "a report on any specified aspect of the permit holder's activities under the permit".[81]

Section 90 information requirements are detailed further in the Crown Minerals (Petroleum) Regulations 2007, Crown Minerals (Royalties for Petroleum) Regulations 2013 and in the *Minerals Programme for Petroleum 2013* (*Petroleum Programme*).[82] The *Petroleum Digital Data Submission Standards* provide further guidance on information submission under permit obligations.[83]

The Crown Minerals (Petroleum) Regulations 2007 list information which must accompany prospecting and mining permit applications[84] and the record keeping and reporting

[76] CMA 1991 s 90(1)(a) and (b).

[77] CMA 1991 s 33(1)(d).

[78] CMA 1991 s 90(1).

[79] Crown Minerals (Petroleum) Regulations 2007 Part 4 and schs 6 and 7; and Crown Minerals (Royalties for Petroleum) Regulations 2013 Part 3.

[80] CMA 1991 s 90(1A)(a) – (f).

[81] CMA 1991 s 90(3)(b).

[82] Crown Minerals (Petroleum) Regulations 2007 Part 4 and schs; NZPAM *Petroleum Programme* (2013), above n 20.

[83] NZPAM *Petroleum Digital Data Submission Standards* (July 2016).

[84] Crown Minerals (Petroleum) Regulations 2007 schs 2 and 3.

requirements of permit holders.[85] Mining application information includes a statement of the technical and financial qualifications of the applicant, a map of the permit area and a report setting out the reserves and proposed work programme for the development of the field concerned.[86] Annual report information requirements for prospecting and exploration permits are listed.[87] These include information requirements for various scientific surveys[88] and information required in daily well-drilling reports.[89] Similar to resource consent application requirements for a geothermal mining operation under the RMA, considerably detailed information is required for a petroleum mining permit application, including:[90]

- geophysical and geochemical survey results from exploration;
- geological and geophysical analysis and interpretation;
- a petrophysical evaluation;
- reservoir engineering data and petroleum reserves information; and
- a proposed field development plan.

The CMA is structured to show the Minister a petroleum mining permit applicant's knowledge of both the resource in place and expected development scenarios. Thereafter, there is an ongoing legal requirement to submit information updating that supplied in an application and to supplement it with additional production data.

The *Petroleum Programme* lists key permit-holder obligations, in addition to information and data lodged under the 2007 regulations.[91] Obligations include provisions for annual reports, annual work programme review and royalty calculations and returns.[92] Annual activity and expenditure reports include all activity undertaken under any permit, including the extent of compliance with the work programme. Prospecting and exploration permit holders must include information on all field investigations, surveys, reprocessing of data and drilling activities. Mining permit holders must also include information on production rates, well-

[85] Crown Minerals (Petroleum) Regulations 2007 cls 38 – 53A.

[86] Crown Minerals (Petroleum) Regulations 2007 sch 2. Note sch 2 part 1 applies to all permit applications, while sch 2 part 2 applies to mining permit applications.

[87] Crown Minerals (Petroleum) Regulations 2007 sch 6.

[88] Crown Minerals (Petroleum) Regulations 2007 sch 7.

[89] Crown Minerals (Petroleum) Regulations 2007 sch 7.

[90] Crown Minerals (Petroleum) Regulations 2007 sch 3.

[91] NZPAM *Petroleum Programme* (2013), above n 16, at [11.1(i)].

[92] CMA 1991 s 34; and Crown Minerals (Royalties for Petroleum) Regulations 2013. Processing and monitoring of all permit types also generates general permit fees, see Crown Minerals (Minerals Fees) Regulations 2016. NZPAM *Petroleum Programme* (2013), above n 20, at [11.1(d), (e), and (f)] and [11.7]; see CMA 1991 s 33D.

simulation activities, various reservoir metrics, drilling, survey activity and proposed mining activity for the next 12 months.[93]

Annual reports also require reporting on resource reserves using international standards,[94] gas deliverability on installed infrastructure and related information.[95] Such information may be published for public interest reasons and to verify and validate estimates of reserves and resources.[96]

A company developing an oilfield will assess the resource reserve and forecast production levels for its own purposes. Doing do serves a dual function because the state as owner also requires such information to predict its income (and resource commodity) stream. Unlike most other raw resources, the petroleum resource is subject to immense price volatility due to its connection to international markets, thus increasing risks in initial capital investment decision-making and investment risk in public shareholding in mining companies. The implications of these risks for permit-holder reporting and ongoing risk disclosure obligations are discussed below.

V Information Requirements about Māori Participation

As enacted, the CMA contained no provisions for any party to consult with Māori on any matter under the Act; nor was there any requirement for permit holders to engage with Māori. Although the Act contained (and still contains) a "Treaty provision", since 1991, successive administrations have given little effect to it.[97] The presumption of the economic importance of petroleum development at the cost of Crown-Māori relations under the CMA was, for Māori, also exacerbated by the petroleum industry's tendency for non-engagement with the public or "interested parties", a tendency which for the most part is due to the low probability of exploration permit holders finding minable resources in the overwhelming majority of cases.[98] Petroleum minerals programmes are now required to describe how the Minister and chief

[93] NZPAM *Petroleum Programme* (2013), above n 20, at [11.2(1) and (2)].

[94] See CMA 1991 s 105C(1)(b) and (c).

[95] NZPAM *Petroleum Programme* (2013), above n 20, at [11.6(1)].

[96] At [11.6(2)].

[97] CMA 1991 s 4. See *The Petroleum Report* (2003), above n 5; and *The Report on the Management of the Petroleum Resource* (2011), above n 11.

[98] Darby (2017), above n 23, at 64-73.

executive's powers will be exercised under the Act in regard to the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).[99]

Iwi engagement reports also require petroleum prospecting, exploration and mining permit holders to provide the Minister with an annual report of the permit holder's engagement with iwi or hapū whose rohe (tribal area) includes some or all of the permit area or who otherwise may be directly affected by the permit.[100] The same provisions provide for the making of regulations to specify the time periods to which reports apply and when they are to be supplied by permit holders.[101] The purpose of iwi engagement reports is to encourage permit holders to engage with relevant iwi and hapū in a positive and constructive manner and to enable NZPAM to monitor engagement progress.[102] The *Petroleum Programme* encourages permit holders to consult with relevant iwi and hapū before submitting their report and, where possible and appropriate, to include in the report the views of those iwi and hapū on the content of the report.[103] The report should also note any engagement with or notification to iwi and hapū that has occurred as a requirement under other legislation.[104]

A permit holder's annual work programme review meeting with NZPAM must include the permit holder's annual report on engagement with relevant iwi and hapū. NZPAM also takes into account any comments received from iwi and hapū on a permit holder's engagement.[105] Furthermore, NZPAM may discuss with relevant iwi and hapū the outcome of the review of the permit holder's engagement report as part of NZPAM's ongoing discussions and liaison with iwi and hapū.[106]

In relation to iwi engagement under the CMA, Bargh and Van Wagner's empirical enquiry into the effectiveness of the 2013 CMA amendments for Māori found that, although "on paper" the minerals allocation process appears to include Māori and for Māori to influence decisions that are made, "a closer examination of how the process works in practice shows that Māori do not

[99] CMA 1991 s 14(1)(b). For a list of consultation matters and consultation principles, see NZPAM *Petroleum Programme* (2013), above n 20, at [2] – [2.10].

[100] CMA 1991 s 33C(1).

[101] CMA 1991 s 33C(3)(a) and (b).

[102] NZPAM *Petroleum Programme* (2013), above n 20, at [2.11(2)].

[103] At [2.11(3)].

[104] At [2.11(4)].

[105] At [11.7].

[106] At [2.11(5) and (6)].

have the ability to substantively influence decisions".[107] The authors recount a minerals tender scenario where, despite strong opposition from iwi and hapū, the NZPAM did not give effect to any of the affected iwi or hapū's requests to exclude certain areas within the tender area because the decision to do so is discretionary.[108] While the minerals tender was for gold mining rather than petroleum mining, the consultation, engagement and information requirements (iwi engagement reports) for non-petroleum minerals are largely similar to petroleum permitting requirements.[109] However, regardless to which mineral programme the mineral process and information requirements regarding Māori apply under the CMA, one can surmise the sub-optimal effectiveness of ongoing iwi engagement reports later in the minerals permitting process for Māori where almost none of their submissions for area exclusions were given effect. Bargh and Van Wagner argued, and their research indicated, that Māori views rarely influence the substantive outcomes of minerals exploration decisions because "the structure of legal relations […] routinely shifts Māori perspectives, concerns and laws outside the frame of legal relevance".[110] Further, they clarify:[111]

> The existing statutory framework specifically separates the Block Offer arrangements (which include applying for and receiving a prospecting and exploration permit and the associated mineral rights) from the activities around actual mining, with respect to social and environmental impacts. This structure of decision making privileges proponents who are presumptively entitled to develop any minerals discovered, and subsumes questions about whether to develop minerals into questions of how development will proceed. […] this limits the impact of Māori law on minerals decisions by separating questions of ownership and jurisdiction from relational environmental and social duties and obligations to particular places, resources and communities.

The authors' analysis drew on law and legal geography to examine how law and legal process is structured to uphold specific relations both between people and between people and the environment. They argue that the prioritisation of western ontologies and law and the dismissal of Indigenous ontologies and laws extends beyond any particular exploration application or

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[107] Maria Bargh and Estair Van Wagner "Participation as exclusion: Maori engagement with the Crown Minerals Act 1991 Block Offer process" (2019) 10 Journal of Human Rights and the Environment 1, 118-139 at 125.

[108] At 125-128.

[109] NZPAM *Petroleum Programme* (2013), above n 20, at [1.1(a)] and [2].

[110] Bargh and Van Wagner (2019), above n 107, at 119 and 138.

[111] At 119. In one case the authors noted, at 131, that of the 15 Iwi and hapu that made submissions in a consultation process, eight had Deeds of Settlement, Protocols, or Statutory Acknowledgements, or Iwi Management Plans setting out protections or Acknowledgements of the mana (authority) of those groups over their particular areas (see for example, the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010), with several of the Accords committing the Crown and Iwi to give effect to the principles of Te Tiriti o Waitangi.

block offer.[112] The authors also compared CMA provisions and processes for Māori with those under the RMA, finding under the CMA that there is no requirement for NZPAM to respond substantively to concerns by Māori: "the Crown can place a range of Māori place-based and environmental concerns outside the scope of the CMA process".[113] They conclude:[114]

> It is difficult to see how the Block Offer process gives genuine effect to Māori Treaty rights when those rights are from the very outset valued and ranked as being less important than prospecting, exploration and mining.

Reflecting on his tenure, former national manager of NZPAM, Sefton Darby also noted that the number of applications for area exclusions by Māori that were turned down by NZPAM was "perilously low"[115] and confirmed characterisations of NZPAM as a "permitting factory", noting both political interference and fear of litigation and pushback from mining companies.[116]

Such reflections are reminiscent of the long-term effect of the Crown's unilateral decision-making by the MAF (Minister of Agriculture and Fisheries) during the regulation-drafting process for North Island customary fishing for Māori and that under the existing customary regulations the development of rules designed by Māori for local purposes must account for commercial fishing interests and that their approval ultimately relies on Ministerial discretion.

VI Information Holding Periods

According to the purpose of the CMA "to promote prospecting for, exploration for, and mining of Crown-owned minerals for the benefit of New Zealand" and the Minister's functions "to attract permit applications" and "to collect and disclose information in connection with mineral resources and mineral production in order to promote informed investment decisions about mineral exploration and production; and improve the working of related markets", NZPAM must make resource information and data generated under petroleum permits publicly available.[117]

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[112] At 120.

[113] At 133.

[114] At 133.

[115] NZPAM "New Zealand Epithermal Gold 2013 Minerals Competitive Tender: Results of Consultation" (released under the Official Information Act 1982, 19 August 2013) at 17.

[116] Darby (2017), above n 23, at 22-3, and 174.

[117] CMA 1991 ss 1A and 5(a) and (e). Note CMA 1991 s 90 subs (8A) does not make the publishing of such information by the chief executive of NZPAM compulsory rather the chief executive "may, but is not required to, publish". However, given the purpose of the Act and the provisions of s 90 subs (6) – (8) it is arguable that an official information request is likely to succeed.

Information and data from permit holders provided under s 90 (and regulations) is made publicly available after two time-periods: five years and 15 years (with some exceptions).[118] Information supplied under petroleum *mining* and *exploration* permits may be made publicly available after the expiry of five years, from the date on which the information was obtained by the permit holder or earlier if the permit expires before five years.[119]

Information provided to the regulator by a *prospecting* permit holder who is not a speculative prospector must be released to the public on the earlier of the 15 years after it is obtained by the permit holder or after the conclusion of a public tender for exploration permits over the area, provided the release is not before five years after the information was obtained.[120] Speculative prospector permit information retains the 15-year confidentiality period.[121] The 15-year confidentiality period is maintained where another permit holder purchases or licenses data from a speculative prospector. Such information is still submitted to NZPAM and must be clearly identified as acquired from a speculative prospector permit in order to keep the 15-year confidentiality period.[122] A full 15-year confidentiality period for speculative prospector information means data and information gathered under a speculative prospector permit is more likely to retain its commercial value for a longer period, which is an incentive for those with prospecting capacity (but not necessarily exploration and mining capacity) to build up knowledge of and development in the state's petroleum resource.

Within the non-disclosure periods, NZPAM may not disclose information received under s 90 (and other related sections whereby information is provided to NZPAM) unless:[123]

> (a) the disclosure is for the purposes of, or in connection with, the performance or exercise of any function, duty, or power conferred or imposed by or under this Act on the Minister, the chief executive, or any enforcement officer; or
>
> (b) the information is publicly available; or
>
> (c) the disclosure is with the consent of the person to whom the information relates, or to whom the information is confidential; or

[118] CMA 1991 s 90 subs (6) and (7).

[119] CMA 1991 s 90(6).

[120] CMA 1991 s 90(7)(b).

[121] CMA 1991 ss 90(8) and 90A.

[122] CMA 1991 s 90D.

