Aligning Organisational Environmental Policy and Practice in the Australian Coal Industry

By

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I certify that the work presented in this thesis is, to the best of my knowledge and belief, original, except as acknowledged in the text, and that the material has not been submitted, either in whole or in part, for a degree at this or any other university.

I acknowledge that I have read and understood the University’s rules, requirements, procedures and policy relating to my higher degree research award and to my thesis. I certify that I have complied with the rules, requirements, procedures and policy of the University.

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Abstract

The aim of this study is to determine how well environmental sustainability policy and practice align in Australian coal mining organisations, and how any misalignment can be dealt with. An environmentally sustainable organisation can be classed as one which works with society towards ecological renewal (Benn & Dunphy 2004). In policy terms, organisations are aiming to be environmentally sustainable. This study investigates the factors helping and hindering attempts to achieve policy aims. Such information is vital to the industry as it highlights the key areas which need to be addressed before environmental sustainability can become a reality.

The methods developed as part of this study could be adopted by any organisation wishing to become more environmentally sustainable. They provide a practical means for assessing current environmental sustainability performance levels, the different environmental sustainability performance levels they can aspire to achieve, what is preventing them from achieving their goals, and an effective action plan for reaching their targets. Such a holistic approach to organisational environmental sustainability improvement is lacking at present.

Espoused theory, institutional theory, institutional logic and field theory underpinned the theoretical framework for the study. To measure environmental sustainability performance, Dunphy et al.’s (2003) sustainability Phase Model was utilised. A qualitative, industry-wide case study was undertaken to investigate the research aim and subsequent research questions. The research was conducted in three phases which consisted of a document review of publicly available company sustainability information, an online qualitative questionnaire and in-depth interviews. In all, data was obtained from 32 different mining industry organisations for the study.

The findings suggest that in practice, organisations in the industry are not aligning with their environmental sustainability policies in two ways. Firstly, on the ground, companies are aiming for a much lower standard of environmental performance than those stated in their policies. Secondly, they are performing at a level much lower than their policy stipulates. The greatest driving force for improving environmental sustainability was found to be community pressure and the greatest restraining force, regulation. The institutional logic for why the environment is managed the way it is in the industry was found to be maintaining a licence to operate, which in itself, is a major restraining force for improvement. Recommendations developed by the participants for how the industry could go about becoming more environmentally sustainable mainly centred on improving regulations.
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Glossary of Terms

**Change management:** ‘The management of change and development within a business or similar organisation’ (Oxford Online Dictionary 2014).

**Critical reflection:** ‘The process by which one may identify the assumptions governing one’s actions, question them, and develop alternative behaviours’ (Savaya & Gardner 2012, p.145).

**Driving force:** Any force present in a particular situation pushing towards a particular change (Lewin 1951).

**Environmental footprint:** ‘The effect that a person, company, activity etc. has on the environment, for example the amount of natural resources that they use and the amount of harmful gases that they produce’ (Cambridge Online Dictionary 2014).

**Environmental management:** Any efforts made to control impacts on the environment caused by operations.

**Environmental performance:** The overall performance level of the environmental management efforts at a department, mine site, organisational or industry level. The six performance levels adopted were developed by Dunphy et al. (2003) in their sustainability Phase Model. They are rejection, non-responsiveness, compliance, efficiency, strategic proactivity and the sustaining organisation.

**Environmental professional:** An organisational professional in the Australian mining industry who is accountable for environmental management as part of their position description.

**Environmental sustainability:** ‘Meeting the resource and services needs of current and future generations without compromising the health of the ecosystems that provide them, and more specifically, a condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor by our actions diminishing biological diversity’ (Morelli 2013, p.6).
**Environmental target:** The overarching environmental performance target for a department, mine site, organisation or industry.

**Espoused theories:** Those which detail a planned course of action. These are in contrast to theories-in-use which pertain to actual courses of action (Argyris & Schon 1974).

**Force field analysis:** A five-step change management process used to determine a situational status quo, what the desired change is, what forces are helping achieve that goal, what forces are hindering efforts of achieving the goal and what action needs to be taken to achieve the desired change (Schwering 2003).

**Industry:** The Australian coal mining industry.

**Institutional logic:** ‘The socially constructed, historical patterns of material practices, assumptions, values, beliefs and rules by which individuals produce and reproduce their material subsistence, organise time and space, and provide meaning to their social reality’ (Thornton & Ocasio 1999, p.804).

**Institution:** ‘Shared rules and typifications that identify categories of social actors and their appropriate activities or relationships’ (Barley & Tolbert 1997, p.4).

**Institutional order:** Differing levels of the institution of which the Australian coal mining industry is part. For this study, they include the individual, department, mine site, organisation and Industry orders.

**Licence to operate:** Acceptance or approval continually granted to an organisation’s operations or project by the local community and other stakeholders. It varies between stakeholders and across time (Australian Centre for Corporate Social Responsibility 2014).

**Organisational behaviour:** ‘The study of human behaviour in organisational settings, the interface between human behaviour and the organisation, and the organisation itself’ (Griffin & Moorhead 2011, p.4).

**Planned change:** ‘A change that happens as a result of specific efforts on the part of a change agent’ (Wood et al. 2006, p.546).
Restraining force: Any force present in a situation resisting a particular change (Lewin 1951).

Sustainability scale: A six-phase scale pertaining to the level of environmental sustainability of an organisation. The six phases are: rejection, non-responsiveness, compliance, efficiency, strategic proactivity and the sustaining organisation (Dunphy et al. 2003).

Sustainability: ‘The state that results from sustainable development’(Benn & Kearins 2012, p.536).

Sustainable development: ‘Development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (The World Commission on Environment and Development 1987, p.43).
Chapter 1 Introduction

1.1 Introduction

The aim of this research is to determine how well aligned environmental sustainability policy and practice is in the Australian coal mining industry, and how any misalignment can be dealt with. The study approaches this issue from an organisational perspective (i.e. it examines the issues affecting environmental sustainability in coal mining organisations). It identifies exactly what needs to change for organisations to achieve their environmental sustainability targets. In doing so, it provides guidance which is currently lacking for the Industry to become more sustainable.

This chapter discusses the background to the research, the context of the study and the justification for undertaking it. It details the research questions posed and provides a brief overview of the methods adopted. It then goes on to explain how the thesis is structured before outlining the scope of the research. Figure 1 shows the exact layout of the chapter.

Figure 1: Outline of Chapter 1
1.2 Background to the research

According to the most commonly accepted definition of sustainability, which was developed by the Brundtland Commission in 1987 (International Institute for Sustainable Development 2013), a sustainable organisation is one that ‘meets the needs of the present without compromising the ability of future generations to meet their own needs’ (The World Commission on Environment and Development 1987, p.43). That definition pertains to the three main aspects of sustainability – social, economic and environment (Husser et al. 2012). This study only considers the environmental aspect of sustainability. A definition of an environmentally sustainable organisation is one that ‘works with society towards ecological renewal’ (Benn & Dunphy 2004).

Many organisations publicly state their desire to operate sustainably through outlets such as social media, company reports and advertising. How well organisations are performing against their sustainability objectives is harder to ascertain, however. As can be seen by the definitions provided above, the term ‘sustainability’ is ambiguous and subjective. There are blurred lines around what constitutes operating sustainably, and those who choose to report on performance often do so voluntarily without having to adhere to standard reporting criteria (Azzone et al. 1997; Husser et al. 2012; Jenkins & Yakovleva 2006). Thus, it becomes difficult to understand how well companies are performing or to make comparisons between organisations.

With confusion around what organisational sustainability actually is and how close organisations are coming to achieving it, there is also likely to be confusion around whether companies need to improve in order to achieve their sustainability goals (Doppelt 2010). This then raises the issue of knowing what actions they should take if they do embark on becoming more sustainable, considering they do not really know how far off the target they are, or even what the target is (Dunphy et al. 2007).

The aspect of sustainability focussed on in this study is environmental sustainability. Environmental sustainability in mining has become increasingly important in recent years (Dashwood 2012; Fitzpatrick et al. 2011; Jenkins & Yakovleva 2006). As mining operations have the potential to largely impact not only their immediate environment, but also their surrounding communities, these operations have many interested and affected stakeholders (Kemp 2010).

The environmental impact of coal mining in particular has been in the spotlight in recent years given its potential to contribute to climate change and the fundamental fact that it is not a renewable energy source (World Coal Association 2014). This is in addition to the increasing competition for land-use around the world, which, in turn, sees mining operations encroach more and more on communities (Prno & Slocombe 2012). Coal mining is one of Australia’s most important industries, creating
significant employment and contributing a considerable amount to the nation’s economy (Australian Coal Association 2013a; Department of Industry and Science 2014). As a result, the industry bears great responsibility to act in an environmentally responsible manner (Minerals Council of Australia 2012).

The industry seems to be aware of this obligation, as can be seen by the publicly stated environmental aspirations posted on company websites. As will be discussed in the following chapters, the major Australian coal mining companies all aspire to be sustainable and reduce their environmental impact as much as possible. Some even aim to have no impact on the environment at all. It is apparent that mining companies know where they want to be in terms of environmental performance. The question is, where are they now and how do they get to where they want to be? In order to establish how well policy and practice align, a critical reflection on the situation should be undertaken (Savaya & Gardner 2012). This study responds to this gap in knowledge.

When organisations know what they are aiming for, they can make planned changes to their management efforts to achieve that aim. There is extensive literature on the topic of change management. This is perhaps because organisational success – indeed, organisational survival – depends on an ability to adapt and transform (Ashurst & Hodges 2010). If mining organisations are to achieve their goals of becoming more sustainable, taking a planned change management approach should enable them to do so.

Researchers are increasingly seeing the importance of planned change management for the effective introduction of environmental management projects (Benn et al. 2006; Doppelt 2010; Lozano 2012; Ronnenberg et al. 2011). In fact, without incorporating change management into the introduction of environmental initiatives, they are most likely doomed to fail (Hoffman 2010). Not only is change management important in the initial introduction of projects, it is also essential for imbedding sustainable practices in any business (Benn et al. 2006).

Many leaders involved in organisational change are currently using force field analysis to help them identify and address the key leverage points in their respective change processes (Lan & Lee 1996; Schwering 2003; Swanson & Creed 2013). The concept of force field analysis was developed by Kurt Lewin in 1951. It enables those utilising it to assess their current situation to understand what needs to be changed. It determines what factors are likely to help bring about the desired change (driving forces) and what is likely to obstruct it (restraining forces). Once the restraining forces are determined, they can be targeted and eliminated or reduced so that the planned change target can be achieved. The plan stating how the restraining forces are to be managed essentially forms an action plan and is the final step of the force field analysis (Schwering 2003).
Although coal mining companies in Australia appear to know what their overarching environmental targets are (as stated on their websites), there is limited information on how the industry as a whole is performing in relation to these targets and what is helping and hindering organisations within the industry from reaching their targets. Perhaps more importantly, clear and practical, industry-specific guidance is lacking on how organisations can become more sustainable. Hence, force field analysis is an appropriate tool for providing the industry with the information it needs to achieve its goals.

Espoused theory is discussed throughout the study as a possible explanation for any differences between policy and practice. Espoused theory highlights that there can be a difference between what course of action is planned for and what actually happens in a given situation (Argyris & Schon 1974). In other words, despite the best of intentions, sometimes things may not turn out as planned.

The study also considers institutional forces and institutional logic as part of the force field analysis. It is thought that both types of factors could help or hinder environmental management efforts (Rivera & Delmas 2004). Institutional theory considers the forces at play which drive an organisation to behave in a certain way. Institutional logic is considered for the thought processes behind why the environment is managed the way it is in the industry (Thornton & Ocasio 2008).

In terms of measuring differing environmental sustainability performance levels, the sustainability Phase Model developed by Dunphy et al. (2003) was utilised. It was seen as the most appropriate scale to use as it provides much more detail about the differing levels of sustainability and environmental performance than the traditional three-level model (i.e. not legally compliant, compliant and beyond compliant). As a result, greater insight was obtained into how the industry is performing.

The end result of the study is a snapshot of how the industry is currently performing in regards to environmental sustainability, where it wants to be, what is driving it towards its goal, and what is preventing it from achieving its goal. It also establishes an action plan for how the industry can become more sustainable. All of this information is necessary if policy and practice are to align.