[123] CMA 1991s 90A was inserted by Crown Minerals Amendment Act 2004 and was later repealed by the Crown Minerals Amendment Act 2013 which replaced ss 90 and 90A and added ss 90B – 90F.

(d) the disclosure is in connection with proceedings, or any investigation or inquiry for proceedings, for an offence against this Act or any other enactment; or

(e) disclosure is required by another enactment; or

(f) disclosure is required by a court of competent jurisdiction; or

(g) the information is disclosed to a regulatory agency under section […].

NZPAM's non-disclosure of information generated by permit holders about resource use and business operations to the public is therefore limited both in time and the statutory exceptions above.[124] As noted above, a distinction is made between the resource development-related information NZPAM collects and releases to the public and information for energy planning and the calculation of royalties, for example.

The Minister may use discretion to protect information iwi provide to NZPAM either under a request for certain land to be excluded in minerals programmes or under draft minerals programme submissions.[125]

Because petroleum development companies often operate internationally, there is a general harmonisation of petroleum development law across international jurisdictions. For example, information reporting requirements under Canadian legislation have close similarity with New Zealand's requirements. The Petroleum and Natural Gas Act 1996 (British Columbia)[126] and the Mines and Minerals Act 2000 (Alberta) [127] provide for regulation-making regarding record keeping and information reporting and for considerable regulator authority regarding resource developer provision of information and data. The holding periods to protect commercially sensitive information in Alberta are also five and 15 years, for example.[128]

[124] See further at NZPAM *Petroleum Programme* (2013), above n 20, at [6.6].

[125] CMA 1991 ss 14(2)(c) and 18(5)(a).

[126] Petroleum and Natural Gas Act 1996 (BC) s 133(2)(i) and (j.1) concern regulation making powers for the provision of information relating to petroleum or natural gas mining under the Act and for disclosure of sensitive information.

[127] Petroleum and Natural Gas Act 1996 (BC) ss 47 and 48 concern record keeping in accordance with regulations and the provision of or making available records required under the Act; and written returns showing information required regarding any mining operation, the minerals recovered and the costs of their recovery.

[128] Mines and Minerals Act 2000 (Alb) s 50(3) and (4). For case commentary of *Geophysical Services Incorporated v Encana Corporation* (2016) ABQB 230; and *Geophysical Services Incorporated v EnCana Corporation* (2017) ABCA 125, regarding the expiry of confidentiality protection for permit-reported information and data see Nigel Bankes "Claims to Copyright Trumped by Expiration of Statutory Confidentiality Period" (8 May 2017) (online ed: ABlawg.ca, University of Calgary, Alberta).

VII Limited Protection for Information – Does Public Access to Information Stop Resource Development?

As noted, study of the CMA's regime raises normative and legal questions about how geothermal resources are managed, about the use of information holding periods and also about resource tendering, compliance auditing powers and royalty gathering.[129] Several points in support of greater public access to geothermal resource information and data are briefly discussed below.

The state upgraded the CMA's information provisions for economic and energy security reasons. It is arguable that the same justifications apply to reform information provisions in geothermal resource management law.

The CMA regime shows that limited information holding periods for commercially sensitive data and information produced under permits does not stop private development of the resource: they enhance it. Public access to petroleum resource information is a norm internationally and the CMA's 2013 amendments aligned with this. The Act's prospective exploration permit category also related to the CMA's timelines for release of information and data to the public. Multiple petroleum exploration permits can be issued for the same area, creating competition for resource information in the private domain (which eventually becomes public) and competition for resource development. Public tender or cash bidding create competition for development and for a "best work programme". Geothermal resources management in contrast has no holding periods for commercially sensitive resource information and data and no resource allocation tendering.

Because geothermal resource management peer review panels (PRP) cannot truly audit resource consent compliance for the reasons described in chapter four and because substantive information and data never becomes publicly available under a resource consent, public access to resource consent information and data (after 5 years) could act to strengthen geothermal management. Alternative technical models might be developed through the wider research community's access to relevant information and data. Research could be undertaken for future energy planning and to explore best future uses, including at the end of a resource consent period. Under the CMA, the (now) extensive auditor powers can request *any* information

[129] For research on the potential application of geothermal resource royalty provisions in New Zealand, see Sam Malafeh and Basil Sharp "Role of Royalties in Sustainable Geothermal Energy Development" (2015) 85 Energy Policy 235-242. See further Sam Malafeh "Economic Development of Geothermal Resources: Property Rights and Policy" (Doctoral Dissertation (economics), University of Auckland, 2013).

relating to a permit holding, including commercial agreements to which the permit holder is a party. In a geothermal auditing context, this could mean that the Bay of Plenty Regional Council would have access to "internal operator agreements" between consent holders under the Kawerau geothermal System Management Plan. Although the CMA auditor powers are applied for energy planning, risk management and financial (royalty return calculations), rather than sustainable management considerations—as would be the case in geothermal resource management—from a normative and environmental perspective, a sustainable management argument for full access to information and data by regulators (and ultimately by the public) may be equally strong. Related to this are confidentially held central government records and data from historical, tax-payer funded geothermal exploration.[130] Yet central government — the majority shareholder in Mercury Energy Ltd (the largest geothermal consent holder on the Kawerau system and the proprietary owner of the system's "master" model) —does not release this information and data into the public domain. If doing so would ultimately create more sustainable management of the resource, should the government be obliged to disclose such information to the public? Does its lack of disclosure create an unfair advantage in geothermal resource development?

Chapter four showed that regional councils struggle to interpret official information law in respect to geothermal resource consent generated information and data. Ombudsman guidance stresses that when assessing commercial confidentiality claims and whether public interest claims to officially held information outweigh them, decision-makers should consider: [131]

- to what extent the agency can verify the accuracy of the information supplied;
- if the supplier were to provide inaccurate or incomplete information, would the agency be able to identify that this has occurred; and,
- whether the agency is reliant on the supplier providing information in addition to that which can be compelled under statute.

These considerations are highly relevant to information and data supplied to regional councils under geothermal resource consents because the supply and accuracy of these is largely a matter of trust and rely on a collegial relationship being maintained between the regulator and

[130] See Waikato Regional Council *Regional Policy Statement* (2000) at [3.7]. (Note this was the Waikato Regional Council's first-generation regional policy statement). Regarding government joint ventures and government fiduciary duties see Raybon Kan *Confidentiality and Abuse of Discretion: Legal Aspects of the Information Flow Between Government and Private Sector in New Zealand's Petroleum Industry* (prepared for the Energy and Natural Resources Law Association of New Zealand Inc, 1989).

[131] Office of the Ombudsman *Confidentiality: A Guide to section 9(2)(ba) of the OIA and section 7(2)(c) of the LGOIMA* (November 2020) at 12.

regulated. As the geothermal peer review *Efficacy Report* identified in chapter four, regulators can also rely on consent holders to "go the extra mile" in the supply of information which is not legally required under a resource consent but which helps the regulator (and the peer review panel (PRP)) gain a broader understanding of resource consenting monitored issues.[132] Compared to the strict legal measures for petroleum resource management, these aspects of geothermal resource management are concerning. Regional councils' lack of certainty in interpreting official information law could be remedied through a policy of public access to geothermal resource information and data generated under resource consents.

Finally, the Overseer model showed the danger of modelling where a model is not independently peer reviewed for its fitness for purpose as a regulator tool. In the same way that Overseer was initially developed for private farm nutrient loss measurement, a geothermal consent holder will develop a model for private, commercial purposes not for regulatory purposes. If the public cannot have access to geothermal resource consent holder generated information and data about resource use (after suitable holding periods) and current PRPs cannot truly audit resource consent compliance (and for example run alternative models), it is arguable that either geothermal information and data should be publicly accessible or that geothermal development models should be publicly owned. Energy security, clean energy and climate change considerations are public not private concerns. Private companies make considerable profits from geothermal development projects and because they invest substantially in them (in up-front costs especially), they need to. But *how much* profit do such companies need to make to be commercially viable to cover their initial development and running costs? As recognised when the royalty provisions of the Geothermal Energy Act 1953 were subsumed into the RMA (see chapter three), the publicly owned geothermal resource is economically valuable. How much more valuable is the resource now, when the real effects of global warming are being revealed?[133]

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[132] Graeme Emerson and Brian Maunder *Geothermal Peer Review Panel – Efficacy Review* (report to the Waikato Regional Council, WRC#1995581, 2011) at [4.1].

[133] For example, see United Nations Intergovernmental Panel on Climate Change *Climate Change 2022: Impacts, Adaptation and Vulnerability* (Summary for Policy Makers) (Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Switzerland, March 2022). For a valuable overview and discussion of environmental principles affecting natural resource decision-making in New Zealand, including the distributive and public interest industries principles, see Gregory Darren Severinsen "The Environmental Regulation of Marine Carbon Capture and Storage in New Zealand: Principles, Barriers and Gaps" (Doctoral Dissertation, Victoria University of Wellington, 2017) chapter 3.

Just as a re-evaluation may be needed of the government's unilateral decision-making about petroleum resource development (and where its economic benefits accrue), the same may be said of geothermal resource development.

VIII Securities Law Information Requirements and International Resource Reporting Codes – Petroleum Resources

A Petroleum Mineral Reserves Reporting and Risk Disclosure Obligations

The CMA's purpose and the Minister's functions promote resource development and sound investment decision-making and market functions. This section therefore covers securities law information requirements particular to publicly listed petroleum mining companies because raising capital on the stock exchange is the traditional mainstay of mineral exploration funding.[134] The CMA recognises that mineral resource reporting provides key information to manage petroleum resources.[135] To that end, information and data provided by permit holders (and applicants) informs resource allocation decisions and provides inputs into resource and market forecasts. The CMA itself does not include information-reporting provisions for public investment purposes; however, subsidiary regulations (or minerals programmes) incorporating securities law do.[136] Securities law governs how financial products are created, promoted and sold and the ongoing responsibilities of those who offer, deal and trade in them.[137]

In New Zealand, securities law information provisions are within the Financial Markets Conduct Act 2013, Financial Markets Conduct Regulations 2014 and the New Zealand Stock Exchange (NZX) *Listing Rules*.[138] A survey of securities law information provisions shows how information disclosure protects and informs public investors. Public investors can be considered as multilateral interests that are functionally part of the natural resource bargain

[134] Barton (2019), above n 12, at 936.

[135] For example, CMA 1991 ss 2B and 90; Crown Minerals (Royalties for Petroleum) Regulations 2013; and NZPAM *Petroleum Programme* (2013), above n 20, at [9.6], [10.2] and [11.3].

[136] CMA 1991 s 105C(1)(a). See NZPAM *Guidance for Resource and Reserve Reporting for Tier 1 Permits* (June 2017) at <www.nzpam.govt.nz/assets/Uploads/permits/minerals-guidelines/guideline-resource-reserve-reporting-tier-1-permits.pdf>. Tier 1 (petroleum) permits must use either one of three reporting codes, one being the *JORC Code* (2012) which is generally referred to throughout the guidelines. The New Zealand Stock Exchange *Listing Rules* (10 December 2020) appendix 4 Mining Issuer Disclosure Rules primarily refer to the *JORC Code* (2012), see further below.

[137] MBIE *Review of Securities Law: Discussion Paper* (June 2010) at [8]; and Financial Markets Conduct Act 2013 ss 7 and 8.

[138] Other related legislation and regulations include the Companies Act 1993; Financial Market Authority Act 2011; and Financial Reporting Act 2013. New Zealand Stock Exchange *Listing Rules* (NZX *Listing Rules*) (10 December 2020) are found at <www.nzx.com/regulation/nzx-rules-guidance/nzx-listing-rules>.

because their capital investment often funds petroleum development. The same can be said of public investors in geothermal resource development.

Mineral resources are a special problem for a securities law system based on information disclosure because, by their nature, mineral deposits are hidden underground and it can take years of exploration effort to find them and determine whether they are present in sufficient quantity, accessibility and metallurgy for a profitable mine to be built.[139] The reporting of resources assists the effective working of downstream markets by improving the transparency of the supply-side of the market.[140] Mineral resource and mineral reserve estimates impact the financial market's view of a mining company and its projects, including factors such as the likelihood of development of a mining project; fundamental valuation metrics such as net present value; future cash flows; historical financial results; and financial statements.[141] As well as accurate resource information, investors must also be informed of the likelihood and type of risks (for example, environmental law or regulatory changes) which could negatively impact the value of a company's security offering. Publicly listed companies therefore must also fulfil *ongoing* information disclosure obligations in order to inform existing and prospective shareholders of developments affecting their shareholding.[142]

New Zealand's Financial Market Authority (FMA) is a Crown Entity whose main objective is to promote and facilitate fair, efficient and transparent financial markets.[143] The Financial Markets Conduct Act 2013 is the legal instrument through which the FMA performs its role and through it provides for "timely, accurate, and understandable information to be provided to persons to assist those persons to make decisions relating to financial products" and for "appropriate governance arrangements" to apply to financial products that allow for effective monitoring and reduce governance risks.[144] The NZX is the primary operator of securities markets in New Zealand. It is responsible for developing market rules, practices and policies

[139] Barton (2019), above n 12, at 943.

[140] Cabinet Paper (n.d), above n 33, at [16] – [17].

[141] Mark T Bennett and Myroslav Chwaluk "Mineral Resource and Mineral Reserve Reporting Standards and Liability for Disclosure in Leading Capital Markets" (2008) 54 Rocky Mt Min L Inst 28C-1 (46).

[142] Financial Markets Conduct Act 2013; and Financial Market Conduct Regulations 2014; NZX *Listing Rules* (2020), above n 138, at 49 – 65 requires disclosure information and continuous disclosure-material information.

[143] Financial Markets Authority Act 2011 ss 7 and 8.

[144] Financial Markets Conduct Act 2013 s 4(a) and (b).

under which its markets operate and for monitoring and enforcing rules under which the NZX market operates.[145]

A common source of initial funding for petroleum developments is by an initial public offering. Here an issuing company prepares a product disclosure statement (a prospectus) and makes an application to list its offering on the stock exchange. Under the Financial Markets Conduct Act 2013, certain information must be disclosed in a product disclosure statement, including the purpose and key terms of the offer, key products featured and risks associated with them.[146] For example, a company's reported estimate of a petroleum resource is a key product that affects the economic value of a company's offering, while health and safety, environmental and regulatory risks are considered as risks associated with the offering.[147]

In addition to the generally applicable *Listing Rules* for publicly listed companies which apply to publicly listed petroleum mining companies, the NZX adopted the *JORC Code* in its *Listing Rules*.[148] The JORC Code's long title is *The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves.*[149] The NZX *Mining Disclosure Rules* apply both to an initial offering and to the ongoing (continuous) disclosure obligations of a petroleum mining company under the CMA.[150] Continuous disclosure is a disclosure framework that seeks to ensure the timely release of material information by issuers so that the integrity of the market is maintained. This framework primarily ensures that the market is informed of relevant information. Equality of access to information is promoted so investors can make informed decisions and a fair, orderly and transparent market is promoted.[151]

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[145] See New Zealand Stock Exchange *Regulations* at <www.nzx.com/regulation/nzregco>.

[146] Financial Market Conduct Act 2013 Part 3 ss 39, 48 and 57. Financial Market Conduct Regulations 2014 Part 3 cl 23; see also cls 20 – 36.

[147] See also NZX *Listing Rules* (2020), above n 138, appendix 1 Corporate Governance Code principle 4, Reporting and Disclosure, Non-Financial Reporting concerning environmental, social and governance factors (ESG); see further, New Zealand Stock Exchange *Guidance Note, NZX ESG Guidance* (10 December 2020) at <www.nzx.com/regulations/nxz-rules-guidance/corporate-governance-code>.

[148] NZX *Listing Rules* (2020), above n 138, Mining Issuer Disclosure, appendix 4.

[149] See *The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* (*JORC Code*) (2012, 12th ed) at <www.jorc.org/docs/JORC_code_2012.pdf>.

[150] NZX *Listing Rules* (2020), above n 138, appendix 4 Mining Issuer Disclosure at [1.1.1].

[151] New Zealand Stock Exchange *Guidance Note: Continuous Disclosure* (2020) at [1].

B International Resource Reporting Codes – Petroleum

The *JORC Code* (or the *Code*) is an Australasian code for standardised reporting of exploration results, minerals resources and ore reserves. It sets out minimum standards, recommendations and guidelines for public reporting in Australasia.[152] Under NZX *Listing Rules*, a mining issuer must give to NZX "within one month after the end of each calendar year quarter a report providing all the information prescribed by NZX together with full details of production, development and exploration activities (including geophysical surveys) and expenditure incurred thereon".[153] Such reports must comply with the *JORC Code* and be issued by a "competent person" as required and defined in the *Code*.[154] This requirement aligns with the principles governing securities disclosure and the principles of the Code ie transparency, materiality and competence.[155]

According to the *JORC Code*, competence requires that public reports are "based on work that is the responsibility of suitably qualified and experience persons who are subject to an enforceable professional code of ethics".[156] Transparency requires that the reader of a public report is "provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and not be misled by this information or by omission of material information that is known to the Competent Person".[157] Finally, materiality requires that a public report contains "all the relevant information that investors and their professional advisers would reasonably require, and reasonably expect to find in the report, for the purpose of making a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Ore Reserves being reported".[158] The Competent Person therefore must provide explanatory material on the material assumptions underlying a declaration of results for exploration, mineral resources or ore reserves. A company issuing the public report (as part of

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[152] Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia, *JORC Code* (2012), above n 149, at [1]. First published in 1989 the JORC Code was produced as part of a worldwide initiative for widespread adoption of consistent mineral reserve reporting standards.

[153] NZX *Listing Rules* (2020), above n 138, appendix 4 Mining Issuer Disclosure at [1.1.4]. See further, JORC Code (2012) reporting requirements including general reporting, reporting of exploration results and reporting of mineral resources at [13] – [28] and at Table 1 checklist of assessment and reporting criteria at [26] – [35].

[154] NZX *Listing Rules* (2020) appendix 4 Mining Issuer Disclosure at [1.3.6]; and JORC Code (2012) at [9] – [11].

[155] *JORC Code* (2012), above n 149, at [4].

[156] At [4]. The qualifications and experience of a Competent Person are further defined and explained at [11]. See further at <www.jorc.org/competent/>.

[157] At [4].

[158] At [4].

its initial securities offering or under continuous disclosure obligations) must disclose the name of the Competent Person, whether the person is a full-time employee of the company and, if not, name the person's employer. Any potential for a conflict of interest must be disclosed publicly and also any other relationship the Competent Person has with the company making the report.[159]

Furthermore, technical reports must include steps taken by the qualified person to verify data in the reports, including procedures and limitations on or failure to conduct verification and the qualified person's opinion on the adequacy of the data.[160] While full and accurate disclosure in mining reporting standards is required, the *JORC Code* recognises that for some public reports it is appropriate to exclude some commercially sensitive information. A decision to exclude commercially sensitive information is a decision for the company reporting; however, the decision must be made in accordance with any relevant superseding regulations.[161]

Again, using Canada as an example of international harmonisation of petroleum development law, the Canadian Institute of Mining Metallurgy and Petroleum (CIM) has created standards of disclosure for petroleum projects in Canada which are law by virtue of *National Instrument* (NI) *51-101*, established by the Canadian Securities Administrators.[162] The establishment of the *NI 51-101* means that all reporting petroleum development companies in Canada are subject to the provisions of *NI 51-101* in addition to any disclosure requirements required by the relevant stock exchange rules.[163] Where the *JORC Code* requires the Competent Person, the *NI 51-101* has a similar requirement and definition in a "qualified reserves evaluator".[164]

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[159] At [9].

[160] *JORC Code* (2012), above n 149, Table 1 section 1 sampling techniques and data; and verification of sampling and assaying at [27].

[161] Table 1 checklist of assessment and reporting criteria at [26].

[162] The NI 51-101 was established in 2003. See the Canadian Securities Administrator *Access Rules and Policies* at <www.securities-administrators.ca/industry_resources.aspx?id=47>. A copy of NI 51-101 can be found under regional security commissions, for example, British Columbia Securities Commission at <www.bcsc.bc.ca/search#sort=Relevance&term=51-101>.

[163] See NI 51-101 *Standards of Disclosure for Oil and Gas Activities* at [1.3], and [2.1(1) and (2)]. See also Toronto Stock Exchange (TSX) *Listing Guides* for "Oil & Gas Companies" where the NI 51-101 is required, at <www.tsx.com/listings/listings-with-us/listing-guides>.

[164] See NI 51-101 *Standards of Disclosure for Oil and Gas Activities* at [1.1(y)(i) and (ii)]; the Canadian Securities Administrator (CSA) provides further information on terms used in the NI 51-101, see CSA Staff Notice 51-324 *Revised Glossary to NI 51-101 Standards of Disclosure for Oil and Gas Activities*. Further the CSA mandates the *Canadian Oil and Gas Evaluation Handbook* as the technical standard for NI 51-101 which is maintained and distributed by the Society of Petroleum Evaluation Engineers, see <www.albertasecurities.com/issuer-regulation/oil-and-gas>.

For mining companies operating in public capital markets, reporting mineral resource and reserve estimates carries the risk of significant liability for market participants that may have no intent to defraud investors but which may nevertheless attract liability through misleading or otherwise defective statements that arise from reports that are by definition uncertain and based on imperfect information.[165] Overall, securities law disclosure requirements for minerals and energy resource reporting are growing internationally, including in New Zealand.[166] The adoption of internationally recognised reporting standards in major capital market jurisdictions through national standards of professional associations, applicable securities laws and stock exchange rules has been an ongoing effort of many groups, including professional organisations, lawyers, public companies. For example, the *Committee for Mineral Reserves International Reporting Standards* (*CRIRSCO*) in mining resource disclosure established in 1994 has membership in most of the critical mining and finance countries globally and there are a number of codes for minerals disclosure around the world.[167] Importantly, the *CRIRSCO* combined the efforts of professional organisations and is now a task force with the mandate of promoting a minimum mineral reserve standard internationally.[168] The *JORC* Committee is a member of *CRIRSCO* and works closely with it in the development of reporting standards and promotion of best practices.[169]

Another international system emerging for resource classification is the *United Nations Framework Classification for Resources* (*UNFC*) which attempts to harmonise the classification of resources globally.[170] The *UNFC* is now discussed in relation to geothermal resource reporting and its potential application in New Zealand.

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[165] Bennett and Chwaluk (2008), above n 141, at 5.

[166] See for example CMA 1991 s 105C; Financial Reporting Act 2013; Financial Markets Conduct Act 2013; and Financial Markets Conduct Regulations 2014. See also MBIE *Responsibly Delivering Value – A Minerals and Petroleum Resource Strategy for Aotearoa New Zealand: 2019 – 2029* (November 2019) at 23, regarding improved information disclosure requirements for the gas industry (Gas Act 1992).

[167] Much of the current disclosure required of the mining industry is derived from *CRIRSCO* standard definitions, such as inferred resource, probable resource and proved resource. See Brian E Abraham "Global Mining Resource Disclosure" (16 March 2020) at <www.lexology.com/library/detail.aspx?g=b9c577e4-f37d-4d4f-87a2-c3df79cea39e>. See *CRIRSCO* International Reporting Template for the public reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves (November 2019) at <www .crirsco.com/docs/CRIRSCO_International_Reporting_Template_November_2019.pdf>.

[168] Bennett and Chwaluk (2008), above n 141, at 4.

[169] See < www.jorc.org>. Note the *JORC Code* (2012), above n 149, parent document is the CRIRSCO template.

[170] See generally United Nations Economic Commission for Europe (UNECE) United Nations Framework Classification at <www.unece.org/sustainable-energy/unfc-and-sustainable-resource-management>; and UNECE *United Nations Framework Classification for Resources* (Update 2019, ECE Energy Series No. 61, Geneva 2020). A bridging document between the CRIRSCO reporting template and the UNFC was developed in 2015; see

IX International Resource Reporting Codes – Geothermal Resources

Unlike petroleum resource development, industrial-scale geothermal resource development has been both slower to begin and slower to formulate an internationally applicable code for public reporting of geothermal resources. Geothermal resources are generally used locally (ie unlike petroleum resources not exported) so, although geothermal industry services are exchanged internationally (technical expertise), development companies and the resource "product" are typically local. However, as the need to develop renewable energy sources increases and the technology to do so improves and changes, the need for public funding to develop resources grows. Consequently, this section examines the use of international codes for geothermal resource reporting and situates the usefulness of an internationally recognised reporting code within New Zealand's overall geothermal resource management regime and its accompanying legal requirements for information to manage the resource.

The following sections review the *Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves* (*AGRC*)[171] and then the *UNFC Geothermal Specifications* and their application in New Zealand.[172]

A Australian Geothermal Reporting Code

The Australian Geothermal Energy Association and the Australian Geothermal Energy Group jointly produced the *AGRC*.[173] The *AGRC* was a world-first for public reporting of geothermal resource data, and being closely based on the *JORC Code* (2004),[174] was supported by the JORC Committee. The *AGRC* was designed as a formal regime for stock exchange listed

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UNECE *Bridging Document between the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template and the United Nations Framework Classification for Resources (UNFC)* (Geneva, 2015). For an overview of the application of the UNFC at country level see T Bide, TJ Brown, AG Gunn and E Deady "Development of Decision-making Tools to Create a Harmonised UK National Mineral Resource Inventory using the United Nations Framework Classification" (2022) 76 Resources Policy 102558.

[171] *Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves: The Geothermal Reporting Code* (*AGRC*) (2nd ed, 2010) at <www.dmp.wa.gov.au/Documents/Geological-Survey/Geothermal_Reporting-Code_Ed_2.pdf>.

[172] United Nations Economic Council for Europe, United Nations Framework Classification for Resources, *Specifications for the application of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009) to Geothermal Energy Resources* (*UNFC-Geothermal Specifications*) (Geneva, 30 September 2016) at <www.unece.org/sustainable-energy/unfc-and-sustainable-resource-management/unfc-and-geothermal-energy>. See also research conclusions by Bart Van Campen "The Use of Geothermal Reservoir Modelling and Resource Assessment in Geothermal Regulation and Sustainable Resource Management" (Doctoral Dissertation, University of Auckland, 2022) chapter 5.

[173] *AGRC* (2010), above n 171.

[174] *JORC Code* (2012, 12th ed) first published in 1989, above n 149.

companies to make reports to the market. A crucial facet of the *AGRC* was that any public report by a development company must be signed off by a Competent Person before the report's release. Although the Australian Stock Exchange (ASX) supported the *AGRC*, it did not move to formally create rules for its application.[175] Nor does the ASX currently list specific disclosure rules for publicly listed geothermal development companies.

Investment in geothermal development for electricity production in Australia has stalled considerably in recent years, although direct use continues to grow.[176] Notwithstanding, the *AGRC* and its accompanying *Lexicon for Resources and Reserves Definitions and Reporting* provided a world-first uniform guide on how to report geothermal resource data to the market.[177]

As Lawless, Ward and Beardsmore explained, part of the delay in standardised reporting of geothermal reserves and resource reporting was because parties responsible for geothermal project development were initially often large utilities or government agencies which were not raising funds through stock market listings. In Australia however, a reliance on stock market funding drove the Australian industry to develop a regime to make public reports on their value-driving assets (their geothermal resources and reserves) that were acceptable to market and investment regulators, investors and non-market financiers. Several reasons drove the moulding of the *JORC Code* to geothermal resources, including that mineral sector investors internationally were familiar with *JORC* reporting and the desirability of minimising new terminologies and concepts. The *JORC Code* had also been developed and revised over two decades and was found to be very robust.[178]

In the years immediately after its creation, experience with the *AGRC* in Australia revealed a number of issues: a lack of appreciation of the reporting protocol such as the need to include a Competent Person's statement with every public report (a common practice in the Australian mineral industry); the very brief technical details given in public reports, with very large

[175] AF Williams and others "A Code for Geothermal Resources and Reserves Reporting" (from proceedings, World Geothermal Congress, Indonesia, April 2010).

[176] See Graeme Beardsmore and others "Australia – Country Update" (from proceedings World Geothermal Congress, Iceland, 2020) at [1.4].