1.3 Research context – the Australian coal mining industry

Coal remains the primary fuel for electricity power generation worldwide (CSIRO 2014). Australia has the fourth-largest share of proven coal reserves in the world (Australians for Coal 2014). It contributes more than 75 per cent of Australia’s electricity needs and is one of our largest export earners (CSIRO 2014). There are two types of coal – black and brown – and both are mined in Australia. Black coal can be used for electricity generation or coke making (Australian Institute of Energy 2004). Coal used for electricity generation is known as thermal or steaming coal and coal used for coke making (in steel
production) is called either coking coal or Pulverized Coal Injection (PCI) coal (Geoscience Australia 2012). Brown coal, also known as lignite, is also used for electricity generation, although it is a less efficient fuel source than black coal as it has a lower energy content (Powercor 2012).

Coal has been mined in Australia for over 150 years (Powercor 2012). New South Wales and Queensland produce 95% of Australia’s raw black coal. Brown coal is mined in Victoria for use in local electricity generation. Western Australia and South Australia have considerable reserves of sub-bituminous coal which is suitable for local electricity generation and industrial uses but is largely not mined or exported (Australian Institute of Energy 2004, p.5).

There are two main types of mining methods for coal – open-cut and underground, and a third, less common method known as highwall mining. In open-cut mining, which accounts for 80% of coal mining in Australia (Blackwater International Coal Centre 2010), rock covering the coal seam (the overburden) is blasted and removed by large draglines and/or electric or hydraulic shovels and trucks. Modern equipment and techniques allow open-cut mines to be operated to depths much greater than the 60m that was considered a maximum depth for many years (Geoscience Australia 2012).

Underground coal mining in Australia is done by either the bord and pillar or longwall method. In bord and pillar mining, coal is extracted in a series of parallel tunnels (bords) cut at right angles by another series (cut-throughs). This leaves blocks of coal known as pillars which may be extracted in a second stage of mining (Blackwater International Coal Centre 2010). Longwall mining results in large blocks of coal being totally extracted and the mine roof allowed to collapse behind the working face. Generally, longwall techniques result in higher productivity and higher recovery of coal than does the bord and pillar method (Geoscience Australia 2012). However, as a consequence, it has a greater impact on the environment. Highwall mining was introduced into Australia in the early 1990s and uses the void left by open-cut mining to employ remote underground mining equipment to extract coal (Geoscience Australia 2012).

Coal mining, particularly open-cut mining, requires large areas of land to be disturbed. This raises a number of environmental challenges, including soil erosion, dust, noise and water pollution, and impacts on local biodiversity (World Coal Association 2014). Mining organisations are required to rehabilitate their mines as part of their environmental licence, however, mines can be operational for over 40 years (which means that the land is disturbed for that period of time) and rehabilitation criteria for mines can be at a standard much lower than the standard of the land prior to mining (Queensland Government 2007).
Other common environmental issues associated with the industry include the generation and management of waste, mine subsidence and acid mine drainage (World Coal Association 2014). Waste generation includes waste from consumables and the processing of coal. Tailings (the waste from coal washing) is usually sent to tailings dams and is difficult to manage due to its high moisture content (making it geotechnically unstable) (McMillan 2006). Tailings dams pose a high risk for mining operations because if their walls fail, tailings can flow out, contaminating large areas of land and creating a safety risk for humans and animals (NSW Tailings Dam Safety Committee 2012).

Mine subsidence is caused by underground mining (mainly longwall mining). As the land below collapses after resource extraction, depression troughs develop on the surface. This can create surface cracking, loss of soil and vegetation and changes in drainage patterns (World Coal Association 2014). Acid rock drainage or acid mine drainage refers to the acidic water that is created when sulphide minerals are exposed to air and water and, through a natural chemical reaction, produce sulphuric acid. Acid rock drainage has the potential to introduce acidity and dissolved metals into water, which can be harmful to fish and aquatic life (Fraser Institute 2012).

An environmentally sustainable mining operation, according to Dunphy et al. (2003), would be one which worked collaboratively with its stakeholders in the area of environmental management. Such an operation would seek input from interested parties so as to enable and encourage ecological renewal at its site. It would ensure not only that the impacts caused by the operation were remediated to a semi-stable state (as is current practice), but that they were remediated to a state of continual, independent ecological growth and improvement in ecosystem health.

1.4 Research questions

The aim of the study was to determine whether environmental sustainability policy and practice align in the industry and how any misalignment can be dealt with. The following research questions were investigated as a means of drawing some conclusions about the study aim.

1. What is the planned overarching environmental sustainability goal (policy) for the industry?
2. In practice, what is the overarching environmental sustainability goal for the industry?
3. What is the current level of environmental sustainability performance in the industry?
4. What are the drivers (internal and external) for achieving the environmental sustainability goal in the industry?
5. What are the restraining forces (internal and external) that impact environmental sustainability goal attainment in the industry?
6. What is the institutional logic for environmental management in the industry?
7. What would need to happen in the industry for it to reach its overarching environmental sustainability goal?

1.5 Justification for the research

The industry has publicly stated its desire to become sustainable (BHP Billiton 2014; New Hope Group 2014; Peabody Energy 2014; Rio Tinto Coal Australia 2011; Xstrata Coal 2014). In order to be able to achieve this planned change, some sort of change management process needs to take place (Benn & Dunphy 2005; Doppelt 2010; Dunphy et al. 2007; Kotter 1996). Many academic papers have documented the need to incorporate sustainability initiatives into change management processes in order to reach sustainability targets. However, the industry itself appears to be focussing its attention elsewhere.

The Australian Coal Association Research Program (the industry’s self-funded research body) mimics the individual mining organisations’ aspirations of wanting coal mining in Australia to be sustainable. However, a review of all of the Program’s past and present environmental research projects revealed that the industry is funding technological, rather than managerial studies. Technological advancements play a large part in reducing environmental footprints (Bernauer et al. 2006), but organisations also need to ensure that their employees and representatives place a high value on sustainability (Benn & Dunphy 2011; Benn & Kearins 2012; Benn et al. 2013; Doppelt 2003; Dunphy et al. 2007; Dunphy et al. 2007; Hoffman 1999; Metcalf & Benn 2013).

Mudd (2010) acknowledged the need for the Australian mining industry to first assess what the current situation is in regards to sustainability and what is planned for the future so that sustainability can actually be achieved. The industry needs to understand how it is performing against its sustainability target, what is helping or hindering its attempts to achieve it and how it can move forward. This is the information needed for any planned change to be successful (Lewin 1951). Such an approach is a practical one and practical approaches to sustainability are currently lacking in the industry.

This approach to determining how well policy and practice align is known as critical reflection. According to Savaya and Gardner (2012), critical reflection assesses the difference between espoused behaviours and those which are actually taking place. It is important to undertake critical reflection because it can identify what changes need to be made so that there can be a realignment of plans and practice (Mezirow 1990). Critical reflection about environmental sustainability policies can help the industry to make whatever changes are needed to achieve its targets.
1.6 Methods

A comprehensive discussion of the research methodology is provided in Chapter 3. In summary, the constructivist paradigm was used as the lens through which to view the investigation and an inductive research approach was adopted. The methods used to obtain and analyse data were qualitative and the research strategy was case study.

A pilot study was conducted at a small coal mining company prior to the main study in order to determine the best means of data collection. It was concluded that an online document review, online questionnaire and in-depth telephone interviews would be the best options given the remote location of many of the participants.

The main study was conducted in three phases. The first consisted of a document review to establish the planned environmental sustainability targets (or policy). The second was an online qualitative questionnaire to determine what was actually happening within organisations and the third phase was a series of in-depth interviews to obtain information on how the industry could move more effectively towards its targets. The online qualitative questionnaire was conducted with the use of the online survey program, Qualtrics. Responses were also stored and compiled in Qualtrics. Leximancer, an automatic qualitative data analysis program, was used to analyse the data from all three phases of research.

1.7 Structure of thesis

This thesis comprises five chapters. The format is based on Perry’s (2012) standard five-chapter thesis. Perry states that a thesis should have at least five chapters or sections including an introduction, a literature review, methodology, an analysis of data, and conclusions and implications. He claims this is needed to effectively present a thesis. The justifications he uses for this structure are that: it addresses each of the requirements of an Australian PhD thesis outlined by the authoritative Higher Education Research and Development Society of Australia; is based on the established literature about postgraduate research; and has been followed by many postgraduate theses in Australia and overseas universities with no or negligible revisions. The structure of this thesis is outlined in Figure 2.
Chapter 1 provides an introduction to the study and an overview of the entire thesis. It essentially outlines the framework of the thesis and the key aspects of each of the components. Chapter 2 summarises the relevant literature for the research. It presents literature pertaining to the two parent disciplines – environmental management and change management. The gaps in the literature are then identified before a theoretical framework for the research is presented.

Chapter 3 details the approaches used in the study, and how and why they were chosen. It includes the research paradigm adopted, the research methodology and the research design. Chapter 4 displays the results of all the data analysis from the document review, questionnaire and interviews. Chapter 5 then discusses the findings in relation to the research objectives, the conclusions that can be made regarding the research aim and any implications the study has for theory and practice.

1.8 Delimitations

Delimitations differ from limitations in that the researcher generally has control over delimitations during the study, but not limitations (Perry 2012). In other words, delimitations are essentially the boundaries of the research which are decided on by the researcher during the research design phase.
The scope of this research is delimitated to organisations in the Australian coal mining industry only, operating between 2012 and 2014. Although the findings have implications outside of the industry, no claims for the conclusions beyond these delimitations are made. By restricting the focus to coal mining in Australia, the researcher was able to gain a more in-depth insight into the situation being investigated. The findings were therefore perhaps more comprehensive and detailed than could have been found if the study was widened to other aspects of mining.

The study focuses on factors affecting environmental management from an organisational perspective. Therefore, only the views of those working in environmental management in the industry were canvassed. Other stakeholders’ views were not taken into consideration as it was believed that they would have limited knowledge or understanding of intra-organisational issues affecting environmental sustainability in mining companies.

The mining organisation documents reviewed for the main study (as opposed to the pilot study) were all publicly available. Mining company environmental policies and website statements analysed were the most recent at the time of analysis. Private, in-house documents were not sought. Questionnaire and interview participants were selected based on their experience and their inside knowledge of issues affecting environmental management in the industry. They were regarded as key informants and, as such, were deemed to be suited to providing all of the information necessary for the research to be comprehensive and accurate (Marshall 1996).

1.9 Summary

This chapter set out the foundations of the thesis. It discussed the background to the research, the research problems and the justification for the research. It detailed the methods used in the study, as well as how the thesis is structured. Delimitations of the scope of the research and key assumptions were also highlighted. With these foundations now in place, a more detailed description of the research can be presented in the chapters which follow.

Australian coal mining organisations are publicly stating their aims to become environmentally sustainable. Whether they are actually aiming for this target in practice is unknown. It is also not clear, how they are performing against their targets, or how they can achieve their targets if they are not currently doing so. This study addresses these gaps in knowledge. In doing so, it also provides a methodological framework for any organisation wishing to align environmental sustainability policy and practice.
Chapter 2  Literature Review

2.1 Introduction

This research is centred on enabling coal mining companies in Australia to become more environmentally sustainable. Change is desired within the industry in the area of environmental management. As the general target (of becoming environmentally sustainable) is already known and well documented on company websites, the change can be planned. The types of factors that are likely to help or hinder the planned change need to be known in order for an effective action plan to be developed for the change effort to be successful (Lewin 1951). There is existing body of literature on these topics which had to be reviewed prior to developing the research framework to ensure that the research did not repeat existing research and that it would create new knowledge.

The two primary areas of literature which are relevant to this study are environmental management and organisational change management. The areas of corporate social responsibility, sustainability and environmental management in the context of mining are pertinent in the environmental management literature. Within the change management literature, planned change management, driving and restraining forces for change, change management in mining, and force field analysis are particularly applicable.