[177] Australian Geothermal Energy Group Geothermal Code Committee *Geothermal Lexicon for Resources and Reserves Definition and Reporting* (2nd ed, 2010). Gioia Falcone and Graeme Beardsmore "Including Geothermal Energy with a Consistent Framework Classification for Renewable and Non-Renewable Energy Resources" (from proceedings World Geothermal Congress, Australia, April 2015) at [2.7].

[178] JV Lawless, M Ward, and G Beardsmore "The Australian Code for Geothermal Reserves and Resources Reporting: Practical Experience" (from proceedings World Geothermal Congress, Indonesia, April 2010).

numbers being quoted for energy in place in inferred resources (misleading to investors); and the lack of an incorporated professional body with an enforceable code of ethics to which Competent Persons publicly reporting on geothermal resources could belong.[179] It is likely that without legal backing for the application of a similar reporting code in New Zealand, experience would show similar results. New Zealand's central government was initially responsible for researching, funding and developing geothermal resources. Although the government is still a majority shareholder of one geothermal developer company, geothermal resource development has long been privatised and equity for geothermal development is typically raised via public share offer via the NZX and ASX, neither of which have geothermal-specific reporting requirements.[180]

Canada was a keen adoptee of the *AGRC* and in 2010 created its own version, *The Canadian Geothermal Code for Public Reporting*.[181] Although not endorsed by the Canadian securities exchanges or any other regulator involved in Canadian securities regulation, Canada's *Code* was intended to apply to all forms of public reporting.[182] However, Canada, like Australia, is now turning towards the *UNFC Geothermal Specifications* for geothermal resource reporting.[183] Canada, Australia, New Zealand and many countries worldwide all have geothermal development associations which affiliate internationally to the International Geothermal Association (IGA). The IGA supported the *AGRC*. However, the IGA's later reassessment of options in light of the *UNFC (2013)* led the IGA's decision to harmonise geothermal resource reporting with all other resources in line with the *UNFC*.[184] Although the *AGRC* cannot be used in conjunction with the *UNFC Geothermal Specifications*, the *AGRC's Lexicon for Resources and Reserves Definitions and Reporting* (2010) contains useful advice for quantifying geothermal resources.[185]

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[179] Lawless, Ward and Beardsmore (2010), above n 178, at 2-3.

[180] See for example (n.a) "Contact to Raise $400m to Build Tauhara, Lifts Half-year Profit" *New Zealand Herald* (15 February 2021).

[181] Canadian Geothermal Code Committee *Canadian Geothermal Code for Public Reporting* (2010).

[182] At 4.

[183] Personal communication with Alison Thompson, CanGEA co-founder and chair (April 2021). Note however that CanGEA yet lists the *Canadian Code for Public Reporting* at <www.cangea.ca>.

[184] Personal communication with Dr Graeme Beardsmore, University of Melbourne (May 2021). See further United Nations Economic Commission for Europe (UNECE) "UNFC and Geothermal Energy" at <www.unece.org>.

[185] Personal communication with Beardsmore (2021), above n 184. Note Beardsmore advises against formalising any requirement to use the *Lexicon* with the *UNFC* because the *Lexicon* refers explicitly to the *Australian Geothermal Reporting Code* in many places.

Although one benefit of New Zealand's adopting the *AGRC* would be that it is based on the *JORC Code* framework with which New Zealand is already familiar under petroleum reporting requirements and related securities law, the *AGRC* is no longer an updated, "live" document.[186] Furthermore, unlike in the petroleum and hard rock mineral development industries where technical experts may fairly readily transfer their skillsets, a transfer of technical expertise in petroleum and minerals development to the geothermal development industry is (historically, at least) less common. Furthermore, a minerals-based code could be more complicated than necessary.[187] Therefore, adoption of the *AGRC* has fewer advantages than might be supposed.

B United Nations Framework Classification: Geothermal Specifications

The *UNFC* is described as "a universally acceptable and internationally applicable scheme for the sustainable management of all energy and mineral resources."[188] The *UNFC* is a live (evolving) document which provides specifications, guidelines and best practices for all energy and minerals sectors. Furthermore, in 2016 in conjunction with the IGA, *Geothermal Specifications* for the application of the *UNFC* to geothermal resources were developed.[189]

The *UNFC Geothermal Specifications* state that relevant national, industry or financial reporting regulations may require a resource evaluator to have specific qualifications and/or experience and that regulatory bodies may explicitly mandate the use of a Competent Person, as defined by regulation in respect to corporate reporting.[190] In support of this suggestion, the *UNFC's Guidance Note on Competent Person Requirements and Options for Resource Reporting* provides help for those (such as governments and financial institutions) wishing to establish quality assurance mechanisms, qualification criteria and/or disclosure obligations that can be adopted in circumstances where competency requirements are desirable.[191] Currently, there is no mechanism worldwide for certifying Competent Persons for geothermal resource assessment and reporting; nor is membership of any specific professional body mandatory.

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[186] Brian Maunder "Geothermal Resource Estimation: Waikato Region – A Discussion Paper" (prepared by Earth Consult for Waikato Regional Council, 2014).

[187] At [3.1].

[188] See UNECE "UNFC and Sustainable Resource Management" at <www.unece.org/sustainable-energy/unfc-and-sustainable-resource-management>. See also Falcone and Beardsmore (2015), above n 177.

[189] UNECE, UNFC *Specifications for the application of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009) to Geothermal Energy Resources* (Geneva, 30 September 2016) at 3.

[190] At [L], and "resource evaluator" at glossary of terms.

[191] UNECE, Expert Group on Resource Classification *Guidance Note on Competent Person Requirements and Options for Resource Reporting* (May 2017) at summary.

However, the IGA is exploring Competent Person certification, given it is becoming a live issue for countries whose securities regulators are looking to formally adopt the *UNFC* framework and supporting instruments.[192]

Internationally, the application of the *UNFC Geothermal Specifications* to geothermal resources at country-level is being developed to provide clarity to investors, regulators, governments and consumers.[193] In 2017, the United Nations Economic Council for Europe (UNECE) and the IGA carried out a number of global case study applications of the *UNFC Geothermal Specifications*, including at the Ngatamariki geothermal system[194] in New Zealand's Waikato Region.[195] While New Zealand has not adopted the *UNFC Geothermal Specifications* (or made a country-wide *UNFC* assessment of its geothermal resources), an additional case study applying the *UNFC Geothermal Specifications* was also made of the Ohaaki geothermal field in 2019 and nation-wide application of the *UNFC Geothermal Specifications* has been proposed.[196]

Based on this chapter, the Table below (Table 7.1) provides a summary overview of the information-related provisions of petroleum resource management law compared to geothermal resource management law. The Table illustrates the stark difference between management of the two energy resources and poses the question: should the legal regimes to manage two nationally important, publicly owned energy resources continue to be managed so differently?

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[192] Personal communication with Beardsmore (2021), above n 184.

[193] The International Renewable Energy Agency (IRENA) is also working with the Global Geothermal Alliance (of which New Zealand is a member country) and the World Bank to classify geothermal resources at country-level, see <www.irena.org/newsroom/articles/2018/Apr/IRENA-IGA-and-World-Bank-Team-Up-to-Streamline-Geothermal-Energy-Development>. See Global Geothermal Alliance, at <www.globalgeothermalalliance.org/>.

[194] See information about Ngatamariki energy developments at <www.nzgeothermal.org.nz/geothermal-in-nz/nz-geothermal-fields/ngatamariki/>.

[195] UNECE *Application of the United Nations Framework Classification for Resources (UNFC) to Geothermal Energy Resources: Selected Case Studies* (United Nations, New York and Geneva, 2017) at 2-5, at <www.unece.org/sustainable-energyunfc-and-sustainable-resource-management/unfc-and-geothermal-energy>. See also International Geothermal Association (IGA), at <www.geothermal-energy.org/about/iga-story/>. The International Energy Agency (of which New Zealand is a member country) has a Geothermal Technical Collaboration Programme, members of which also collaborated on the *UNFC Geothermal Specifications* and IGA case study in New Zealand, see <www.iea-gia.org/unfc-geothermal-resource-classification-case-studies-reports/>.

[196] Bart Van Campen, Rosalind Archer and David Grinlinton "Ohaaki Resource Assessment in UNFC-2009 Framework and Proposal" (from proceedings New Zealand Geothermal Workshop, November 2019).

Table 7.1 Information-related Requirements for Petroleum and Geothermal Resource Management Compared

LEGISLATIVE PROVISION, POLICY OR RULE	PETROLEUM	GEOTHERMAL
Central government management	Yes	No
Commercially valuable resource information and data made publicly available in order to encourage resource development/improve resource development decision-making	Yes	No
Independent third-party auditing of information/data supplied by permit holder/resource consent holder	Yes	No
International standard for resource reporting	Yes	No
Resource-specific securities law obligations for public listing and ongoing disclosure	Yes	No
'Competent Person' resource reporting requirements	Yes	No
• Professional association required for technical reviewers	Yes	No
• Public conflict of interest register for technical reviewers	Yes	No
Centralised (government) resource information and data repository	Yes	No
Public access to historical, publicly funded resource information and data on petroleum and geothermal resources	Yes	No
Royalties accrued for private resource development	Yes	No
Resource allocation tendering	Yes	No
Valuable, publicly-owned non-renewable / renewable energy resource	Yes	Yes

New Zealand's central government agencies are increasing their interest in the strategic value of geothermal energy resources. In 2020, the Ministry of Business, Employment and Innovation (MBIE) in consultation with Transpower (the state-owned electricity transmission network) commissioned a report to present estimations about the possible timing and cost of future geothermal electricity development projects in New Zealand over a 40-year period to assist MBIE in updating its electricity forecasting and planning for future transmission requirements.[197] Furthermore, in 2021 the Climate Change Commission draft report for consultation made recommendations for greater use of geothermal resources in maximising the use of electricity from renewables for process heat and low emissions electricity for electric vehicles.[198] The Commission's final report noted that the lack of a government-led national energy strategy meant a lack of coordinated approach to support low-emissions technologies, fuels and industries. A national energy strategy would coordinate different aspects of the energy system, including future energy developments, system reliability, infrastructure needs and emissions reductions.[199]

Increasing New Zealand's use of renewable geothermal resources within the bounds of a national energy strategy should move regulators towards creating greater certainty for investors in renewable energy development and particularly associated environmental and investment-related risks. The Climate Change Commission notes geothermal development's particular emissions intensity compared to that of other renewables and for geothermal development's "potential to come into conflict with the resource management system".[200] While geothermal development companies broadly outline regulatory and resource management risks associated within their disclosure prospectuses, emissions information per se is typically absent. The NZX *Listing Rules'* best practice *Corporate Governance Code* notes that reporting frameworks for environmental, social and governance factors are increasingly commonplace for stock exchangers worldwide.[201] Unlike the strict legal requirements for reporting of petroleum

[197] Jim Lawless, Bart van Campen, and Jim Randle *Future Geothermal Generation Stack* (Lawless Geo-Consulting report for the Ministry of Business, Innovation and Employment, March 2020). See also Jim Lawless, Bart van Campen, and Jim Randle "Future Geothermal Generation Stack: Factors Influencing New Geothermal Projects in NZ to 2060" (from proceedings New Zealand Geothermal Workshop, November 2020).

[198] Climate Change Commission *Climate Change Commission 2021 Draft Report for Consultation* (January 2021) at 14 and 15.

[199] Climate Change Commission *Inaia Tonu Nei: A Low Emissions Future for Aotearoa* (May 2021) at 277.

[200] At 113 and 281-282.

[201] NZX *Listing Rules* (2020), above n 138, appendix 1 NZX Corporate Governance Code, at 21. See for example Contact Energy Ltd's reference to ESGs in *Growing. Investing. Leading: Integrated Report 2021* (Contact Energy Ltd, August 2021) at 36.

resource information (particularly information which feeds into resource development planning, energy security planning and Competent Persons/risk considerations), geothermal resource planning, reporting and disclosure rules need updating to reflect the growing importance of geothermal energy development in a decarbonising world.[202]

X Key Points

Overall, the key drivers of the CMA's 2013 amendments were the state's joint-venture-like partnership with petroleum developers through its receipt of royalty payments for developed resources and its desire to improve New Zealand's energy security. Amendments lifted the pre-2013 provisions for permit-holder information to international standards primarily through: requiring international standards for resource reporting; limiting non-disclosure time periods for officially held commercially sensitive information and data (ie increasing public access to resource information); through securities law rules for internationally standardised resource reporting, including Competent Person rules; and through substantially increasing permit compliance auditing and enforcement powers of independent auditors. New legal requirements for permit holders to use international resource reporting standards decreases investor and shareholder risks and promotes resource development. Furthermore, the competent person requirements within the *JORC Code*, securities law and the *Code's* adoption by the NZX now support this.

While the 2013 amendments improved permit-holder information requirements providing for Māori rights and interests in petroleum development through iwi engagement reports and permit-holder engagement reporting to NZPAM, NZPAM's discretionary ability to unilaterally decide against area exclusion requests put forward by Māori may undermine such amendments.

Historically, compared to the geothermal resource management regime, the Crown's interest in petroleum resource development is primarily financially and energy-security driven. Petroleum resources are managed by central government with little regional input into decision-making and little financial return to regions in royalty payments distributed regionally. NZPAM also houses national, centralised data and information about petroleum resources—much of which is made publicly available. Given the significant investment in geothermal resource development projects, their projected increase and the considerable private profits

[202] From non-law disciplinary backgrounds, see Bart Van Campen and Rosalind Archer "Geothermal Resource Management and Reporting: Learning from (NZ) Petroleum Regulator Experience" (from proceedings European Geothermal Congress, France, September 2016).

made by geothermal developer companies, this research argues that the geothermal resource management regime should be similarly upgraded to reflect the resource's economic and particularly its energy security value as a renewable, publicly owned, base-load energy resource. Internationally, governments are increasingly turning to geothermal resources and to their unique, clean and stable energy characteristics. The *UNFC Geothermal Specifications* and *Guidance Note on Competent Person Requirements and Options for Resource Reporting* attest to this fact. As countries look to adopt the *UNFC Geothermal Specifications* to promote investment in geothermal resource development and energy security planning, the International Geothermal Association is also currently exploring internationally applicable Competent Person certification. In response to global energy issues, local energy demands and universal emissions reduction targets, real effort is being put into looking at geothermal resources in a new way.