This chapter reflects on the existing knowledge on the subjects mentioned above. It compares different authors’ views on issues and highlights exemplary studies. It identifies patterns and trends in the literature and also gaps in previous research. The chapter then goes on to introduce the research objectives for the project and the theoretical framework. Figure 3 outlines the structure of the chapter.
2.2 Environmental management literature

2.2.1 History of environmental management in organisations

The study of environmental management has stemmed from the much broader field of corporate social responsibility. To understand the foundations of environmental management, the history of corporate social responsibility must be considered. The most commonly used definition of corporate social responsibility in recent literature refers to the beyond-law obligations which companies must adhere to because their economic activities affect the social and ecological systems in which they are embedded (Culpeper & Whiteman 1998, p.24; Dashwood 2012).

It is commonly acknowledged that corporations will act above and beyond what is officially required of them with regard to their social and environmental legal obligations (i.e. undertake corporate social responsibility initiatives) as a means of appeasing their stakeholders and the communities in which they operate (Stoughton & Ludema 2012; Culpeper & Whiteman 1998; Husser et al. 2012; Brammer et al. 2012). Not doing so can have dire consequences for their businesses and can even lead to the cessation of their operations (Prno & Slomcombe 2012). Thus, gaining the social acceptance of operations’ communities and stakeholders is essential for corporations (Benn & Dunphy 2005; Kemp 2010).
This social acceptance of organisations by stakeholders and communities is known as the social licence to operate. The official definition of social licence to operate is the ‘acceptance or approval continually granted to an organisation’s operations or project by the local community and other stakeholders. It varies between stakeholders and across time’ (Australian Centre for Corporate Social Responsibility 2014).

Communities are usually concerned with the potential negative impacts that a corporation could have on them, whether they be social or environmental (Benn & Dunphy 2005). They want to make sure that the organisations do not have permanent detrimental effects on their current or future way of life (Prno & Slocombe 2012). This is where the term ‘sustainable development’ becomes important for companies.

The most commonly referred to definition of sustainable development is still the one put forward in 1987 by the Brundtland Commission: ‘Development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (Seiffert & Loch 2005, p.1198). This definition was the basis of the 1992 Earth Summit, the 2002 United Nations Conference on Environment and Development, and the 2012 Rio +20 Earth Summit.

Over the past 60 years, research in the field of corporate social responsibility has increased dramatically (Carroll 1999). In the early 1950s, discussions focussed primarily on the responsibilities of corporations versus governments. Later, environmental responsibility became a major issue on the public agenda and from the early 1990s, industrialised countries witnessed a revival of the broader corporate social responsibility concept (Zollo et al. 2009, p.356).

In 1992 the Earth Summit in Rio de Janeiro, organised by the UN Commission on Environment and Development, helped to establish the concept of sustainable development as a policy goal for nations and as a basis for intergovernmental cooperation. The summit was important in making a call for business and civic organisations to engage with the challenge of sustainable development (Fitzpatrick et al. 2011).

Since the Earth Summit, societies’ expectations of corporations have continued to evolve as more people recognise the power of corporations and that there are limits to the ability of governments to control or shape their behaviour (Bendell et al. 2011). The rise of the multinational corporation and the internationalisation of financial markets have taken the power of the modern corporation to the point where it can represent a formidable challenge to the authority of the nation state, let alone small groups of citizens (Dunphy et al., 2007 p.4).
The Earth Summit encouraged companies to engage in more voluntary initiatives to integrate social or environmental considerations in their operations. It also led to more partnerships between companies, non-governmental organisations and government agencies to improve the social and environmental performance of companies and to fund other activities towards sustainable development (Murphy & Bendell 1997).

Phenomena such as global warming and the depletion of natural resources have kept the focus on corporate social responsibility (Hockerts & Wüstenhagen 2010). This focus has raised the profile of corporate social responsibility in many corporations. Research has indicated that companies go through distinct stages of maturity as they develop their sense of corporate responsibility (Li 2006). Bendell (2009) developed the Corporate Responsibility Pyramid (Figure 4) which suggests that organisations go through the stages of philanthropy, reputational management, strategic responsibility, societal innovation and societal leadership as their sense of social responsibility evolves.

![Figure 4: The Corporate Responsibility Pyramid (adapted from Bendell, 2009 p.12)](image)

As suggested by Bendell (2009), the emerging consensus seems to point towards a notion of corporate social responsibility that goes significantly beyond philanthropic giving in the community and focuses on responsible decision-making and practice in all business activities such as strategic planning, human resource policies, auditing and reporting.
Corporate social responsibility in mining

Mining activities profoundly transform the landscapes and socio-economic patterns of affected countries and communities. For a long time, these impacts have been somewhat tolerated by society because of minerals’ many benefits, but the escalating environmental crisis is generating widespread public demands for a sustainable mineral industry (Fitzpatrick et al. 2011, p.377). Many of the environmental disasters that have contributed to the growing public concern about corporate social responsibility over the past half century have taken place in the mining industry (Warhurst 2001). The 1996 tailings failure at Placer Dome’s Marcopper mine in the Philippines and the collapse in 1998 in Spain of the tailings dam at the Aznalcollar mine are two note-worthy examples (Dashwood 2012).

Following those disasters, there was a tightening of environmental regulations whereby mining companies had to post bonds towards post-mine closure environmental cleanup and new mines had to go through an environmental approval process before being allowed to operate (Dashwood 2012). Mining companies seeking finance for new development projects in the developing world also encountered environmental conditions attached to the loans they sought from agencies such as the World Bank, the International Finance Corporation (IFC) and private banks (Dashwood 2012, p.120).

In an effort to promote corporate sustainability, numerous voluntary standards and initiatives have been developed for the mining industry (Kemp et al. 2010). The first significant initiative was developed by the Mining Association of Canada in 1993 (Figure 5). The initiative, known as the Whitehorse Mining Initiative (WMI) was the result of growing pressure on Canadian mining companies to consider their environmental and social impacts in the 1980s. It was a comprehensive national roundtable funded by industry and governments with the ambitious goal of achieving a consensus among diverse groups including the Canadian environmental network, aboriginal organisations, labour, government and the mineral industry (Fitzpatrick et al. 2011, p.377).

In 1998, the Global Mining Initiative (GMI) was initiated. The founders were the world’s leading mining companies including Rio Tinto, Anglo American, BHP Billiton, Freeport McMoRan, Newmont and WMC, all of which had seriously had problematic environmental and social records (Whitmore 2006). In 1999, The US-based Coalition for Environmentally Responsible Economies established the Global Reporting Initiative. It aimed to ‘bring together the numerous initiatives on corporate environmental reporting that had developed independently around the world and help shape them into one set of coherent global standards’ (Jenkins & Yakovleva 2006, p.274).

In 2000, nine of the world’s largest mining companies decided to initiate a project to examine the role of the minerals sector in contributing to sustainable development, and how that contribution could be
increased. It was labelled the Mining, Minerals and Sustainable Development Project (MMSD) and ran for two years in total. The group was tasked to: assess the global mining and minerals sector in terms of the transition to sustainable development; identify how the services provided through the minerals supply chain can be delivered in ways that support sustainable development; propose key elements for improving the minerals system; and build platforms of analysis and engagement for ongoing communication and networking among all stakeholders in the sector (International Institute for Environment and Development 2002).

The WMI preceded the International Council on Mining and Metals’ (ICMM’s) Sustainable Development Framework of 2003. The framework is a set of 10 guiding principles for its member companies on implementing sustainable development in their operations (Laurence 2011). The principles are based on findings from the Minerals and Sustainable Development (MMSD) project, which gathered input from over 150 individuals and organisations to determine the role that the sector could play in sustainable development (Fitzpatrick et al. 2011, p.377).

In 2005, the Minerals Council of Australia (MCA) developed a set of principles known as Enduring Value. All of Australia’s largest mining companies such as BMA, Rio Tinto and Anglo Coal and many of the country’s smaller companies such as New Hope Coal are members of the MCA. Enduring Value was developed to:

- align with global industry initiatives, and in particular provide critical guidance on the International Council on Mining and Metals (ICMM) Sustainable Development Framework Principles and their application at the operational level
• build on the Australian Minerals Industry Code for Environmental Management – the platform for industry's continual improvement in managing environmental issues since its introduction in 1996

• provide a vehicle for industry differentiation and leadership, building reputational capital with the community, government and the finance and insurance sectors

• assist the industry to operate in a manner which is attuned to the expectations of the community, and which seeks to maximise the long-term benefits to society that can be achieved through the effective management of Australia's natural resources (Minerals Council of Australia 2012).

Corporate social and environmental disclosure has grown considerably over the last 20 years. It encompasses the voluntary and mandatory disclosures made by companies regarding issues that are important to a wide range of stakeholders (Jenkins & Yakovleva 2006, p.273). Examples of where companies may disclose such information include sustainability reports, annual reports and stories posted on their company websites. In most countries, environmental and social reporting is voluntary and there are no definite rules concerning form and content (Azzone et al. 1997). Therefore, although disclosing voluntary information is a step in the right direction towards sustainability in terms of corporate accountability, there are concerns over the legitimacy and standardised information in the public reports.

Corporate social responsibility and voluntary initiatives are considered important for mining companies as public opinion of the sector as a whole is poor (Jenkins & Yakovleva 2006, p.272). In addition, pressure groups have continually targeted the sector at the local and international levels, challenging the industry's legitimacy and consequently maintaining a social licence to operate is a constant challenge for the industry (Walker & Howard 2002).

The term ‘sustainable mining’ can either refer to the simple longevity of a mining operation, or, as in the focus of this study, the incorporation of sustainable development principles in the management of mines (Han Onn & Woodley 2014). The latter considers the impacts that an operation may have on their communities and the environment. Traditionally, mining was considered sustainable if it was conducted in a way which balances economic, environmental and social impacts (often referred to as the triple bottom line) (Rajaram et al. 2005). This model has since matured, however, and now also includes aspects such as safety and resource efficiency (Laurence 2011).

With regard to the mining of resources such as coal and other non-renewables, operations may not be ultimately sustainable given the first definition of sustainable mining, as the resource will eventually run
out. That said, when considered in terms of the second definition, the mining of non-renewables could, in principle, be regarded as sustainable as long as due consideration was given to the environmental and social impacts of the operation (including lasting impacts following the closure of the mine). To date, attempts by the mining industry to apply sustainable development principles in practice remains the subject of much debate, with little agreement as to whether mining can ever be compatible with a sustainability agenda (Fitzpatrick et al. 2011, p.376). Some argue that the term ‘sustainable mining’ is an oxymoron (Kirsch 2009), whilst others, such as Jenkins and Yakovleva (2006, p.271), suggest that mining could be sustainable under the following conditions: the depletion of mineral resources is compensated by generation of new wealth in the form of useful lasting capital which can benefit present and future generations; mineral depletion is not an issue due to the possibility of recycling many non-fuel metals and minerals; and there is continuing discovery of new material deposits, and the advancement of technology makes possible the improved recovery of minerals from previously unprofitable deposits.

Other authors have argued that sustainable mining could exist as long as the rate of use of minerals does not exceed the capacity to find new sources, acceptable substitutes or recycle (Laurence 2011, p.278). Other views pertain to the idea that although no mine can last forever, this is irrelevant as sustainability encompasses many more values than the continuing availability of the resource being developed (Laurence 2011).
Environmental management in mining

Environmental management objectives

A study of sustainability communication from 12 of the world’s leading mining companies (and nine of Sweden’s leading mining companies) completed by Nilsson et al. (2013), identified four common mining company sustainability aspirations. The first is that they contribute to sustainable development. The second is the community-orientated claim that mining organisations and their respective communities are ‘all in it together’ or ‘all on the same side’. The third is financially focussed and targets shareholders, saying that the mining companies are an attractive investment opportunity. The final argument emphasises sustainability as a process, suggesting that the mining companies have come a long way from ‘the olden days’ and are on a journey towards sustainability.

In regards to more specific environmental targets (the focus of this study) the Australian coal mining industry has presented some common themes as well. A review of leading mining company websites, environmental policies and annual reports revealed that mining companies are aiming to reduce the environmental impact of their operations. Terms such as ‘sustainable practice’ and ‘minimising harm’ were the most commonly used in regards to environmental targets.

Below is a list of stated environmental targets from the company websites:

- Anglo American: ‘Zero environmental harm’ (Anglo American 2014)
- BHP Billiton: ‘Committed to operating sustainably’ (BHP Billiton 2014)
- Rio Tinto: ‘Minimising environmental impact from operations’ (Rio Tinto Coal Australia 2011)
- Xstrata Coal: ‘Going above environmental compliance’; ‘minimising impacts’; and ‘being sustainable’ (Xstrata Coal 2014)
- Peabody: ‘Leaving the land in equal or better condition than what it was prior to being mined’ (Peabody Energy 2014)

Notably, it seems apparent that mining companies are striving to reduce their impacts. Their targets are centred on reducing harm to the environment rather than simply meeting their licence conditions. Such aspirations indicate a certain level of proactiveness by the mining companies in respect to environmental management.

It should be noted, however, that simply because organisations claim that they are aiming to achieve high levels of environmental performance does not necessarily mean that they are doing so in practice. There are many documented cases where organisations use sustainability for public relations purposes.
without actually taking action to become more sustainable (Benn et al. 2010). They give the impression that their organisations are good corporate social citizens, but in reality, they have little interest in sustainability at all (Gurská & Válová 2013).

**Performance measurement**

Having environmental demands thrust onto organisations by external parties is one thing. Having clear and measurable environmental performance targets is another. Besides monitoring the amount of community outrage caused by an operation, there is no clear way to measure how an operation is performing against its social licence to operate. Rather, operations either have the licence or they do not (Gunningham et al. 2004).

To date, overall environmental performance for an operation (as opposed to specific aspect impact performance such as the degree of compliance with water use or dust emissions regulations) is generally placed into one of three broad categories: non-legally compliant, legally compliant and beyond compliant (Jones 2010; Sindhi & Kumar 2012). A site which is operating at the beyond compliance level is one which is undertaking proactive or voluntary environmental improvement initiatives (Liu et al. 2010). Dunphy et al. (2003) go further to suggest that operations can be operating at one of six different levels in relation to sustainability. Table 1 outlines the different ecological sustainability attributes of each of these levels of sustainability.

**Table 1: Organisational sustainability scale (adopted from Benn and Dunphy 2004, p.99)**

<table>
<thead>
<tr>
<th>Organisational sustainability level</th>
<th>Ecological sustainability attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong> Rejection</td>
<td>The environment is regarded as a free good to be exploited.</td>
</tr>
<tr>
<td><strong>Level 2</strong> Non-Responsiveness</td>
<td>Environmental risks, costs, opportunities and imperatives are seen as irrelevant.</td>
</tr>
<tr>
<td><strong>Level 3</strong> Compliance</td>
<td>Ecological issues likely to attract strong litigation or strong community action are addressed.</td>
</tr>
<tr>
<td><strong>Level 4</strong> Efficiency</td>
<td>ISO 14000 integrated with TQM and OH&amp;S systems or other systematic approaches with the aim of achieving eco-efficiencies. Sales of by-products.</td>
</tr>
<tr>
<td><strong>Level 5</strong> Strategic Pro-activity</td>
<td>Proactive environmental strategies are seen as a source of competitive advantage.</td>
</tr>
<tr>
<td><strong>Level 6</strong> The Sustaining Corporation</td>
<td>The firm works with society towards ecological renewal.</td>
</tr>
</tbody>
</table>
The Dunphy et al. (2003) model is just one of many staged corporate environmental models. Each of these describes a series of stages by which companies become more environmentally conscious (Schaefer & Harvey 1998). Other examples include Newman’s (1993) reactive, proactive and innovative model, Winsemius and Guntram’s (1992) reactive, receptive, constructive and proactive model, and Roome’s (1992) non-compliance, compliance, compliance-plus, commercial and environmental excellence model. More recently, sustainability models which focus on more than just the environmental aspects of an organisation have been developed. Nidumolu et al.’s (2009) model, for example, considers five stages of organisational sustainability – viewing compliance as an opportunity, making value chains sustainable, designing sustainable products and services, developing new business models and creating new practice platforms.

The staged models do not come without criticism. Some suggest that they do not give sufficient attention to multiple dimensions of change in an organisation and have a limited vision of strategy (Schaefer & Harvey 1998). In response to this, contingency models were developed to equip managers with strategic tools to address organisational complexities. The Hart and Milstein (2003) model is one such contingency model. It attempts to incorporate internal and external change factors, along with immediate and long-term goals, with the aim of delivering shareholder value.

Despite the potential for the contingency models to incorporate more complex organisational environmental issues, they were not the preferred type of model for this study. A staged model was selected because they offer a general guide to the direction that a company should take if it wants to improve environmental performance (Schaefer & Harvey 1998, p.119). Staged models also enable comparison between companies and business units (Benn et al. 2006, p.156).

The researcher selected a staged model as a means of measuring performance, rather than a framework for how organisations should progressively mature in relation to environmental sustainability. In this vein, the debate over whether organisations develop through set stages or as a product of the pressures present in their current situation is not relevant to the study.

The Dunphy et al. (2003) model specifically was selected as it provided clear success criteria for ecological sustainability at each of the stages. Others appeared very broad and difficult to measure. It also had sustainability (the sustaining organisation) as the ultimate environmental sustainability phase at which an organisation could operate, which was the best fit for the aim of the study. Finally, Dunphy et al. (2003) gave due focus to human resource management and change management in their research, a key aspect missing in many of the other models, but one which is also very relevant to this study.
This scale was seen as the most appropriate for this study as it offers the most insight on the different phases organisations go through on their way to becoming sustainable organisations. The historic three-category environmental performance scale does not provide the level of detail sought after for this study in that it does not address sustainability per se, only how organisations compare in relation to compliance, and compliance can be anywhere from completely unsustainable to completely sustainable depending on where they are and what kind of operation they have (Boele et al. 2001; Gandhi et al. 2006).

According to Dunphy et al. (2003) organisations at the compliance level in the Australian coal industry would be addressing issues which are of the greatest focus for the regulating bodies and, as such, would cause litigation if they were not complied with. Issues such as mine-affected water management or dust nuisance which have been in the media spotlight would likely be areas of concern for regulators, and consequently for mining organisations, in the current era. Organisations operating at the sustaining corporation level would be actively seeking input from their communities and broader society as to what could bring about ecological renewal at their operations.

**Legal compliance requirements in the industry**

There are numerous pieces of legislation and regulations relating to environmental management in coal mining operations in Australia. For example, a standard coal mine in Queensland has to comply with all of the relevant requirements in the legal documents listed in Table 2.

**Table 2: Example of environmental legislation relevant for a coal mining operation in Australia**

<table>
<thead>
<tr>
<th>Type of legislation</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>State environmental licence</td>
<td><em>Environmental Authority (QLD), Environmental Protection Licence (NSW).</em></td>
</tr>
<tr>
<td>Commonwealth act</td>
<td><em>Clean Energy Act 2011</em></td>
</tr>
<tr>
<td>Commonwealth act</td>
<td><em>Environment Protection and Biodiversity Conservation Act 1999</em></td>
</tr>
<tr>
<td>Commonwealth regulation</td>
<td><em>Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995</em></td>
</tr>
<tr>
<td>Commonwealth act</td>
<td><em>National Greenhouse and Energy Reporting Act 2007</em></td>
</tr>
<tr>
<td>State act</td>
<td><em>Aboriginal Cultural Heritage Act 2003</em></td>
</tr>
<tr>
<td>Type of legislation</td>
<td>Title</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------</td>
</tr>
<tr>
<td>State act</td>
<td>Water Supply (Safety and Reliability) Act 2008</td>
</tr>
<tr>
<td>State act</td>
<td>Clean Energy Act 2008</td>
</tr>
<tr>
<td>State regulation</td>
<td>Dangerous Goods Safety Management Regulation 2001</td>
</tr>
<tr>
<td>State act</td>
<td>Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012</td>
</tr>
<tr>
<td>State act</td>
<td>Environmental Protection Act 1994</td>
</tr>
<tr>
<td>State act</td>
<td>Environmental Protection Regulation 1998</td>
</tr>
<tr>
<td>State regulation</td>
<td>Environmental Protection (Waste Management) Policy 2000</td>
</tr>
<tr>
<td>State regulation</td>
<td>Environment Protection (Water) Policy 2009</td>
</tr>
<tr>
<td>State regulation</td>
<td>Environment Protection (Waste Management) Regulation 2000</td>
</tr>
<tr>
<td>State regulation</td>
<td>Fire and Rescue Service Act 1990</td>
</tr>
<tr>
<td>State act</td>
<td>Land Act 1994</td>
</tr>
<tr>
<td>State act</td>
<td>Land Protection (Pest and Stock Route Management) Act 2002</td>
</tr>
<tr>
<td>State act</td>
<td>Mineral Resources Act 1989</td>
</tr>
<tr>
<td>State act</td>
<td>Nature Conservation Act 1992</td>
</tr>
<tr>
<td>State regulation</td>
<td>Nature Conservation (Protected Plants) Conservation Plan 2001</td>
</tr>
</tbody>
</table>
## Type of legislation | Title
---|---
State regulation | *Nature Conservation (Wildlife Management) Regulation 2006*
State regulation | *Transport Operations (Road Use Management — Dangerous Goods) Regulation 2008*
State act | *Sustainable Planning Act 2009*
State act | *Vegetation Management Act 1999*
State act | *Water Act 2000*
State regulation | *Water Regulation 2000*

A review of the environmental literature suggests that there is a need to consult the literature on organisational change in order to investigate how coal mining companies can achieve their environmental sustainability targets (Doppelt 2010; Dunphy et al. 2003). There is a clear desire by both companies and their stakeholders to reduce environmental harm and make operations more sustainable. In other words, there is a clear desire for organisations within the industry to change. Therefore, the change management literature is pertinent and in need of review for this study.

Planned change, such as the change aspired to by the industry, requires the people in mining organisations to change (Lozano 2012). Therefore, the focus for enabling environmental sustainability now has to be on changing the way employees behave in their organisations (Doppelt 2003; Hoffman 2010; Lozano 2012). The next section discusses the existing literature on this topic.

### 2.3 Change management literature

Organisational change management is a broad topic and the related literature spans across numerous subject fields. Business management, human resource management, psychology, strategy, social science and business leadership are all linked to change management. Models and theories on the topic are continually being built upon or developed and there is ongoing debate about which are the most effective (Ashurst & Hodges 2010).

Despite widespread research on why and how organisations change, what constitutes organisational change is often taken for granted and its definition is avoided (Quattrone & Hopper 2001). Hughes
(2006) suggests that organisational change may be conceptualised as anything that alters the status quo or new ways of organising and working.

Change management literature is dominated by planned and emergent change theories. However, there is no one widely accepted, clear and practical approach to organisational transformation that explains what changes organisations need to make and how to implement them (Ashurst & Hodges 2010, p.219). Planned change management is the focus of this study as planned environmental sustainability targets have been stated by the mining industry.

2.3.1 Kurt Lewin and the history of change management

There is no disputing that Kurt Lewin set the foundations for organisational change (Armenakis & Bedeian 1999). A social scientist, he believed that the key to resolving social conflict was to facilitate learning and so enable individuals to understand and restructure their perceptions of the world around them (Burnes 2004a). One unifying theme throughout all of Lewin’s work was the insight that the group to which a person belongs greatly impacts their perceptions, feelings and actions (Lewin 1997).

Lewin developed Field Theory, Group Dynamics, Action Research and the Three-Step model of change (all of which are discussed in more detail later in the chapter). He saw them as intertwined, however, they are often treated as separate themes of his work (Burnes 2004a). In terms of organisational change, Lewin is known for creating the foundations of the organisational development movement and for creating the first planned change model (the Three-Step model). Lewin was also responsible for the force field analysis tool which is utilised in this study.

Planned change models are used by organisations to move towards a desired vision and overcome inertia to change (Boscherini et al. 2010). Planned change may be referred to as blueprint, top-down, rational, linear or episodic change (Stoker & Page 2009). Planned change management practices include a variety of organisational interventions that, when executed properly and in a manner consistent with internal and external organisational events, facilitate the enactment of organisational change processes (Raineri 2011, p.266). Put simply, if an organisation wishes to change something, they can utilise a planned change management method to achieve that change.