With increased interest in geothermal resources' strategic role in energy planning, New Zealand's central government is also appraising geothermal resources in a new way, as shown in MBIE and the Climate Change Commission reports. The RMA's replacement and intended national strategic planning also feed into a reappraisal of geothermal resource management. Increased public and private investment in geothermal research and development and the growing internationalisation of geothermal resource development mean New Zealand's geothermal resource reporting is also growing in importance. The development of new technologies and new energy needs such as technology to exploit supercritical geothermal resources and the energy needs in powering data centres are also changing the historical geothermal development landscape. Central government needs accurate and reliable information and data for energy and infrastructure planning. Moreover, where private equity is sought for resource development, private investors want to be sure of their risk exposure.

The chapter raised practical and normative questions about public access to resource information and data produced under permits and resource consents and evaluated the petroleum regime's information provisions for holding periods for permit-holder-produced resource information. More broadly the chapter looked at how geothermal resource management information provisions might better reflect public functions of property in publicly owned geothermal resources. As a first developer of high-temperature geothermal resources worldwide in the early 1950s, New Zealand subsequently became a world leader in geothermal development technology and resource management. By aligning with international moves to standardise resource reporting and aligning New Zealand's petroleum and geothermal

resource management regimes by giving explicit effect to the *public* rather than *private* functions of property in publicly owned natural resources, New Zealand can continue to lead the way.

CHAPTER EIGHT

INSIGHTS AND RECOMMENDATIONS

I Introduction

This chapter synthesises insights from the three legislative regimes explored in the preceding chapters. Insights are discussed under themes drawn from a legislation comparison table (Table 8.1). Research insights provide answers to the thesis research question in the form of recommendations; research implications and areas for further research are suggested.

II Summary Observations

The research tells a clear story. Simply, it is a story which speaks of the state's role and intent regarding the management of natural resources in New Zealand. It is a story explored within the larger context of facts about the current state of Aotearoa's natural resources, broader physical environment and constitutional arrangements. Currently, government and independent reports and the literature all identify deficits in New Zealand's natural resource and environmental information base and fragmentation in research processes and information systems.[1] Perhaps this is unsurprising given that the neoliberal experiment in New Zealand has been considered the most ambitious attempt at constructing the free market as a social institution implemented by any country in the 20th century.[2] As the research has shown, neoliberalism's particular manifestation in natural resource management in New Zealand is characterised by certain assumptions: that private resource developers should be left to their own devices as much as possible; that government agencies should not take an active role in resource management themselves; and that government agencies should run on a "high-trust" model, without heavy-handed enforcement or endless red-tape compliance obligations. One possible gain from New Zealand's unique position as a world-leading experimenter in

[1] See for example Parliamentary Commissioner for the Environment *Focusing Aotearoa New Zealand's Environmental Reporting System* (*Focusing Aotearoa*) (November 2019); Ministry for the Environment *New Directions for Resource Management in New Zealand: Report of the Resource Management Review Panel* (*New Directions*) (June 2020); and Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand* (*Future of Commercial Fishing*) (February 2021).

[2] John Gray *False Dawn: The Illusions of Global Capital* (Granta Publications, London, 1998) at 39.

neoliberalist policy is that big experiments can offer big lessons. The lessons for legal information requirements in natural resources law are summarised in this final chapter.

Although the findings and implications of the research and suggestions to improve law have practical application within each regime examined, the research also informs New Zealand's wider natural resource and environmental management system. As a system currently undergoing major law reform, indicators show the substandard state of New Zealand's information and information systems and processes particularly in the area of environmental reporting and monitoring, strategic management and regulatory compliance and resource management connectivity. The multiple negative implications of this situation for Māori have also been demonstrated along with the need for mātauranga Māori and Māori themselves to play a greater role in natural resource management.

The research examined the respective information requirements under three legislative regimes and the state's role in granting rights to property in natural resources. Historical, political and ideological influences were identified as shaping the state's perception of the functions of property in natural resources—both its own, that of Māori and private functions of property-type rights in resources. Within the decade that the three examined statutes were enacted, the state's role changed from owner/developer to owner/manager, thus altering the public functions of property in nationally owned natural resources. Private property-type holdings in natural resources were granted by the state either at central government or regional level, which bestowed rights of considerable strength and duration to the benefit of private interests. Privatisation of resources, contracting out of state services and an increase in the use of regulation took effect. The impacts of these changes were explored by examining the substance of statutory and regulatory information requirements in relation to the natural resource bargain concept.

As a concept, the natural resource bargain preceded the privatisation era and the influence of neoliberal ideology in law. However, neoliberal ideology's influence strengthened the bargaining power of private interests in relation to the resource owner. Decades on, private interests have become imbedded in regulatory management structures through both the devolution of state functions and through a decentred understanding of regulation's role. While this is not necessarily problematic in itself, it has led to information, compliance and accountability issues. It has also meant that multilateral interests in natural resource management (and development) have been largely, poorly represented. For example, the rights

of Māori in the three natural resources examined have all been subject to Waitangi Tribunal claims and litigation in the courts. While the RMA provides for public participation in some processes and for assessments of environmental effects, follow-through and public accountability in resource consent information-related processes receive little independent oversight. The Fisheries Act showed weakly implemented environmental principles and a lack of provisions and processes for meaningful public participation in policy-making. Nor is the overall tenor of customary fishing regulations (particularly the North Island's regulations) representative of true Crown-Māori partnership and expression of rangātiratanga either in valuing customary Māori information in legislation and regulations or in providing formal pathways for its genuine uptake.

Under the RMA, s 35 as the core information provision sets the stage for the state's expectations about the public functions of property in natural resources and environmental management. Later by amendment s 35A information requirements attempted to reinforce existing RMA provisions for Māori in resource management and to bolster institutional support. These core provisions provided a base from which to explore and compare regional geothermal policy and rules and their application against the purpose of the Act. As the main field in which the research was carried out, geothermal resource management led the way to examine legislative and regulatory provisions for fisheries management and petroleum development within the natural resource bargain concept. The Fisheries Act and CMA provided no provisions equal to RMA s 35 and 35A to include multilateral interests in natural resource development. Under the RMA, it was perceived that the market would best determine how geothermal resources were allocated, with regional councils tasked to determine policy, rules and regulatory processes. Industry expertise became particularly influential in the development of regional policy and rules compared to other interest in geothermal resources. A similar story was seen in fisheries exploitation as the state increasingly withdrew from management roles. The CMAs amendments in 2013 (and subsequently) however mean petroleum developers face an increasingly activist department (particularly in relation to health and safety).

Under each regime, information provisions were devised to reflect the values associated with different ownership interests in each natural resource. Under the Fisheries Act, rights in fisheries were determined by (partial) historical catch effort which consolidated and strengthened private property-type holdings in fisheries resources to the exclusion of other fishing interests. The high value of petroleum minerals meant the state retained centralised control over the resource, with core functions to stabilise New Zealand's energy security and

to garner royalty returns. While this pattern of ownership and control of petroleum resources did not change with the wider privatisation of resources in the 1990s, the marginalisation of Māori interests in petroleum development continued after the passing of the CMA. Wider privatisation showed that despite so-called "balancing provisions" (sustainable utilisation under the Fisheries Act, and the CMA's Te Tiriti provision) and without legal information provisions applying to regulators and robust underlying structures to embed norms to balance economic interests that private interests (often well-funded and resourced with expertise) dominate.

The research explored the substance of information requirements and their respective functions in natural resource management. Through the information provisions examined the research showed that the rationales of neoliberalism and free-market environmentalism are unconvincing in the present day. Wider-reaching environmental provisions and Te Tiriti provisions must provide for multilateral interests in natural resource information requirements. The functional role of the bilaterally conceived natural resource bargain showed limitations in this respect.

The function and purpose of regulation as representing the state's view of how decentralised control and legislative purposes should be carried to manage natural resources were explored. Regulatory theory was applied to understand the institutional and regulatory processes supporting legal information requirements and processes with reference to Black's framework to assess the legitimacy of regulatory conversations. This approach provided practical insight into the involvement of private interests in policy- and rule-making and how policy definitions, rule interpretation and rule adjustment can be prone to skewing and/or slippage. Black's legitimacy criteria were used to examine compliance issues, access to regulatory conversations and public perceptions about the role of law in natural resource management. Discourse analysis showed how identity creation can affect both the substance of and processes associated with legal information requirements in natural resource management. Its analysis provided insight into the dynamics between different interpretive communities and how differing storylines impact creation and fulfilment of information provisions, highlighting their sometimes too narrow focus and disconnection to wider considerations. Overall, the thesis emphasised regulations' instrumental role in the creation and fulfilment of information requirements. Regulation analysis also showed how different types of regulation use and regulatory relationships can embed (and create) natural resource management norms to both good and ill effect.

While each regime revealed something unique in exploring the research questions, the similarities in information challenges identified between the regimes outweighed what was unique under each regime. Doremus provided the helpful analogy of sniffing out leaks in the pipeline by exploring the complex processes by which scientific and technical information is produced, expressed, transmitted and ultimately incorporated into decisions. With the help of a "nose" guided by natural resources law and by an understanding of regulation as an attempt to overcome the limitations of state capacity, "leaks" were found to spring for similar reasons at similar points within each regime's pipeline. While this approach was useful when examining each regime, this chapter summarises the overall effect of leaks on the resource management system and whether the various regime's "pipelines" successfully fuel the wider, national resource management "machine".

Notwithstanding Doremus' pipeline analogy, a visual analogy of cogs and gearing can perhaps be used more aptly to describe the mechanistic functionality of information provisions and processes within individual natural resource management regimes. Removing preoccupations of speed or torque, the analogy focuses rather on the movement-generating connectivity of processes or actions (cogs). The analogy may be usefully extended to consider other connective (dis)functions which could be described as incidents of intermittent connection between cogs, stickiness or complete disconnection. The causes of such incidents can be information process- and/or content-related or related to agency capacity or institutional culture. As seen, often a combination of these challenges exists simultaneously within regimes affecting optimal resource management. By focusing on information requirements through a natural resource lens, the thesis has demonstrated how information requirements and processes are functionally crucial to effective natural resource management in terms of long-term resource management decision-making, allocation decisions, the extent to which (and how) Māori rights and interests and the public interest are accounted for in natural resource decision-making.

The following table (Table 8.1) compares information provisions and processes under each natural resource regime. Thereafter, the following sections discuss themes identified in the table and explain why and how the research insights answer the research question which sought to identify ideal legal characteristics for information requirements to manage natural resources.

III Table 8.1 Information Provisions and Processes for Geothermal, Fisheries, and Petroleum Resource Management by Theme, Compared

THEME **THEME A** INFORMATION PROVISIONS	**RMA 1991**	**FISHERIES ACT 1996**	**CMA 1991**
Sustainability provision	Yes, s 5	Yes, s 8	No
Statutory 'information principles'			
Explicit	No	Yes, s 10	No
Implied	Information availability is an implied principle under the RMA, Apart from the limitation on public access to information, s 42		Arguably information principles are within the CMA purpose s 1A to promote prospecting, exploration and mining which align with NZPAM functions in s 5(e), below
Key statutory information provision	Yes	No	Yes
Explicit	Yes, s 35 duty to gather information, monitor, and keep records, and s 35A duty to keep records about iwi and hapū	No, s 276 provides for a National Fisheries Advisory Council whose functions can include making inquiries, conducting research, and making reports, but no such Council exists	Yes, s 5 (e) to collect and disclose information in connection with mineral resources and mineral production in order to — (i) promote informed investment decisions about mineral exploration and production; and (ii) improve the working of related markets
Implied		May be implied from s 8 ensuring sustainability, s 10 environmental principles and s 11 information principles	
Statutory Acknowledgements re Treaty Settlement (or customary rights interest) required in regulations or policy?	No, not legally required but future resource management policy documents should refer to statutory	Partial, customary regulations refer to fisheries Treaty Settlement; however related policy or rules could refer to existing	No, but future coastal and terrestrial planning documents beyond the CMA should refer to Māori rights and interests in petroleum

	acknowledgements and customary rights interests and regularly update them[3]	area management tools and, for example, to relevant customary rights recognition areas	resources in particular areas
Public Information availability	Yes, s 35 public access to environmental information is the RMA's default principle with the exception of s 42, protection of commercially or culturally sensitive information during proceedings	Not stated, s 121 protection of information during dispute resolution proceedings	Yes, ss 90-90G public access to resource information and data after five-year and fifteen-year holding periods
INFORMATION REQUIRED OF REGULATORS			
Information pertaining to Māori (*other than* consultation requirements about resource planning and development)	Yes, s 35A records about iwi and hapū	No	No
Environmental research	Yes, s 35	No	No
Environmental monitoring	Yes, s 35	Partial, IEMRS and non-mandatory Observers	No
Record keeping	Yes, ss 35 and 35A	Yes, ss 124, 127 and 128 (registers of quota holders and ACE)	Yes, ss 1A and 5(e), investment-related information collection and disclosure
INFORMATION REQUIRED OF RESOURCE USERS			
Natural resource law	Yes, reporting under resource consent/permit conditions about resource-use quantity, rate, geothermal system effects	Yes, permit-related reporting about quantity and location of catch, types of gear and fishing methods, under legislation and regulations	Yes, permit-related reporting requirements, resource-use quantity, rate and quality, under legislation and regulations

[3] See for example, recommendations in *New Directions* (2020), above n 1 at 105, 265 and 276.

Environmental law	Yes, assessment of environmental effects, resource consent conditions reporting, and management plan adjustment reporting	Partial, permit-related reporting requirements about quantity (to maintain sustainable fish stocks), type (discards) and environmental effects of bycatch (mammals and birds) but an environmental effects assessment is not a statutory requirement	No, indirectly under RMA 1991 and EEZ legislation
Iwi and hapū engagement, assessment of cultural values	Engagement may/may not be a requirement of resource consent application process; Nb. AEE includes cultural matters, sch 4 cls 2(1)(f), 6(h), and 7(a) and (d)	No	Yes, s 33C iwi engagement reports
THEME B INFORMATION PROCESSES, STANDARDS AND AUDITING	**RMA 1991**	**FISHERIES ACT 1996**	**CMA 1991**
Non-statutory management tools for information and data challenges	Yes, adaptive management, system management plans, peer review panels and technical modelling	Yes, Harvest Strategy Standard (2008), Science Information and Research Standard (2011), and Iwi Fisheries Forums	Digital Data Submission Standards (2016)
Verification/audit of information and data supplied by resource users under permit or resource consent	No, peer review does not extend to *verification* or *audit* of geothermal resource consent applications or of on-going consent holder data and information reporting	No, not without IEMRS, and/or Observer coverage of fishing practices and record-keeping	Yes, independent auditing is inbuilt, ss 99A-99G
***Legal* standards for research, the application of science and technical information and in technical modelling for resource management and compliance purposes**	No	No, although the Harvest Strategy Standard (2008) is now considered part of best available information, s 10	Yes, ss 2(1) good industry practice, s 105C and NZX Listing Rules
	No	No	Yes

Public register for technical expert associations, including conflicts of interest			

THEME C/D RULE DEVELOPMENT, SELF-REGULATION AND REGULATORY CONVERSATIONS	**RMA 1991**	**FISHERIES ACT 1996**	**CMA 1991**
Resource-user involvement in policy and rule development provided under the Act	Yes	Partial	No
Public involvement in policy and rule development provided under the Act	Yes, formal public participation processes for policy and plan development	Very limited, no statutory public participation processes (no appeal of decisions except through the courts)	No
Public access to officially held resource and environmental information under permits/resource consents	Limited, geothermal resource management policy about publicly available information and data varies regionally	Potentially, limited interpretation of LGOIMA 1987	Yes, information/data holding periods apply for 5 years and 15 years after which information and data are publicly available
Resource-user self-regulation	Yes, the accuracy of information and data provided under a resource consent is provided to regional councils as a matter of trust. Extensive resource-user involvement in rule (and technical model) development is also considered self-regulatory	Yes, Part 15A, CSOs (Unless IEMRS or an observer is present there is no way to check the accuracy of permit-reported information) Extensive resource-user involvement in science research procument may also be considered self-regulatory	No
Regulatory conversations	Yes, extensive with consent application process, PRPs and ongoing compliance monitoring	Yes, VADE compliance model	No

THEME E REVIEW, EXTERNAL OVERSIGHT, LINKS WITH META-GOALS	**RMA 1991**	**FISHERIES ACT 1996**	**CMA 1991**
Policy and/or rule evaluation	ss 32 and 58T	No	No
Third-party oversight of information and data processes (external to the main regulator or resource user)	No, s 32 reports are self-evaluative[4]	Limited, external peer review sometimes under fisheries Science Working Group processes	Yes, ss 99E-99F Securities law rules can also be considered external oversight
Centralised, coordinated database for resource-user-supplied information and data and regulator research information and data and/or research commissioned by the regulator or resource user	No	No[5]	Yes
Statutory information requirements connected to meta-environmental or natural resource management goals requiring routine information and data reporting by regulatory agency	No	No	No

[4] See s 32 criticisms and recommendations in *New Directions* (2020), above n 1, at 277, 255 and 374.

[5] See further in *Future of Commercial Fishing* (2021), above n 1, at 23, 82 and 265.

IV Insights and Recommendations

The comparison table provides an overview of the legislation researched in the thesis and serves to revise the central issues discussed in the previous chapters. Themes A–E drawn from the table group insights to answer the research question. Themes are:[6]

- A information provisions in natural resources law (ie those relating to norms and functions);
- B information processes (ie tools related to functions);
- C resource users and rule development (ie function linked to legislative structures/norms);
- D regulatory conversations and self-regulation (ie function and tool linked to legislative structures/norms); and
- E external oversight and links with meta-goals (ie relating to norms and structures).

The comparison of legislative information provisions and processes within the table emphasised the role and functions of information provisions and the gaps in their application and connectedness to broader environmental, resource management and Indigenous rights goals. As these comparisons reveal, resource management information and data reporting and compliance monitoring systems struggle to fulfil overarching legislative purposes. Further, in some instances statutory information provisions themselves are too narrowly focused and/or are poorly connected to wider resource management goals and environmental threats; thus, they stymie institutional effectiveness and information processes at the highest level. Non-statutory and informal information management processes are common especially for geothermal and fisheries resource management.

In the decades since the privatisation era and presently where New Zealand's premier environmental and natural resource legislation (the RMA) is currently being replaced, ample evidence shows that legislative information provisions and information systems in natural resources legislation have served Aotearoa New Zealand poorly.[7] Now is the time to reflect on

[6] The present research acknowledges the Environmental Defence Society's helpful categorisation of issues using "norms, functions, structures and tools" in Greg Severinsen and Raewyn Peart *Reform of the Resource management System: The Next Generation* (Environmental Defence Society, Auckland, 2018); and (similar) in Greg Severinsen, Raewyn Peart and Bella Rollinson *The Breaking Wave: A Conversation about Reforming the Oceans Management System in Aotearoa New Zealand* (*Breaking Wave*) (Environmental Defence Society, Auckland, 2021).

[7] See *New Directions* (2020), above n 1; *Focusing Aotearoa* (2019), above n 1; Office of the Prime Minister's Chief Science Advisor *The Future of Commercial Fishing in Aotearoa New Zealand: Key Messages (*February

the insights learned over the last three decades and to grasp an opportunity to craft more effective information provisions for the future which reflect both a broader range of interests in natural resource management and which are more interconnected and long-term focused.

The following sections discuss insights from the research at theme level and offer recommendations in answer to the research question.

A Information Provisions

The research explored the functions of legal provisions for information in natural resources management. It noted the different types of information requirements ie those for regulators and for resource users. Of the core information provisions examined under each regime ie those that direct the relevant regulatory agency towards particular information-related actions, RMA ss 35 and 35A most comprehensively articulate norms that provide for multilateral interests in natural resource management. The s 35 duty to gather information, monitor and keep records requires multiple information-related actions by regional authorities. These actions are of a type that have crucial flow-on effects with other regional authority functions under the Act, including monitoring regional policy and plans, the exercise of delegated duties and the exercise of resource consents. In this way, s 35 is functionally a central cog off which other actions (cogs) generate their momentum and drive. Section 35 is "driven" by the Act's sustainable management purpose—s 5. However, as seen, stickiness and/or disconnection can occur within seemingly interconnected provisions and processes within a single management regime.

Core statutory information provisions were various and not always explicitly linked to the purpose of each Act or to wider management goals. For example, the information principles of the fisheries regime provide no guidance about information quality or type or how information to inform sustainable fisheries management decisions should be sought. The Fisheries Act has no core information provisions requiring actions by the regulator equal to RMA s 35. As noted in chapter six, there is no link in the Act between the goal to maximise the value New Zealanders obtain through the utilisation of fisheries resources and protection of the aquatic environment and all the outputs and activities undertaken by the Ministry. Conversely, RMA s 35 and for example information provisions for the content of regional policy statements and

2021); Greg Severinsen *Reform of the Resource Management System: A Model for the Future* (Synthesis Report) (Environmental Defence Society, Auckland, 2019); and Marie A Brown, Raewyn Peart and Madeleine Wright *Evaluating the Environmental Outcomes of the RMA* (Environmental Defence Society, Auckland, 2016).

plans provide machinery (cogs) to implement the purpose of the Act. Information principles under the Fisheries Act are not directive toward taking action of any kind in respect of acquiring information and data. Rather, the principles concern how decision-makers should decide things. Similarly, the Fisheries Act's environmental principles (which could also provide momentum directive of information and research) are only required to be "taken into account". In effect, they largely freewheel under the Act.

On the other hand, although the core RMA and CMA information provisions are not explicitly principles-based, information principles can be inferred from them. Public-oriented duties within RMA s 35 include proactive information gathering and research by regional authorities, including resource consent monitoring, resource consent recordkeeping and public access to information. Similarly, the Te Tiriti principle of Crown-Māori partnership and therefore Māori participation in resource management decision-making and power sharing may be inferred from RMA s 35A. Apart from the information provisions for ongoing permit-holder engagement and reports concerning Māori participation in petroleum development, the CMA's information provisions are solely centred on the promotion of resource development and the efficient functioning of financial markets and on energy security/planning. The regulator information provisions under the CMA are explicit—particularly the functions of the Minster to collect and disclose information in connection with mineral resources and production to promote investment in development and thus the Act's purpose. This legal duty clearly flows into the Act's other information provisions such as provisions for limiting protection of commercially sensitive information and the detailed permit-holder reporting requirements with legal standards for reporting.

Resource-user information requirements—those forming the terms of the natural resource bargain—tended to reflect the economic interests of the resource owner and resource user. The natural resource bargain was identified as a central concept in natural resource law which as a concept arose before the advent of environmental and Indigenous rights law as they are known today. These provisions functioned to allow the owner (often the state) to manage resource exploitation in the short term and to control the resource in the long term. These basic functions of information requirements in natural resources law remain unchanged today. However, in examining information requirements and information management processes, theories of regulation and compliance challenges, the research finds that the natural resource bargain's promotion of typically bilateral interests may require fundamental rethinking.

For example, even under the RMA the Waikato Regional Policy's focus on efficient rather than sustainable use of geothermal development systems suggests this need. While economic factors remain highly relevant to resource use and development, their dominance and influence can overwhelm other considerations especially where neoliberal environmentalism influences institutions and regulatory practices. For example, no auditing of the information and data provided in compliance with geothermal resource consents (in terms of real-time review of information and data or through running alternative technical models) is undertaken. Moreover, before policy required it, resources users themselves would select peer review panellists to review their compliance. Although for geothermal resource consent applications most assessments of environmental effects will be subject to external review, resource users themselves have extensive input into shaping and negotiating the information requirements forming part of such assessments. Referring to the cog analogy, a point of "disconnect" with s 35 and resource consent compliance monitoring may be found concerning a regional council's limitations around carrying out geothermal (state of the environment) research and a consent holder's capacity to generate environmental information and data which could feed into such research, planning and monitoring. Where consent holders assert proprietary rights over consent generated information and data regional authorities (and peer review panels) are limited in what use can be made of such information due to how regional authorities interpret official information law.

For commercial fishing operations, there are no similar assessments of environmental effects and few resource use conditions are routinely enforced; commercial fisheries information reporting has never been subject to systematic auditing. Even in minerals development within a statutory regime with no environmental effects requirements and with purely economically driven information requirements, the requirements themselves were found to lag behind international best practice in a number of areas prior to the CMA 2013 amendments, thus showing that disconnect with statutory goals or underlying management norms can occur in both environmental and economically driven spheres.

Information provisions pertaining to Māori within the legislation examined generally provided Māori with a subsidiary role in resource management either as amendments to the Acts (RMA, s 35A in 2005, and CMA s 33C in 2013), or in the case of Fisheries Settlement legislation and regulations, customary information provisions are cast within artificially separated fishing rights and (in the case of the North Island) historical, unilateral regulation-making by the Minister. Resource management reform Review Panel recommendations accept that the current

resource management system has failed to deliver on opportunities provided under the RMA for Māori [8] This research suggests the same may be said for fisheries management where the Fisheries Act lacks formal pathways for the integration of customary Māori information and explicit links with information acquisition under customary regulations.

The lack of robust identification process within RMA s 35A is not necessarily only a matter of statutory drafting. As identified in chapter three, information requirements that are not linked to wider and enforceable statutory objectives are at risk of poor (or no) implementation. To this end, the Review Panel identified many areas where information provisions for Māori under the RMA could be better linked. Primarily, the Panel recommended an oversight body to monitor Te Tiriti performance from a Māori perspective via a National Māori Advisory Board.[9] A duty of the Board would expand the records currently kept and administered through Te Puni Kokiri under s 35A. The current government's agenda to reform New Zealand's oceans management system, including commercial fisheries management, should extend to improved information pathways for mātauranga Māori and greater expression of rangātiratanga for customary fisheries management for Māori. The recent, wider use of voluntary rāhui, the development of the Ohu Moana pilot projects and *Sustainable Seas* research demonstrate how binary conceptions of the power of regulator and regulated has been a mismatch in the Crown's approach to customary fisheries management.

The research reviewed iwi engagement reports which became mandatory by CMA amendment in 2013. However, due to the discretionary nature of NZPAM's decision-making regarding area exclusions by tangata whenua, iwi engagement reports may have little real meaning for some Māori, whether or not these are formally required by the Act.

Overall, if regulator information requirements in statute are weak, vague, poorly linked or non-existent, pathways for the uptake of mātauranga Māori and the meaningful expression of rangātiratanga and kaitiakitanga are compromised. Further, poor regulator information requirements mean resource-user information requirements will be harder to create, monitor and enforce. Information principles must be reinforced by provisions for information acquisition and formalised research-related actions and pathways for the uptake of different types of knowledge. While some statutes may retain a greater exploitative norm (such as the

[8] See *New Directions* (2020), above n 1, chapter 3.

[9] At 110.

CMA), reconsideration about *how* and *under what terms* resources are allocated in future will become necessary.[10]

Ideal legal characteristics for a statute's core information provisions—including information provisions affecting and providing for Māori—and provisions requiring information from resource developers include clarity of function and roles within information provisions, adequate scope for multilateral interests and functional connectivity to both a governing statute's purpose and to higher-order purposes external to the governing legislation.

B Information Processes

The information management processes under each regime and the information management tools used within them evolved independently of specific statutory direction. For example, regarding adaptive management and how it works in practice, the RMA does not stipulate whether a resource consent applicant's assessment of environmental effects should be reviewed by a third party; how peer review panels operate in compliance monitoring; or how technical modelling is used in gauging compliance; furthermore, the Fisheries Act does not stipulate how fisheries research is organised and conducted and how customary Māori information is sought and applied.