The organisational development movement built on Lewin’s work and it attempts to deal with or initiate change in organisational cultures through action research, which is a collaboration between the change agent and organisational members in the belief that members of the organisation should own their own problems and be responsible for finding solutions. The approach adheres to democratic values, employee participation and giving staff an effective voice (Stoker & Page 2009).
Until the late 1970s, the incremental model of change dominated. Advocates saw change as a process whereby individual parts of an organisation dealt incrementally and separately with one problem and one goal at a time (Burnes 2004a, p.990). There was also a growing body of knowledge centred around Lewin’s concept of organisational development. By the early 1980s there were numerous trends in the field (Poon & Rowley 2010). As identified by Sashkin and Burke (1987), these included: integration of the task and process aspects of organisational development; growing attention to developing organisational development theory; increasing interest in managing conflict in organisational mergers and acquisitions; improved research methodologies; and a significant focus on designing organisational cultures as a means of managing change.

In 1989, Woodman identified an additional two trends in the field of organisational change which were: (1) emerging interest in high performance, high commitment work systems and (2) the applicability of change research in international arenas and social movements (Poon & Rowley 2010). The 1980s also brought about criticism of Lewin’s planned approach to change management. The rise of corporate Japan and a severe economic downturn in the West saw the need for organisations to transform themselves rapidly and often brutally if they were going to survive (Burnes 2005; Burnes 2004b). Lewin’s approach was criticised for only being suitable for organisations that operated in a stable state, and was seen as only being suitable for small-scale projects, as ignoring organisational power and politics and as being top-down and management-driven (Burnes 2004a).

Based on the work of Andrew Pettigrew, another significant perspective of organisational change arose. According to this view known as the processual (or emergent) approach, change involves the inter-relatedness of individuals, groups, organisations and society (Burnes 2004a; Pettigrew & Whipp 1993). Processualists claim that change is a complex and untidy cocktail of rational decision processes, individual perceptions, political struggles and coalition-building (Burnes 2004a, p.989; Huczynski & Buchanan 2001).

To this day, organisational change models can be classified as either planned or emergent (processual). There are supporters for both sides with authors such as Burnes (2004b), Cummings and Worley (2008), Swanson and Creed (2013) and Armenakis and Bedeian (1999) suggesting Lewin’s model is still relevant and has simply been misunderstood and oversimplified by later theorists (this is discussed later in the chapter). Supporters of the emergent model, on the other hand, argue that change in organisations is becoming faster and more complex than ever and, as such, requires models which will take that into consideration (Burnes 2004a). Irrespective of these differing views on change, the planned change models are still the most relevant to this study. Organisations in the mining industry wish to change
their organisations in a particular way. They know what type of change they wish to see and they need to plan for how they are going to make that change occur.

The bureaucratic and inflexible nature of the traditional planned change models led Peters and Waterman (1982) and Kanter (1989) to develop an approach that considered the integrated nature of organisations both internally and within their environments (Burnes 2004a; Kanter 1983). This approach became known as the Culture Excellence approach and it suggested that in order to survive, organisations need to promote their objectives by using loose controls, based on shared values and culture. These objectives need to be pursued through empowered employees using their own initiative (Burnes 2004). At the same time that the Culture Excellence school were criticising planned change, others were claiming that the objectives and outcomes of change programmes were more likely to be determined by power struggles than by a process of consensus building or rational decision-making (Burnes 2004a, p.989). There was much discussion on organisational change at this time, but little consensus.

During the 1990s, there were numerous change management models which considered that a planned approach was the superior method of managing change. Grundy’s (1992) ‘Power Tools for Change’, Kanter et al.’s (1992) ‘Ten Commandments’ and Kotter’s (1995) ‘Eight Steps to Transforming Your Organisation’ (discussed further in this chapter) are just a few. The nomenclature assigned to these popular 1990s offerings typifies a formulaic approach which pre-supposes that organisational change should be a controlled and orderly affair (Graetz & Smith 2010, p.136).

Since then, much of the organisational change literature has focussed on differing viewpoints about what organisations actually are and therefore what kind of change theories are relevant. For example, authors debated whether they are complex systems or institutions. This is in addition to developments on what and who can cause change. This literature is discussed in more detail in subsequent sections. One important revelation in the recent literature is the relevance and applicability of historic planned change theories and models in modern organisations (Burnes 2004b).

**Change management theory**

There has been much discussion and differing opinions on organisational change since the 1970s. Numerous theories have been developed to explain change and they represent the differing ontological views of organisations (Boscherini et al. 2010). There is no one widely accepted theory or model of change, and this adds to the complexity of any change management initiative.

Kurt Lewin was the first to offer change theories when he developed his field theory, group dynamics and action research. Field theory suggests that for any situation at a given time, there is a current state
or ‘status quo’, and the status quo is being maintained by certain conditions or forces (Lewin 1951).

Lewin postulated that group behaviour is an intrinsic set of symbolic interactions and forces that not only affect group structures, but also modify individual behaviour. Therefore, individual behaviour is a function of the group environment or ‘field’ (Burnes 2004b, p.311). If there are any changes in the forces in the field, they cause changes in behaviour (Lewin 1951).

Lewin identified two types of forces in any field which work in opposing directions to change or maintain the status quo. They are driving forces and restraining forces (Lewin 1951). Driving forces push the status quo towards a particular change, whilst restraining forces act against that particular change. Lewin believed that any field was in a constant state of adaption and that life was never without change (Burnes 2004a).

Field theory proposes that if driving and restraining forces could be identified and their strengths determined, one could get an understanding of why individuals, groups and organisations act the way they do. In addition, it proposes that identifying these forces would mean that the way to bring about change would be apparent in that the forces which needed to be strengthened or weakened for the change to occur, would be identifiable (Lewin 1951). Field theory underpins the force field analysis tool which is utilised in the methodology of this study.

The concept of change in field theory was never intended to be a simplistic view of the world. Lewin proposed a highly sophisticated conception of the emergent and dynamic nature of various forces in a situational field, largely in consideration of individual psychological factors as part of group dynamics (Swanson & Creed 2013, p.5). However, with the sequential development of his three-step change model and the force field analysis tool (both discussed later in the chapter) which are easily depicted in simple models and figures, later change theorists made the mistaken assumption that Lewin’s work was simple and did not take into account the complexities of change in the real world (Burnes 2005; Burnes 2004a; Burnes 2004b; Swanson & Creed 2013).

Lewin was also the founder of the infamous Lewin’s Equation, which is still used by psychologists and academics today, as a means of explaining human behaviour (Bond 2013). The precise equation is: 
\[ B = f(P, E) \]
where \( B \) is behaviour, \( P \) is person and \( E \) is environment (Lewin 1943). The equation denotes the intrinsically linked relationship people’s behaviour has with their environment or field. This is relevant to change in that if one factor changes, so do the others. Such a concept was unfounded at the time it was first published in 1936 and is still referred to today by modern psychologists (Sansone et al. 2004).
Group dynamics is another concept attributed to Lewin (Burnes 2004a). He believed that groups place pressure on individuals to conform and therefore, the focus of change should be on groups rather than individuals. He stated that it is fruitless to concentrate on changing the behaviours of individuals because the individual in isolation is constrained by group pressures to conform (Lewin 1997). Through the development of group dynamics, Lewin realised the need to provide a process whereby groups could change their behaviour and this led to the development of action research and the three-step model of change (which is discussed in more detail in the next section).

Action research was developed to answer three main questions: 1. What is the present situation? 2. What are the dangers? 3. What needs to be done? (Lewin 1997). Action research proceeds in a spiral of steps, each of which is composed of a cycle of planning, action and fact finding about the results of the action (Burnes 2004a, p.984). It stresses that for a change to be effective, there must first be a ‘felt need’ that change is necessary and it must take place at the group level, and be a participative and collaborative process which involves all of those concerned (Burnes 2004a).

Complexity theories are increasingly being used by organisational theorists and practitioners as a way of understanding change in organisations (Burnes 2004a). They argue that organisations, like complex systems, have large numbers of independent interacting actors. Rather than ever reaching a stable equilibrium, the most adaptive of these complex systems (e.g. tidal zones) keep changing continuously by remaining at the poetically termed ‘edge of chaos’ (Burnes 2004b, p.315). Ironically, although often criticised by complex theorists, many of the underlying assumptions in Lewin’s change theories are similar to those underpinning complexity theories (Swanson & Creed 2013).

**Planned change management models**

Planned change management models were investigated in this study not only in the broader context of change management and its relevance to environmental sustainability change, but also as a means of informing the research methods. The author was in need of a model which would enable her to assess current organisational environmental sustainability performance levels in the industry and compare them to their publicly stated targets. In addition, the model needed to outline how to align current performance with the desired outcomes.

Despite extensive criticism of planned change models, they remain relevant and important for any organisation today (Boscherini et al. 2010). Organisations need to change in order to remain competitive, align with corporate strategies and appease stakeholder demands. If an organisation wishes to influence the direction it is going in, it needs to implement some sort of change management.
strategy. Other models of change may provide some insight into why and how change occurs, but they do not offer direction on how to manage the change.

Hughes (2006) warns of the missing link between change management theories, which are developed by scholars with scholastic terminology, and actual tools that are readily adoptable by organisations. Two planned change models in particular overcame this issue and, therefore, became widely adopted by organisations. Lewin’s three-step change model and Kotter’s eight-step change model have been implemented by organisations to manage change for decades (Appelbaum et al. 2012; Burnes 2004a).

Despite the number of planned change models available for organisations to choose from when initiating change, a vast number of change initiatives still fail. Seventy per cent of change management initiatives fail according to (Ashurst & Hodges 2010). The literature cites issues such as poor leadership, poor communication, lack of vision and resistance to change as being the reasons for these failures. One theme that is consistent throughout the literature, however, is poor planning (Wood et al. 2006).

Lewin excelled in examining this subject. He understood that the current situation needed to be assessed to determine which forces were likely to help or hinder a planned change (Swanson & Creed 2013). He knew that a clear vision of the desired change was required and that an action plan needed to be developed in order to achieve the vision (Boscherini et al. 2010). Furthermore, he knew that unless there were measures in place to institutionalise the change, the change management effort would not be effective (Lewin 1997).

Often cited as Lewin’s key contribution to organisational change, his three-step model, although over 60 years old, is still considered applicable today (Burnes 2004a; Swanson & Creed 2013). Lewin (1951) believed that behaviour was a dynamic balance of forces working in opposite directions which drive or restrain change. According to Lewin, at any given time, a situation is held in a quasi-stationary ‘status quo’ by these forces. Prior to a planned change management effort, these forces can be analysed to determine which forces need to be managed in order for the change to occur (Lewin 1997).

The three-step model considers change to progress through three phases – unfreezing, moving and re-freezing (also referred to as institutionalising). The first phase is concerned with releasing the status quo from its initial institutionalised state so that it can move in a particular direction. In this phase, the sense of urgency for change and the establishment of a vision and the communication of the vision to internal and external stakeholders is required (Lewin 1997).

The second phase is the movement of the status quo towards the desired end state. In the organisational context, this phase concerns the actual implementation of change with new procedures, targets, schedules and reward systems (Boscherini et al. 2010). This is where people within the
organisation are expected to act differently in order to make the change occur. The final phase involves the institutionalisation of the new order, through consolidating improvements to prevent a slip back to the antecedent status quo (Boscherini et al. 2010, p.1071). Should there not be sufficient systems, procedures and support to maintain the change, the situation will drift back towards its initial state (Lewin 1997).

Lewin’s approach has been castigated since the 1970s for being too mechanistic and for having an oversimplified view of organisations and change (Burnes 2004b). However, when considering the four elements which comprise his planned change approach – field theory, group dynamics, action research and the three-step model, it becomes apparent that Lewin’s work provides a rigorous and insightful approach to changing organisations (Burnes 2004a; Burnes 2004b; Swanson & Creed 2013).

After observing many failed planned change methods, John Kotter developed a new planned change management model in the mid-1990s. Kotter identified eight common errors in organisational change efforts, such as failing to create a sufficiently powerful guiding coalition and underestimating the power of vision (Kotter 1996). His model, known as Kotter’s eight-step model, was designed to overcome these common errors (Figure 6).

![Kotter's eight-step change model](adapted from Kotter, 1996 p.21)

In 1997, Kotter’s book on change became a business best seller and it subsequently became the highest selling book ever of its kind (Appelbaum et al. 2012). What is remarkable is that Kotter’s model is still referred to in the literature today. Most attribute the success of the model to its user friendly and practical attributes (Appelbaum et al. 2012).
Kotter’s approach to planned change has also been applied to the Australian mining industry in recent times. In 2011, Ronald Lynch applied the eight-step change process to assessing historic change management efforts at Conzinc Rio Tinto Australia. Such applications of the model demonstrate that it is still relevant and being applied today.

2.3.2 What causes change in organisations?

There is consensus in the literature that change, being triggered by internal or external factors, comes in all shapes, forms and sizes (Ashurst & Hodges 2010, p.225). As discussed previously, change can be planned or unplanned. Planned change occurs when an organisation deliberately attempts to make internal changes to meet specific goals or to pursue a set of strategies. Unplanned change is usually prompted by an external driver such as market forces, an economic crisis or social change (Wood et al. 2006, p.491).

**External drivers for change**

Externally, drivers for change may come from the economic, social, political, technological and legal environment in which an organisation operates (Ashurst & Hodges 2010, p.225). Palmer (2006) goes further to add fashion (stemming from other organisations in the same industry) and reputational pressures as drivers of change. Environmental and external discontinuities can be so strong that they force organisations to completely transform (Cummings & Worley 2008).

**Institutional forces and institutional theory**

Institutional theory has also been used to explain why and how organisations change. The theory perceives organisations as institutions in which social structures have attained a high degree of resilience. They are composed of cultural-cognitive, normative and regulative elements that, together with associated activities and resources, provide stability and meaning to social life. Institutions by definition connote stability but are subject to change processes, both incremental and discontinuous (Björck 2004, p.6).

Scott (2008, p.2) defines institutional theory as attending to the deeper and more resilient aspects of social structure. Institutional theory considers the processes by which structures, including schemas, rules norms and routines, become established as authoritative guidelines for social behaviour. It inquiries into how these elements are created, diffused, adopted, and adapted over space and time, and how they fall into decline and disuse (Scott 2005; Scott 1995).

Scott (2008, p.2) also asserts that institutions are social structures that have attained a high degree of resilience. They are composed of cultural-cognitive, normative, and regulative elements that, together
with associated activities and resources, provide stability and meaning to social life. Institutions are transmitted by various types of carriers, including symbolic systems, relational systems, routines, and artefacts. Institutions operate at different levels of jurisdiction, from global systems to localised interpersonal relationships. Institutions by definition connote stability but are subject to change processes, both incremental and discontinuous.

The literature on institutional theory distinguishes two clear schools of thought – old institutional theory and neo-institutional theory (Meyer 2008). Old institutional theory can be considered any work developed before the 1970s and dates back to the middle of the nineteenth century (Scott 2008). It can be summarised as the moral, habitual, custom and historical pressures which cement social order (Scott 1995). Neo-institutional arguments were first formulated by John Meyer and colleagues in 1977 (Scott 2008). DiMaggio and Powell (1991, p.8) provided a definition of neo-institutional theory by stating it ‘comprises a rejection of rational-actor models, an interest in institutions as independent variables, a turn toward cognitive and cultural explanations, and an interest in properties of supra-individual units of analysis that cannot be reduced to aggregations or direct consequences of individuals’ attributes or motives’. As Meyer (2008) stated, the key concept of the new system was the notion of the actor, whether it be individuals, national states or the organisations created by the individuals and states. Most modern institutional theories see local actors – individuals, organisations or national states – as affected by institutions built up in much wider environments.

The management of change has played a key role in neo-institutional theory, however, it was somewhat absent in classic institutional theory (Fernández-Alles & Valle-Cabrera 2006). Institutional pressures were traditionally linked with inertia. DiMaggio and Powell (1983) described the old way of thinking as change being constrained by institutional forces creating ‘iron cages’ of institutional isomorphism. They described three underlying processes which caused institutions in the same institutional field to become isomorphic: coercive, mimetic and normative processes. Although the concept of institutional isomorphism in institutional theory was later criticised (as discussed later in this section), it provided the basis for what modern institutional theorists consider to be institutional forces.

Scott (1995, p.35) built on DiMaggio and Powell’s work to develop the Three Pillars in institutional theory. Described as being the types of ingredients that underlie institutional order, the Three Pillars comprise regulative, normative and cultural-cognitive elements. Regulative elements stress rule setting, monitoring and sanctioning activities. Normative elements are the prescriptive, evaluative, and obligatory dimensions of social life. Cultural-cognitive elements emphasise the shared conceptions that constitute the nature of social reality and the frames through which meaning is made (Scott 2008).
In the modern organisation, regulative aspects most commonly take the form of legal regulations. Normative aspects generally take the form of rules of thumb, standard operating procedures, occupational standards and educational curricula. Cultural-cognitive aspects include symbols (words, signs and gestures), as well as cultural rules and frameworks that guide understanding of the nature of reality and the frames through which that meaning is developed (Hoffman 1999, p.353). According to Hoffman (1999, p.353), regulative forces guide organisational action through coercion or threat of legal sanctions. Normative aspects guide action through social obligation or professionalisation. Organisations will comply with them out of a sense of moral/ethical obligation or in conformity to norms established by universities, professional training institutions and trade associations. However when it comes to cognitive aspects, organisations will often abide subconsciously or without giving thought as to why. Perhaps the best description of how institutional theory relates to organisations is summarised by Hoffman (1999). He states that organisational fields are areas of power relations wherein field-level constituents engage in institutional war. The outcome of this war is the product of a political negotiation process in which politics, agency relationships, and vested interests guide the formation of institutions that will guide organisational behaviour.

Organisations are posited to passively succumb to institutional coercive and normative pressures in order to obtain the social support of stakeholders (for example, their adherence to regulations designed for environmental protection or to requirements demanded by professional organisations) (Fernández-Alles and Valle-Cabrera 2006, p.503). Institutional theory can therefore be used in relation to an organisation’s social licence to operate. It could help in establishing what is expected by external parties – something which is often unclear and hard to disseminate.

Institutional theory highlights that there are numerous orders or levels of institutions, each with their own forces at play (Hoffman 1999). Institutional orders range anywhere from the individual level to societies as a whole (Thornton & Ocasio 2008). Examples of institutional orders in the organisational context would be the individual, the department they belong to, the operation they are involved in, the corporation they are a part of and finally, the industry their corporation is a member of (see Figure 7).
By division of an institution into different orders highlights the importance of internal actors. They have the ability to act and respond differently within the same institution. In other words, the internal actors possess some power and ability to change things in the institution (Thornton & Ocasio 2008). This also makes it clear that there may be different institutional forces at play at different institutional orders as the internal actors in the institution have the power to impact the other institutional orders around them (Greenwood et al. 2008). In other words, each institutional order within an institution can be influenced by different forces. Not only can each of the institutional orders be influenced by different forces, but the way in which each order responds to forces may also be different (Tolbert & Zucker 1999). This brings us to the concept of institutional logic.

Institutional logic suggests that the levels of an institution may respond differently to the institutional forces depending on the logic that is at work at that level (Thornton & Ocasio 2008). Institutional logics are instantiated in and carried out by individuals in their actions, tools and technologies. Some actions reinforce existing conventions, while others reframe or alter them (Greenwood et al. 2008). Understanding the institutional logic at a particular institutional order can explain how and why there is a certain response to an institutional force. Understanding the logic can also help to predict how members of an institutional order may respond to future institutional pressures (Thornton & Ocasio 2008).

Institutional theory goes a long way to explaining why organisations change due to pressures which are not obvious and measurable. It also provides explanations for why organisations do things that they are not necessarily required to do by legislation or shareholders, which is often the case in
environmental management. In fact, institutional theory has been used to describe numerous environmental management topics. This is discussed later in this chapter.

**Internal drivers for change**

At an internal level, drivers of change include the structural, cultural and political environments in which ideas and action for change operate (Ashurst & Hodges 2010, p.225). This is in addition the pressures stemming from things such as organisational growth, mergers/acquisitions and new management (Palmer et al. 2006). Wood et al. (2006) add that triggers for internal change include changes of products and services offered by the organisation, as well as changes to processes and measures of effectiveness.

2.3.3 Determining change factors

As discussed earlier in this chapter, for a change management initiative to be effective, there needs to be comprehensive prior planning (Allen et al. 2007; Dunphy & Stace 1993; Gill 2002; Graetz & Smith 2010; Hughes 2007). An assessment of the current situation in the level at which the change is to take place is essential in order to determine exactly what needs to be managed so that the effort is successful (Lewin 1997). One way of conducting this assessment is to utilise the force field analysis tool.

**Force field analysis**

For any internal organisational change, there are forces working for the change and forces working against it (Lewin 1951). Kurt Lewin called forces driving forces and restraining forces. He suggested that organisations were systems held in equilibrium by forces working in opposite directions. The force field analysis concept has its foundations in a combination of three aspects of Lewin’s work: field theory, group dynamics and the three-step change model. Force field analysis is still widely used as a tool to inform decision-making in change management (Champion 2010; Swanson & Creed 2013). It is a powerful method for gaining a comprehensive overview of the different forces acting on a situation and for assessing the source and strength of these (Champion 2010; Schwering 2003). According to Lewin, in any social situation, opposing forces are at work (Lan & Lee 1996). In order for change to occur, the driving forces must be stronger than the restraining forces (Lewin 1997). Figure 8 illustrates all of the aspects in a force field analysis.
All approaches to bringing about change must address a key issue inherent in organisations: why they are stable and resistant to change. Understanding how to change organisations starts with understanding the conditions that perpetuate the status quo (Cummings 2004). The goal of force field analysis is to help leaders and other stakeholders identify, document, and understand those forces likely to influence plan implementation. Based on this understanding, leaders can act to leverage helping forces and mitigate hindering forces (Schwering 2003, p.362).

In Lewin’s model, change from the status quo to a desired state can be induced by increasing the driving forces or by reducing the restraining forces (Lewin 1997). Each approach has markedly different outcomes however. Organisation changes that result from increases in driving forces are likely to be accompanied by relatively high levels of tension as restraining forces rise to push back against the changes. Such tension can lead to increased aggression and emotionality, and lower levels of commitment to change. The more effective change strategy is to reduce restraining forces, and thus let driving forces promote change while facing less resistance. This low-pressure method results in greater acceptance of the changes and more positive reactions to them (Cummings 2004, p.33).

Force field analysis is intrinsically linked to Lewin’s Field Theory and his three-step planned change model. It considers what forces are in the field in the current situation (what has to be unfrozen), what has to be managed, an appropriate plan for achieving a desired outcome (moving), and what forces need to be in place to prevent the situation reverting to the status quo (refreezing). It is essentially a planning tool that should be adopted prior to implanting a change management plan.

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**Figure 8: Force field analysis diagram**

![Force Field Analysis Diagram]
The literature suggests that there are numerous ways of conducting a force field analysis. Authors outline methods for conducting an analysis with anywhere from three to six steps. Schwering (2003, p.364) offers a comprehensive six-step method comprising the following steps:

1. Convene the planning task force and define the problem and general goal.
2. Characterise the ideal situation.
3. Characterise the present situation.
4. Concisely summarise the gap between the ideal and the actual.
5. List and discuss the helping and hindering forces accounting for the status quo.
6. Action planning.

Although force field analysis has stood the test of time (in that it is still implemented in organisational management today), it has not gone without criticism (Burnes 2004a; Swanson & Creed 2013). The technique has been considered as highly dependent upon the planner’s experience, cognitive style, personality and resulting mental models (Schwering 2003, p.362).

### 2.3.4 Change Leadership

Nearly three quarters of change initiatives in the workplace fail (Ashurst & Hodges 2010). Therefore, change efforts need to be carefully thought out and implemented. By far the most common recurring theme in the literature on how to successfully introduce change in an organisation is leadership. According to Wood et al. (2006, p.492), leadership involves preparing people for the change by challenging the status quo and communicating a vision of what the organisation can aspire to become. It then involves building the commitment of employees and change agents throughout the organisation, and enabling them to act by providing resources and training, delegating power, building change teams and putting appropriate systems and structures in place.