Adaptive management as an expression of the precautionary approach is not referred to in the RMA, yet adaptive management is built into geothermal resource management policy. While not commonly described as an information management tool, adaptive management has considerable bearing on information processes and on the formulation of information (and data) requirements. Indeed, the precautionary approach was created to account for limited information in natural resource decision-making and to allow for staged resource development and the ongoing assessment of environmental risks to gauge whether development should continue. Adaptive management is reliant on the accurate and timely supply of information and data from resource users and on its review. Case law has clarified the components and needs of adaptive management and has recognised the role of peer review in resource management under the RMA but has not expounded on it. No formal peer review standards have been developed for natural resource management or resource-user compliance by the courts or by regulators. While peer review panels are mandatory in managing large-scale geothermal resource use under resource consents under regional policy and policy lists the technical (and

[10] See Crown Minerals (Petroleum) Amendment Act 2018 (2018 No 49); *New Directions* (2020), above n 1, at 17-18 and chapter 11; and *Breaking Wave* (2021), above n 6, at 94-95.

cultural) skills needed in panellists, the panel's peer review *process* is not stipulated or formalised in policy or rules.

Technical modelling is also routinely used to manage resource use and resource-user compliance. Nevertheless, as noted in chapter four no legally enforceable best practice standards are used nationally. The failure by the Overseer model as a regulatory tool resulted from having no legally enforceable best-practice standards and no legal requirement for third-party oversight for regulatory modelling tools. The research explored whether geothermal resource modelling as a regulatory tool can truly be considered "adaptive management" where overarching regional policy does not require sustainable use of development geothermal systems (Waikato region) and suggested "flexible management" as more suitable nomenclature where policy does not explicitly require adaptive management (so-called) to be linked to precaution. The research also explored how geothermal peer review does not include a true audit or verification of resource-user compliance because real-time data is not checked and because alternative technical modelling is not run (in addition to the resource users' modelling). It may be that, because Waikato Regional Policy does not require sustainable use of development geothermal systems formal standards for modelling and independent oversight (true auditing) are deemed unnecessary, general review of efficient use seems to be the peer review panel's mandate. No legal rules about subsequent uses of development geothermal systems apply and information and data from resource consents are not required to feed for example into national level energy planning. Moreover, future generations' energy needs are only vaguely alluded to in policy and planning instruments.

Under the CMA and regulations, information management processes in petroleum resource reporting using internationally standardised codes and the application of securities law was not legally mandatory until 2013. In contrast, there are no legal standards around geothermal resource reporting that require a Competent Person to report under securities law rules for publicly listed geothermal development companies. Geothermal resource development requires public equity finance and seeks this in the region of hundreds of millions of dollars; nor is geothermal resource development risk-free. Therefore, as internationally recognised standards are soon to become available, legal standards for geothermal resource Competent Person resource reporting should apply.

The High Court only recently formally recognised the commercial fisheries management *Harvest Strategy Standard* as a component of "best available information" under the Fisheries

Act.[11] Like the *Harvest Strategy*, the fisheries management *Research and Science Information Standard* however remains non-binding until formalised or declared legally binding by the courts. This lacuna is concerning given the contestation of fisheries information by commercial fisheries users and the significant gaps in data and knowledge within fisheries management. Fisheries NZ Science Working Groups are also an informal information management process which struggles to maintain impartiality and to incorporate a plurality of views, including the incorporation of mātauranga Māori alongside science information. More support is needed (by government and within legal frameworks) to incorporate non-commercial management perspectives. The research acknowledges that formalised (legal) standards for research, peer review and technical modelling are not a cure-all; nonetheless, legal enforceability goes a long way in holding both an agency and a resource user to account and in strengthening the public's (and less well-represented stakeholders') perception of fisheries management.

The research also reviewed how FNZ sources customary Māori information as part of the Fisheries Act definition of "information". The Act and regulations provided no explicit pathway for the sourcing of customary information by the Ministry nor any nuanced explanation of what customary Māori information means or how it is important not only to Māori but to fisheries management and the health of the aquatic environment as a whole. An informal information management process to glean customary Māori information developed by the Ministry may be seen within Iwi Fisheries Forums (eight exist nationally); however, these forums are generally focused on TAC setting decision-making rather than on the incorporation of local knowledge at hapū level regarding the environmental effects of fishing. Fisheries NZ may struggle to incorporate customary Māori information where the Fisheries Act provides no explicit direction for its uptake. Future fisheries management policy and rules should be co-designed with Māori. They should provide explicit reference to the value and incorporation of matuaranga Māori customary information and formal pathways for its delivery and uptake.

The legislative regimes examined by the research were all flexible in allowing for the evolution of informal information management processes and tools and for their incorporation in natural resource management decision-making, including in resource planning, allocation and resource-user compliance. While this flexibility can be viewed as a "plus", their informality evidences concerning gaps. Overarching national-level standards for information processes

[11] *Royal Forest and Bird Protection Society Inc v Minister of Fisheries* [2021] NZHC 1427.

should apply for data management, technical modelling and the use of peer review in regulatory settings. From there, individual statutory regimes can be more prescriptive in tailoring information provisions and formal information management processes that are independently reviewed against national-level criteria.

C Resource Users and Rule Development

The thesis showed that resource-user input in policy and rule-making has considerable impact on the formulation of information requirements and processes in natural resource management and that without meaningful wider participatory processes and clear articulation of values legal provisions for information and information processes will defer to the input of those who are financially and technically best equipped to participate in their creation. As the research contended in chapter five, public concerns about bilateral rule-making (for example, by a resource user industry and regulator) are fundamentally linked to legitimacy concerns and expectations which surround the rule (and role) of law. While narrowly focused information provisions might be expedient from an economic perspective, the role of natural resources law must be more ambitious and encompass wider interests. Law must also be ambitious in its incorporation of mātauranga Māori and tikanga Māori as the first law of Aotearoa New Zealand.

Input in policy and rule development by geothermal resource consent holders exceeded that of the resource users of commercial fisheries or petroleum resource regimes because the RMA provides formal processes for public input (and appeals) in regional policy and plan development. As chapter five showed, public participation largely comprised input by private interests, including resource consent holder companies and industry associations and companies associated with geothermal resource development. Technical specialisation associated with geothermal resource development provides input distinctly different to public and other interests. The industry sector has both the most to gain financially from geothermal resource development and is best equipped financially to participate in policy- and rule-making processes, including the appeal of decisions.

For example, chapter four explained the implications of a regional council's decisions: 1) to remove information within a proposed regional policy document's geothermal chapter on emissions caused by geothermal development because an industry submitter wanted it put under the air quality chapter and 2) to remove descriptive information in policy documents which would explain to a layperson how geothermal resource depletion occurs and its implications on a geothermal system. Such decisions erode the accessibility of information and

public understanding of geothermal resource management issues and therefore compromise the public's ability to participate in policy- and rule-making. While such policy omissions may seem minor, by adding considerable strength to private interests' input they shape who has access to rule-making, what issues are in scope and what is publicly understood about geothermal resource development. Such policy decisions also chip away at and impact specific information provisions themselves. For example, although geothermal resource depletion is not considered an adverse environmental effect in development geothermal system use or management, there are no legal information requirements for resource users to report regularly on the future, projected state of the geothermal system at the end of the resource consent period. It is expected that the geothermal energy (heat and pressure) in the system will gradually deplete until it no longer becomes economic for the resource user to extract from the system. This presumption in turn leaves the consideration of "future generations" in limbo, with no substantive acknowledgement or consideration of what their needs might be or in what state the resource should be passed down.

Petroleum resource developers have no formal input into policy- and rule-making in a routine way. Rather, the NZPAM applies the law and formal standards for petroleum development that have developed internationally in a unilaterally decided fashion. Given Māori Te Tiriti interests in petroleum resources, and questions about whether the environment itself should have constitutional-level protection, it is arguable that unilateral decision-making by Cabinet about petroleum development is a flawed approach.

Input by the commercial fisheries industry in policy- and rule-making has similarities with that of the geothermal development industry. However, the Fisheries Act does not contain formal participation and review processes for policy and rule development as under the RMA. As rights holders in perpetuity regarding their ownership of ITQ, commercial fisheries' input is underpinned by a resounding "user pays, user says" ethos which fosters the commercial fishing industry's perception of its place as the pre-eminent stakeholder in fisheries management. Although policy consultation documents appeal to "all New Zealanders to have a say", in reality the policy focuses primarily on fish stocks and thus the rights of ITQ holders. As holders of substantial rights in commercial fisheries as a result of the Fisheries Settlement, Māori ITQ holders receive particular considerations via consultation requirements. However, the input by Te Ohu Kai Moana on behalf of Māori ITQ holders is concerned with maintaining the economic value of quota holdings similar to that of non-Māori ITQ holders.

Numerous recreational fishers are not formally represented by a unified body or organisation which arguably limits their input in policy and rule-making. Further, although the Minister will take recreational fisher input into account in setting TAC, the extent to which the Minister does so is discretionary.

The research also examined customary fishing regulation- (and therein, rule-) making for the establishment of customary area management tools and regarding the creation of customary fishing information provisions in regulation. Noting dissonance in customary fishing information requirements with genuine power-sharing and provision of rangātiratanga, the research examined the customary regulation- (and therein, rule-) making process between North Island Māori and the Ministry as a result of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. The "resource user" input into policy- and rule-making in this context was procedurally compromised in crucial respects, particularly in the Crown's failure of good faith negotiations. The research applied Black's theory of regulation and argued that "disaggregating" the regulatory process by examining the initial development of the customary (North Island) regulations might offer better understanding of both the efficacy and subsequent uptake of the customary fishing regulation's information provisions. The thesis suggested that discourse analysis as a disaggregating tool can rehabilitate the role of knowledge and ideas in regulation and suggested that understanding the identity-creation (whether passive or active) of the principal participants in natural resources law is key to expressing optimal legal characteristics for information requirements in the management of natural resources.

Tangata whenua proposals to Fisheries NZ regarding the formulation of regulations and bylaws for localised application under area management tools provide a site for customary fisheries users to have an input into rule-making, with flow-on effects for information provisions. As commentators have observed however, at all steps of the application and input process leading to the establishment of localised regulations or bylaws the appointments of tangata kaitiaki and establishment of rules are at the Minister's discretion. A legal system that does not genuinely provide for rule co-creation with Māori and which is reliant on Ministerial discretion for their approval perpetuates a limited "right to culture" model rather than allows for the expression of rangātiratanga. However, wider use of voluntary rāhui in densely populated coastal areas and the Ahu Moana pilot projects disrupt the status quo.

Promisingly also, many examples of the rehabilitation of knowledge and positive identity recreation (or affirmation) may be seen in the language of current resource management reform

where *Te Mana o te Wai* is a core principle within freshwater management reform[12]; *Hutia Te Rito* is the core concept underpinning the proposed National Policy Statement for Indigenous Biodiversity;[13] and *Te Oranga o te Taiao* contains the central values underpinning the draft Natural and Built Environments Bill.[14] Based on Māori identity and worldview, these principles expressed in te reo Māori are explicit and intentional. Western law as the second law of Aotearoa is however rehabilitated through providing a place in law for tikanga, the first law of Aotearoa New Zealand.[15] This inclusive approach is intended to be permanent and transformative.[16] An optimal legal characteristic will be law's ability to reflect a plurality of interests in natural resource information requirements. Critical examination of the natural resource bargain's typically bilateral development of policy and rules and of historically acceptable economic-focused decision-making is required. Māori knowledge and Indigenous applications of regulation are provided for by understanding the cultural bias of Aotearoa's second (Western) law, and by providing space to contest its assumptions.

D Regulatory Conversations and Self-regulation

As identified in chapter two, modern regulatory practice requires a deep and nuanced institutional analysis of the motivations, interactions and institutional environments of the regulatory actors in regulatory regimes. Regulatory conversations (closely associated with theme C) were situated within Black's legal theory of regulation which recognised the rise of decentred understandings of regulation where regulatee involvement in rule-making and where co-regulation and self-regulation commonly occur. Specific insights from analysis of regulatory conversations were drawn from each regime.

Regulatory conversations in geothermal resource management were examined in the context of the relationship between regional council, peer review panel and resource consent holder. Regulatory conversations occurred at various points: in the development of policy and rules;

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[12] *Te Mana o Te Wai* is found within Ministry for the Environment *National Policy Statement for Essential Freshwater* (2020) at [1.3]; see further Department of Internal Affairs *Transforming the System for Delivering Three Waters Services: The Case for Change and Summary of Proposals* (June 2021).

[13] Ministry for the Environment *Draft National Policy Statement for Indigenous Biodiversity* (2019) at [1.7(1)].

[14] Ministry for the Environment *Natural and Built Environments Exposure Draft* at cl 5(1) and (3), see <www.environment.govt.nz/assets/publications/Natural-and-Built-Environments-Bill-Exposure-Draft.pdf>.

[15] See Robert Joseph "Re-Creating Legal Space for the First Law of Aotearoa-New Zealand" (2009) 17 Wai L R 74 at 96; and Justice Joseph Williams "Lex Aotearoa: An Heroic Attempt to Map the Māori Dimension in Modern New Zealand Law" (Harkness Henry Lecture) (2013) 21 Wai L R 1.

[16] Williams (2013), above, at 12.

in drafting resource consent applications and formulating resource consent conditions; and in on-going compliance monitoring. Noting that the legitimacy of the conversational process is primarily contingent on who has the authority to determine the interpretation and application of rules, the thesis noted that difficulties arise where authority is blurred. The research explored this idea in relation to the peer review panel whose role functions as the technical reviewer of a resource consent application and of resource consent compliance on a regional council's behalf. The *Efficacy Review* found that a lack of clarity existed regarding the peer review panel role (including for panellists themselves) and a reluctance on the part of panellists to press consent holders for certain information and data for fear of alienating them. These insights helped in understanding the commitment of the participants and distributions of power and authority. Access to regulatory conversations was found to be limited by certain factors such as resource consent holders' commercial sensitivity claims over information and data, uncertainty on the part of regulators in protecting such claims and policy's failing to adequately describe resource management issues and challenges for laypersons.