Effective leadership requires managers to harness political power and take action (Sheard et al. 2011). Politics and influence are the processes, actions and behaviours through which power is used and realised (Wood et al. 2006). Workplace leaders must understand the relationship between their position, power, influence and politics prior to attempting to implement change (Burns 2000). They must also be good decision-makers as they are the ones who set the direction of change (Heifetz & Linsky 2004).

Good leaders then maintain the momentum of change through actions that reward progress and recognise the reaching of milestones (Wood et al. 2006, p.492). Effective leaders also coach their fellow employees during the implementation of organisational change and their coaching skills can be
measured by the extent to which employees internalise the organisation’s goals and identify with the values espoused by the organisation (Grant 2010).

A lack of effective leadership can lead to a gap between what is planned for an organisation and what actually occurs (Gill 2002). In other words, goals and targets can be set by a company, but without effective leadership, they are unlikely ever to be achieved. Espoused theory can also be used to explain why there is a gap between what is intended and what actually happens in an organisation.

**Espoused theories and theories-in-use**

Espoused theories and theories-in-use can be used to explain why there is a difference between what is aimed for (i.e. policy) and what actually occurs (McLaren 2011). Espoused theories represent what an organisation plans to do in a certain situation, whereas, theories-in-use represent how they actually go about effecting change (Argyris & Schon 1974). The theories are based on conscious and unconscious reasoning processes in relation to human behaviour, and the concept of ideal self versus actual self (Anderson 1997). Argyris and Schon (1974) assert that people hold maps in their heads about how to plan, implement and review their actions. However, they believe that few people are aware that the maps they use to take action are not the theories they explicitly espouse (Anderson 1997).

It should be noted that they are not simply talking about a difference between what people say and do. They are not referring to the difference between theory and action, but rather to the difference between two theories of action (Anderson 1997). To that end, an espoused theory can be seen as the world view and values people believe their behaviour is based on, and theory-in-use can be described as the world view and values implied by their behaviour, or the maps they use to take action (Argyris et al. 1985, p.82).

Argyris (1987, p.93) uses the following example to clarify the distinction between the two:

> When asked about how he would deal with a disagreement with a client, a management consultant responded that he would first state his understanding of the disagreement, then negotiate what kind of data he and the client could agree would resolve it. This represents his espoused theory (or the theory behind what he says) which is of joint control of the problem. A tape recording of the consultant in such a situation however, revealed that he actually advocated his own point of view and dismissed the client’s. This indicated his theory-in-use (or the theory behind what he did), which more closely approximates his unilateral control of the problem and a rejection of valid information exchange.
The difference between the planned actions and thoughts behind the actual actions undertaken in a situation are often unintended and even subconscious (Anderson 1997). The fact that there is even a difference between the two may also go unnoticed unless there is a review of the situation (Argyris 1998). The problem is that when people or organisations are acting in an unplanned manner, they may be causing unintended consequences (Anderson 1997).

Negative consequences of organisations not acting in accordance with their policies or plans include not meeting their desired targets (Kabanoff et al. 1995). In this case, they would be considered to be underperforming because they would not be meeting set targets. Another example, and this is especially relevant for environmental management in mining, the unplanned actions may have detrimental impacts to the business, surrounding communities, stakeholders or the environment (Bice 2013).

For example, a mining operation could believe that in a flood event, they would manage all of their mine-affected water so that offsite releases could be prevented, and no harm would be done to the downstream environment and community. However, if a flood actually did occur, they could adopt a very different thought process about how and why the water should be managed. At the time of the flood, their priority could be to protect the production capability of the mine, and therefore, they would release as much water offsite as possible so that production would not be interrupted by the flood. Such a scenario would have dire consequences on the environment and community.

Another issue that can be caused by the misalignment of planning and practice in organisations can be the loss of support from employees (Kabanoff et al. 1995). If promises by company leaders are not honoured, it can distract and disengage employees. This is in addition to affecting the perceived levels of integrity of organisational leaders (McLaren 2011, p.iv). This goes to show that misalignments in policy and practice can occur at any level in an organisation, from the individual to departments and even in different companies within the same organisation (Fisher 2000). Misalignments can also occur between espoused organisational values and the values of the people working for an organisation (Kabanoff & Daly 2002). Espoused values could be described as concepts or beliefs pertaining to desirable end states or behaviours (Oncer 2013). If the desired values are not shared throughout an organisation, undesirable workforce behaviours may result. As a result, the organisation will not be acting as planned.

If an organisation wants to determine whether it is acting in accordance with its plans, it can undertake a critical self-reflection. A critical reflection is a process by which the assumptions governing actions can be identified and changed, and alternative behaviours developed (Savaya & Gardner 2012, p.145). In
other words, organisations can do a check on themselves to establish whether they are acting as they had planned and if not, they can rectify their behaviour. Undertaking such a review is a part of good leadership. Leadership often involves challenging people to live up to their words, to close the gap between their espoused values and their actual behaviour. It may mean pointing out the unspoken issue that everyone sees but no one wants to mention (Heifetz & Linsky 2004, p.33).

Espoused theories and theories-in-use have been applied to corporate social responsibility and environmental management in the past. Environmental management across numerous industries in the United States was investigated for disparities between public commitment and internal behaviour in 2002 (Callaghan 2002). In more recent times, corporate social responsibility in the Australian mining industry as a whole has been analysed to identify any gaps between policy and practice in the areas of community engagement and the management of labour (Bice 2013; Jones et al. 2007). All of these studies have found large differences between espoused and actual behaviours.

**Organisational Behaviour**

Another aspect of leadership is the requirement to manage organisational behaviour. Organisational behaviour can be defined as the human behaviour which occurs in organisational settings, the interface between human behaviour and the organisation and how organisations as a whole interact with broader social systems (Griffin & Moorhead 2011). The field of organisational behaviour is an entire management discipline in itself which arose in the 1940s and there is extensive literature on the topic (Rollinson 2008). The ultimate goals of the field are to help people and organisations achieve desired performance levels and to help ensure organisation members achieve satisfaction from their work experiences (Lawrence et al. 1967). It helps workplace leaders to understand the individual attributes of the people they have working for them, including their motivations and what is likely to impact their job performance (Wood et al. 2006).

Organisational behaviour is complex, with many different factors needing to be considered in order to achieve organisational effectiveness (Griffin & Moorhead 2011). These include, but are not limited to, organisational structure, organisational culture, power, politics and influence, group dynamics and leadership (Wood et al. 2006). The field also acknowledges that organisations and the people in them are affected by the relationships and interactions between individual processes, interpersonal processes and organisational processes (Griffin & Moorhead 2011).

Despite the broad range of variables taken into consideration in organisational behaviour, the field has often been criticised the in the past for being too micro-focussed in the organisational context (Fisher
What has been missing, according to some critics, is the consideration of effects of the multi-levels within organisations (DeChurch et al. 2010; Fisher 2000; Salvato & Rerup 2011). Similar criticisms have been made for macro-oriented fields such as organisational development, industrial sociology and organisation theory in which organisations are seen as collective, recurrent entities or ‘black boxes’ and the complexities of micro-issues are underappreciated (Salvato & Rerup 2011).

Management scholars are now realising that multi-level phenomena within organisations have an impact on organisational effectiveness and therefore need to be taken into account when considering organisational initiatives (Fisher 2000). Levels within organisations are not necessarily hierarchal. There can also be functional levels, capability levels and levels within networks (Salvato & Rerup 2011). Intertwined with the emerging need for more understanding of the differing levels within organisations is the need for multi-level leadership.

According to DeChurch (2010), organisational effectiveness hinges on coordinated leadership being enacted by leaders residing within multiple hierarchical levels, whose leadership shapes crucial individual-, team-, unit- and organisational-level outcomes. When put into the context of environmental management, it is apparent that not only must the different levels within organisations be considered, but the leadership across the levels of policy and practice also need to align.

### 2.3.5 Change management in mining

The mining industry is subject to significant and continual change (Trist 1989). Mining organisations operate with a finite resource, often in remote locations. They require specialised skills, with high capital intensity and are likely to encounter political, social and environmental global problems. Mining is among the most technologically advanced of all heavy industries but it relies on employees and contractors for operational success (Dickie & Dwyer 2011, p.329). Hence they need effective organisational change management.

Mining companies have many drivers for change. Mining operations are large scale and impact large areas and communities (Hilson & Nayee 2002). They employ large numbers of people and have many different stakeholders, including shareholders, customers, suppliers, employees and regulators (Cragg & Greenbaum 2002). Because of their large scale, they also attract a lot of attention from non-government organisations and the media (Imbun 2007). With so many interested parties come scores of demands and requirements for change.

The need for widespread, varied and constant change brings with it many organisational issues which need to be overcome in order for mining organisations to be able to operate effectively, legally and
profitably. One example is the frequent changes to organisational targets which occur when companies are required to change due to external pressures (Hamann 2004). More pertinently, mining organisations need to ensure everyone within the organisation is aware of, and is striving to meet, the new targets (Bice 2013).

Another well-documented issue for change management in the mining industry is the resistance caused by unions (Zheng et al. 2007). Mining organisations are often highly unionised and unions therefore hold great power over whether changes will be supported or rejected (Jones et al. 2007). Often mining organisations need to alter their proposed policies numerous times, after much consultation with the unions, before they can be implemented (Zheng et al. 2007).

Mining is inherently a boom or bust industry, which in itself drives a continual cycle of change (Black et al. 2005). Workforce numbers are constantly (and usually rapidly) increasing or decreasing. A particular issue associated with regularly changing workforces is employee retention and retention of business knowledge (Dickie & Dwyer 2011). In addition to these human resource issues, the industry has a difficult time attracting and retaining women (Solomon et al. 2008; Smith et al. 1993). With this comes the difficult task of being able to align employees with business strategy.

A common approach to aligning workforces with organisational strategy is the adoption of strategic resource management plans (Dickie & Dwyer 2011; Jones et al. 2007; Zheng et al. 2007). A strategic resource management plan is defined as the ‘pattern of planned human resource deployments and activities intended to enable an organisation to achieve its goals’ (De Cieri & Kramar 2005, p.49). The fundamental aim of any strategic human resource management plan is to streamline the organisation, its strategy and its culture (Zheng et al. 2007).

According to Nankervis et al. (2008), it is imperative that strategic human resource management systems and plans be responsive to an organisation’s external environment. Organisations need to be on the lookout for emerging issues which have the potential to bring with them a need for change. If organisations fail to do this, they will quickly become out dated and ineffective. In addition, strategic human resource management systems need to be supported by human resource professionals with specific skills (Dickie & Dwyer 2011). They include traditional human resource functional content (staffing, compensation etc.), change management or leadership skills and business skills (the ability to understand business language and function effectively) (Uysal 2008, p.1).

In terms of corporate social responsibility, mining organisations need to be able to align corporate strategy with the localised demands of communities surrounding their operations (Bice 2013). As most mining companies tend to have numerous mines and in widespread locations, each operation is often
subject to unique pressures and challenges (Kemp 2010). Corporate policies cannot cater for every local issue of every operation and therefore implementation of corporate-level changes can be difficult at some mines (Bice 2013).

There has also been some difficulty in the industry in the implementation of corporate social responsibility initiatives in regards to bringing about systemic change in the management of labour. At Rio Tinto and BHP, where such initiatives have been incorporated into enterprise agreements or employment contracts, they have not brought about changes in the way employees operate (Jones et al. 2007). This indicates that more effective change management initiatives need to be adopted.

When put into the context of environmental management in the Australian coal mining industry, the change management literature highlights the need for environmental objectives to be included in strategic human resource management plans in order for them to be achieved. In addition, the plans need to be responsive to the needs of the external environment/stakeholders who influence environmental management (Benn & Dunphy 2004).