Trust and accountability—two essential elements for the conduct and accountability of regulatory conversations—are primarily developed by regulators establishing a reputation for fair and consistent treatment and of resistance to agency capture. Focus on trust emphasises the need for regulation to be responsive not just to wider interests in its formation and to the regulated in its operation but to the claims of society as a whole in the integrity of its function. In this respect, regional councils could routinely make compliance monitoring issues and outcomes publicly available; the peer review *process* could be formalised in rules; and policy and plan discrepancies between regions could be removed. Furthermore, having clarity of explanation of resource management issues and strategic national-level accountability for geothermal resource management with a centralised information and data platform would raise the profile and accountability of regional councils, geothermal resource management and resource users. Legal information requirements and information processes in geothermal resource management would also benefit from oversight by an independent agency (discussed below). Improved visibility of resource management issues, legal processes and standards (for data, peer review and technical modelling) and more public availability of information and data (including the potential public ownership of technical models) are all justified.

Fisheries regulatory relationships and conversations primarily concerned compliance. Permit holder reporting as a form of self-regulation has historically failed and an endemic lack of trust surrounds commercial fisheries regulatory compliance. This situation has in turn created

mistrust between commercial and recreational fishers and between FNZ, regulated parties and the public at large. Fisheries NZ's light-handed compliance approach mixed with industry self-regulation has failed to account for the growing risks with commercial fisheries' misreporting. The Act's lack of a public participation process also confines "access to the conversation". Access to regulatory conversations for Māori (especially at hāpu level), environmental and recreational interests are not well provided for under the Fisheries Act due to a lack of formal processes and the Act's narrow focus on the sustainability of fish stocks. Although the Minister must consult with interested parties, provisions for the type of consultation are not prescriptive and thus do not genuinely encourage a regulatory conversation. Even the mandatory requirement for the Minister to consult with tangata whenua who do not have commercial interest in fisheries management is not prescribed.

Clearly, regulations purporting to provide for Māori rights in fisheries must be negotiated in a way that accounts for power asymmetry, whether in resourcing or in equal recognition of the Māori worldview and values. In a search for optimal legal characteristics for natural resource law information requirements, discourse analysis as part of the analysis of regulation and regulatory conversations showed that one must explore and engage with identities and values as regards what identities, values and needs are being provided for and for what purposes. While these may appear to be non-legal questions, the answers to such questions are eventually embodied in law, regulations and information requirements. The long-term success of natural resource and environmental management regimes will hinge on getting the answers to such questions right and on providing processes and fora for the inclusion of multiple interests. Exclusion can be a short road to mistrust, dissatisfaction and contestation, a destination which provides slim hope for the "communicative miracles" needed to unravel current fisheries management impasses. Arguably, the geothermal resource is a less well-understood and less-accessed resource nationally compared to fisheries resources; nevertheless, the same questions should be asked in devising future information requirements to manage the resource.

Although less analysis was given to regulatory conversations relating to information requirements under the CMA than those in geothermal and fisheries management, the research nonetheless reaffirmed that the broader statutory regime within which information requirements sit affects information requirement efficacy. For example, NZPAM's statutory discretion to unilaterally disregard area exclusion zones put forward by tangata whenua undermined iwi engagement reporting requirements. Analysis is a tool for disaggregating the regulatory process and identifying at which points regulatory conversations occur, between

whom and about what. This research suggests that, where there is no extensive intersubjective sharing of ideas and true negotiations of meaning, conversations which reach beyond disputation of facts, the formal application of law or priorities of rights must be had between all stakeholders as a way to resolve resource management impasses.

E External Oversight and Links with Meta-goals

The research showed that external oversight of information requirement and information processes for the management of resources was compromised, particularly within the geothermal and fisheries management regimes. Although a non-renewable resource, many petroleum resource management information requirements and processes were exemplary in comparison due to: the independence of compliance auditing of permit holder supplied information and data provided to NZPAM; formal standards for data and legal requirements for formal resource reporting in adherence to internationally standardised codes, including Competent Person requirements; securities law requirements embedded within the petroleum management regime; and the public availability of information and data after specified time periods. Collectively, these features provide considerable external oversight of information provisions and information processes in the management of the resource. Further, the centralised management of resource-user information and data by NZPAM improves resource management decision-making for resource allocation, infrastructure and energy planning, regional development and revenue accounting. Information and data about the resource's development are required, reported, independently audited and stored for multiple and diverse reasons. Due to the resource's economic value and the high environmental and financial risks involved in its development, the internationally standardised nature of petroleum resource development and its supporting law have manifested in petroleum resource management information requirements that are more easily reviewable by law, thus making it more easily accountable to third parties particularly to the state as owner and to the public in terms of investment and environmental risk management. While the 2013 amendments increased Māori representation, no formal oversight body currently exists to monitor the adequacy of these changes.

In contrast, the RMA's premier information provision s 35 is silent on how or if regional authority information gathering, environmental research and monitoring should be linked to resource management goals beyond the RMA. Where s 32 reporting is required to evaluate the effectiveness and efficiency of policy and plans, s 32 is largely a self-evaluative, internal

exercise. While the RMA's general, underpinning norm of public access to environmental information is clearly expressed in s 35 and thus provides potential for external oversight of decision-making, the functional links between ss 32 and 35 can be missed. Whether as information provisions for a geothermal resource consent applicant's assessment of environmental effects or as related requirements within regional policy and rules within the operation of a consent, the research showed that external oversight of information provisions for geothermal resource exploitation is effectively limited to compliance review by peer review panels. As shown, the policy and plan development cycle is largely a negotiation process between regional authorities and the geothermal industry so that (either or both) resulting information requirements or information management processes may be compromised by a general lack of public awareness and engagement and by a lack of central government guidance and oversight. The RMA's permissible overall broad judgment approach in decision-making has also compromised incisive, independent oversight. The RMA's resource allocation and high-trust compliance models blur the distinctions between resource owner and resource user information needs. In contrast, the CMA's resource tendering, royalty provisions and lack of process flexibility bring resource owner information needs into sharp relief.

While the courts have affirmed the criteria which must be present within adaptive management, formal process requirements have not been developed either for the use of peer review or of technical modelling. The regulatory failure in the Overseer model recently showed that New Zealand's resource management system must require more of regulators and resource users by formalising legally reviewable standards and independent oversight mechanisms. Public ownership of technical models used extensively in resource-user compliance may also be advisable, especially where users of public resources claim commercial sensitivity of information and data may no longer be equitably justified.

Iceland showed that the geothermal resource regulator's legal responsibilities to inform strategic energy planning, the upkeep of centralised data and information and responsibility for the carrying out of (delegated) research had flow-on effects into permit-holder information requirements and monitoring. Fines were also imposable for non-supply of required information and data. It is arguable that this measure and the legal obligations of the regulator would also impact the regulatory relationship and the perceived strength of consent holder "wriggle room". Iceland's stronger regulator information requirements also enhance public perception of geothermal resource management there. In contrast, New Zealand's inconsistency of approach in regional policy and rules and lack of centralised reporting or data-

management play into commercially driven agendas and hamper public understanding of geothermal resource management issues. Icelandic resource consent holders cannot assume a right of renewal at the end of their consent; nor is the resource allocated on a first-in first-served basis. New Zealand can learn from Iceland and current resource management reform proposals for National Strategic Planning and system efficiencies show promise through for example centralised digital tools and national data sets, standardised methods and models.[17]

Presently, central government funds current research to explore the use of the supercritical geothermal resource and—particularly since the establishment of the Climate Change Commission—greater interest is generated by central government in the long-term benefits and capacities of geothermal resources. However, multiple risks are associated with the development of supercritical geothermal resources. The public must not be (either inadvertently or otherwise) excluded from important discussions about how the development of supercritical geothermal resources might occur. The government's majority shareholding in New Zealand's largest geothermal development company within a competitive geothermal industry and its joint-venture arrangements with Māori in geothermal development companies are arguably at odds with the arm's length consideration that such issues require.

Recently affirmed government policy to install *IERMS* on inshore commercial fishing vessels goes some way in addressing external oversight of information issues in fisheries management.[18] However, in comparison the invisibility of customary fisheries information requirement and information process challenges are given less attention nationally. The resource management reform Review Panel's recommendation for a National Māori Advisory Board to monitor Te Tiriti performance from a Māori perspective [19] is overdue and will provide oversight at a level which is likely to be directive in formulating information requirements and formal information processes deserving of tangata whenua as Te Tiriti partners for fisheries management and the management of other natural resources. The Review Panel also made significant and comprehensive recommendations to strengthen, align and link environmental monitoring and reporting requirements for resource management at structural and institutional levels. Increasing the oversight roles of the Ministry for the Environment and Parliamentary Commissioner for the Environment have potentially far-reaching implications for information

[17] Ministry for the Environment *Natural and Build Environments Bill: Parliamentary Paper on the Exposure Draft* (undated) at appendix 2.

[18] Cabinet Paper "On-Board Cameras Across the Inshore Fishing Fleet" (2 July 2021).

[19] *New Directions* (2020), above n 1, at 110-111.

requirements and processes.[20] The application of official information law in providing public access to natural resource information in the context of private exploitation of public resources could be clarified and strengthened at national level.[21]

Returning to the cog analogy, stickiness in rotation or the connection of a cog can also occur if separate legal regimes to manage resources do not cohere both with each other and with national-level information management goals. Information provisions in natural resources law must be strongly connected to and reflective of statutory purpose and multilateral interests in resource management. How explicitly information provisions are expressed in legislation and whether they are linked to wider resource management goals either within or external to the legislative regime reveals whether resource management is mechanically functional.[22] Linking also reveals how and to what extent other important aspects of human well-being associated with resource management such as distributional fairness, environmental health, human rights and natural capital accounting may be considered.[23] New Zealand's future natural resource law must cohere in its management across different resources.

In seeking to answer the research question, the study of information provisions and processes also showed that their presence (or not) within each legislative regime is ultimately revealing of the state's perception of its role in natural resource management, how it is intended to function and for what purposes. External oversight, formal standards and processes and links with meta-gaols speak of norms, and as this research has argued, of the functions that the state (and Māori) should or need to perform in their custodianship of natural resources.

V Research Answer, Implications and Further Research

In practice, formal information process standards to support environmental law considerations and the application of Te Tiriti principles have not sufficiently supplemented Aotearoa's natural resources law information provisions. While the natural resource bargain as a concept for understanding natural resources law remains relevant, it has limitations in practice,

[20] At 366-390.

[21] At 380 see potential application of clarified official information law.

[22] See the many recommendations by the Resource Management Review Panel in *New Directions* (2020), above n 1, at 374-387.

[23] See Sonette van Zyl and Joey Au *The Start of a Conversation on the Value of New Zealand's Natural Capital* (Living Standards Series: Discussion Paper 18/03, Office of the Chief Economic Adviser, February 2018) at 27; and generally, New Zealand Institute of Economic Research *Capturing Natural Capital in Decision Making: Updated Stocktake of Recent Literature* (Report to The Treasury and Natural Resource Sector Agencies, September 2017). See also Treasury *The Living Standards Framework 2021* (October 2021) at 2 and 3.

particularly in its ability to consider multilateral interests. However, the concept remains useful in demonstrating the need for particular types of information requirements and the accountabilities of resource owner and resource user in natural resource law. The thesis has shown that fundamental reconsideration of the owner and developer roles can be usefully made by examining legal information provisions and processes in natural resources law in the quest for more equitable and ambitious natural resource management systems.

Close examination of the law and regulation for geothermal, fisheries and petroleum resources was undertaken to answer the main research question:

- What legal characteristics are desirable in information requirements for managing natural resources?

The ideal legal characteristics for information requirements in natural resources law (as discussed under Themes A–E above) can be summarised as containing and being reflective of:

- scope and far-sightedness;
- connectivity;
- functional clarity;
- role clarity;
- formalised, reviewable standards;
- legal enforceability and auditability;
- external oversight of content;
- external oversight of process;
- links with meta-goals; and
- Māori–Crown partnership status (and multilateral interests) in language, process and definitions.

As Aotearoa New Zealand embarks on the largest suite of resource management reforms since the enactment of the RMA 1991—and the decade in which all the legislation examined in the thesis was enacted (the 1990s)—this research has found that many gaps identified by the resource management reform Review Panel are explicitly linked to resource monitoring, shortfalls in information and data about resource use and in data management systems and shortfalls in environmental reporting, auditing, "feedback loops" and national-level oversight. These issues and the lessons learned from them all connect to the themes explored in this thesis. While the resource management reform relates to the terrestrial environment, the shortfalls identified also provide lessons for oceans resource management, including fisheries

management. Greater involvement of Māori in resource management decision-making was also identified as central in resource management reform and the need for substantive and procedural mechanisms to give effect to Te Tiriti o Waitangi.

The implications of this study and the identification of optimal legal characteristics for information provisions in natural resource management have application not only within the respective legal regimes examined here. They also have wider application and implications for building stronger natural resource and environmental law in the 21st century and beyond. Formalising standards (for data, technical modelling and peer review), linking resource-use information and data to regional and national resource planning and environmental reporting, ensuring effective participation of multilateral interests in decision-making and ensuring more equitable distribution of the benefits of public ownership in natural resources are key. These key considerations will all have implications for the types of information required of resource managers and resource users and their respective accountabilities which are ultimately to Te Tiriti partners, to the public and to future generations.

Further research building on the work of this thesis could explore *how* natural resources and environmental management reform provides an opportunity to craft next-generation legal information requirements. The draft Natural and Built Environments Bill, proposed national-level Strategic Planning Act and government intentions to review the management of Aotearoa's oceans are obvious starting places to examine how optimal legal characteristics for information requirements may be crafted into reformed natural resource law systems. The widened oversight roles for central government agencies will also potentially transform legal information provisions under individual statutory regimes. The application of international law principles regarding public access to environmental information is also relevant to information provisions and the interpretation of official information law and is thus worthy of further research. Continuing legal and multidisciplinary research in *Sustainable Seas* is a fruitful area in which to explore how natural resource information requirements can better serve Māori using Māori terms of reference and worldview. Lessons gleaned from pluralistic and decentred examples of resource management such as the Ahu Moana models which emphasise human well-being considerations will also provide important case examples of next-generation information needs and how (potential) legal personhood for natural resources may manifest in practice. Whether Aotearoa New Zealand should give constitutional-level protection for resources, the environment, human rights and Māori rights guaranteed by Te Tiriti remains a germane question warranting further research as affecting legal provisions for information.

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