2.4 Environmental Management and Change Management Literature

2.4.1 Environmental management and institutional theory

In this study, institutional theory has been considered in terms of institutional forces being possible driving and restraining forces for environmental management. Institutional theory has been used in numerous studies as a way of determining the forces which influence how the environment is managed by corporations. In 1995, Jennings and Zandbergen were amongst the first to use the theory as a way of explaining firms’ adoption of environmental practices. They found that coercive forces (primarily regulation) were the reason behind why companies implemented environmental practices which were similar to those of other companies (Delmas & Toffel 2004).

In 1999, Hoffman investigated environmentalism in the United States chemical industry. In the paper (which is still commonly referred to), institutional theory was utilised as a framework in which to explain the rise of environmental management around central issues and events. Hoffman concluded that environmental problems must be solved through changes in the institutional arrangements that govern industry and social action (Hoffman 1999, p.367). The theory was also used by Delmas and Toffel (2004) to determine the drivers of ISO14001 environmental management system adoption in the United States and Europe. They described how cognitive, normative and regulative forces within a country impact the way organisations adopt environmental management systems (Delmas & Toffel 2004).
Institutional theory has also been used to explain why organisations go above and beyond their legal compliance requirements in environmental management. For example, Liu et al. (2010) observed organisations in China who had proactively/voluntarily introduced environmental management initiatives. It seems the theory goes some way in explaining the reasons why organisations do things that they are not coerced into doing. It brings to light that there are in fact forces in play which direct how things are to be managed in an organisation, even though the forces may not be clear or easy to pinpoint. The theory is, therefore, apt for explaining why organisations undertake corporate social responsibility initiatives.

Matten and Moon (2008) discuss institutional theory in a similar way in relation to corporate social responsibility. They state that there are two approaches to corporate social responsibility – implicit and explicit. Implicit approaches are adopted by organisations that respond to coercive forces. Explicit approaches, on the other hand, are voluntary and are implemented as a result of deliberate and often strategic decisions made by the corporation. Institutional theory has also been applied to corporate social responsibility in the context of mining in developing countries. Gifford et al. (2010) adopted the theory as a way of explaining why multinational gold mining corporations execute corporate social responsibility initiatives when there is no mandatory requirement to do so. They found that organisations who contribute to community development actually become more competitive due to the new institutional norms that have been created. Corporate governance is another area in which institutional theory has been used by researchers. Delmas and Toffel (2004), along with Brammer et al. (2012), explain how governance for environmental management and corporate social responsibility extends well outside an operation’s corporate structure. They use institutional theory as a means of highlighting the potential power that external stakeholders have for driving change within an organisation.

2.4.2 Known drivers and barriers for environmental management

**Environmental management drivers**

Zutshi and Sohal (2004) divide external environmental management drivers into four categories – market drivers, social drivers, financial drivers and regulatory drivers (refer to Figure 9). All of these drivers are thought to have the potential to impact the way the environment is managed in operations. They set the direction in which organisations move by expressing needs, wants and demands.
Studies indicate that while a variety of factors positively influence environmental management, regulatory pressures are among the most important (Jones, 2010, p. 1229). In fact, regulation is considered to be the most influential driver in environmental management (Sindhi and Kumar 2012). This is not surprising given that non-compliance has the ability to shut operations down and without operations, there is also no profit.

What is perhaps less clear cut is from where the drive for particular regulations comes. It is inconceivable that state bodies would create regulations without attempting to appease at least some societal members (refer to Figure 9) (Zutshi & Sohal 2004, p.337). Without a doubt, the actions of internationally mobilised human rights and environmental activists, and international agreements concerning environmental protection and environmental justice, are drivers of regulation (Benn et al. 2006).

Authors such as Brammer et al. (2012) and Prno and Slocombe (2012) have recognised that the governance of organisations who have the ability to negatively impact the environment, extends well outside the organisation itself. The strength or power of the governance actors affects their ability to drive change (Benn et al. 2009). The amount of power each external stakeholder has, however, is not so clear or easy to measure (Rowley & Moldoveanu 2003). Some drivers may be very obvious and tangible. Others, may not be. In relation to institutional theory, coercive or regulatory pressures are quite often clearly stated, whereas normative and cognitive pressures may not be. In the mining industry, two such drivers in particular are well documented – social licence to operate and reputation (Jones et al. 2007; Prno & Slocombe 2012).
Mining organisations act in accordance with their social licence to operate because this keeps them in operation (Gunningham et al. 2004). They act to protect their reputation because a loss in reputation can lead to a loss in profit. BHP learnt this lesson the hard way in 1998 when they became involved in the disastrous Ok Tedi mine in Papua New Guinea. Their image in the media went from a ‘commercial success’ to an ‘environmental and social enemy’ and as a result, their share price dropped from $20 to $12 in a very short period of time (Hanson & Stuart 2001).

Known drivers for environmental management are not only external. Managers and employees also have the ability to drive change towards a more sustainable organisation (Sindhi & Kumar 2012). Depending on personal values (which shape attitudes), managers and other champions within a firm have the power to influence the direction and degree to which environmental initiatives are introduced (Bansal 2003). These are evident in the types of voluntary environmental management targets set by the company.

**Environmental management barriers**

Known external barriers to environmental management include pressure from competitors, lack of knowledge about impacts on and from suppliers and customers, lack of interest from consumers and investors, and regulation (Lozano 2012). Regulation is regarded as the most influential factor in corporate environmentalism (Sindhi & Kumar 2012). It is not only a major driver for environmental management, it can also become a barrier to improvement (Garrod 1997).

Doppelt (2010, p.70) highlights the point that regulation is indeed a ‘licence to harm’. He states that being in compliance simply means ‘being as bad as the law allows’. The regulatory system sets a bottom line for a limited number of the more obvious, egregious environmental and social (mostly public health related) impacts that are generated by the inherently damaging take-make-waste economic system. It was not designed to support a shift to a circular borrow-use-return approach. Thus it is not intended, and is ill suited, to steering organisations toward sustainability (Doppelt 2010, p.69).

Confusion around what sustainability is and what sustainable practices are can prevent organisations from improving their environmental performance (Jain 2005). If organisations do not know what good practice looks like, they will not know how to achieve it. To date, there is much confusion for organisations and their stakeholders around what organisational sustainability is, and this could be preventing companies from improving their practices (Bell & Morse 2008; Husser et al. 2012).

Internally, barriers to environmental management change can occur on numerous levels – individual, group and organisational (Lozano 2012). Barriers at the individual level include such things as lack of trust, and misunderstandings about what is expected (or why). At the group level, cultural differences
and conflicts between groups can be barriers and at the organisational level, lack of strategy or bureaucracy can be issues (Lozano 2012).

A lack of top management commitment at the organisational level is also evident (Papagiannakis & Lioukas 2012). As discussed in the change management section of this chapter, leadership is vital in creating change. If the values, attitudes and perceptions of managers do not align with the desire to reduce environmental harm, there will be some form or resistance to any pro-environmental management initiative (Papagiannakis & Lioukas 2012).

Another environmental management barrier related to leadership is propensity for a short-term focus (Husser et al. 2012). Sustainability requires a long term focus which is often overlooked in business where deadlines and budgets are rarely longer than two years. The health of the environment lacks deadlines, urgency, and measurable objectives and, as such, does not compete well with other organisational priorities (Husser et al. 2012).

The costs of environmental management initiatives are often a cause for their rejection and therefore they act as a barrier to change (Zutshi & Sohal 2004). Businesses need profit to operate and spending is always under tight scrutiny. Some environmental projects have the added benefit of making the organisation more efficient or even saving the organisation money. In these cases, the chance of rejection is much less.

Doppelt (2003, p.2) identifies seven common errors which occur when organisations attempt to introduce environmental/sustainability initiatives:

1. Patriarchal thinking which leads to a false sense of security – this is where employees only do what management orders and management strictly follows government mandates. Employees and the organisation as a whole rarely go beyond the requirements of their ‘superiors’.
2. A silo approach to environmental issues – executives see the environment as yet another special program and do not understand how it affects design, purchasing, production and other units.
3. No clear vision of sustainability or environmental management targets – this creates uncertainty about what they are trying to achieve. Without a clear vision, firms often assume that being in compliance with the law is the sole purpose of their policies.
4. Confusion over cause and effect in environmental issues – this leads organisations to focus on symptoms of environmental problems rather than sources. For example, organisations often attempt to manage their emissions (which come at the end of the process) rather than address the causes of the emissions.
5. Lack of information – a lack of communication as to why the company is undertaking environmental management tasks. This results in a lack of information about the need for the initiatives.

6. Insufficient mechanisms for learning – where employees are given limited opportunities to test new ideas and if they do, they receive few rewards for doing so. This restricts innovation and prevents workers from continually testing new ideas, expanding their knowledge base and learning how to overcome barriers to change. It also reduces the number of internal improvements in the organisation.

7. Failure to institutionalise sustainability or good environmental practices – sustainability-based thinking, perspectives and behaviours are not embedded in everyday operating procedures, policies, bonuses, new hiring and culture.

Kemp et al. (2010) also highlight the seventh common sustainability blunder as stated above. They state that for corporate social responsibility initiatives to be successful, there needs to be shared understanding amongst employees that those initiatives are important for the organisation. If there is no such shared understanding within the organisation in regards to environmental management, there will be great resistance to any attempts to improve it.

There has been much debate over the years about how effective ISO14001 environmental management systems are in improving performance. There is even evidence to suggest that companies with ISO14001 certification are less committed to activities designed to protect the environment (Harwood et al. 2011). The issue is that ISO14001 certification sets a standard for environmental management systems, not for performance (Krut & Gleckman 1998). Adding to the ineffectiveness of environmental management systems is the distinct lack of attention to change management processes when introducing the systems (Ronnenberg et al. 2011). Without this, it does not matter how effective the system could be, it will be underutilised because the workforce will not understand what it is, how it works or why it is being implemented.

It has been said that environmental management systems have also led to risk-based and audit cultures in the mining industry (Kemp et al. 2010). Environmental management systems direct environmental focus onto areas that are perceived as a risk to the business (i.e. loss of production or reputation), rather than risk to the environment (or community). This approach undermines the fundamental aim of corporate social responsibility (Kemp et al. 2010).

The current audit culture present in mining companies is also considered to be negatively impacting environmental management in regards to accountability and performance restrictions. Accountability
for environmental issues tends to be considered to lie solely with those involved in the audits, rather than all employees at a site (Kemp et al. 2012). This is an issue because if people are not held accountable for their actions, they are less likely to want to manage the environment in accordance with site policies and procedures. This also inhibits cultural change.

The environmental performance levels of sites are seen to be limited by the audit culture in that audits only assess for compliance against specific guidelines. A ‘clean’ audit report with little to no non-compliances is considered good environmental performance and so this tends to be the target for mining companies (Kemp et al. 2012). There is no capacity in audits to recognise performance above and beyond compliance, and therefore, there is little incentive for companies to aim for more.

Environmental management systems are also regarded as an inhibiting factor in community engagement. The systems are considered to be closed within organisations which means that they do not promote engagement with external parties or welcome input from communities (Kemp 2010). As a large requirement for an organisation to become sustainable is to have input from their local communities (Benn & Dunphy 2005), current environmental management systems are not helping mining organisations.

By viewing the information provided in sustainability reports released by mining companies, it is evident that there is no standard approach to measuring environmental performance (Jenkins & Yakovleva 2006). Different companies state different key performance indicators as a way of suggesting that they are performing well. This can no doubt be attributed to the voluntary nature of corporate social responsibility and the fact that the companies themselves select what information they choose to disclose (Jenkins and Yakovleva 2006). This highlights the fact that there is no clear environmental performance benchmark for mining companies to aim towards. The vast array of key performance indicators presented by companies also makes it difficult for stakeholders to understand what good performance looks like and therefore what they should expect from companies.

Another factor limiting environmental performance in the mining industry are the legislative requirements placed on operations by the regulating bodies. In the Australian mining industry, for example, operations are issued with environmental licences which outline specific impact limits that sites must not exceed. Limits can pertain to water quality, noise and dust emissions, rehabilitation criteria and other factors. The problem with setting such limits is that they are not conducive to continual improvement. The limits themselves essentially become the environmental performance targets as there is no incentive to go above and beyond them (Coglianese et al. 2002; Doppelt 2010).
2.5 Areas requiring further investigation

Although there is publicly available information on what coal mining companies in Australia are aiming for with respect to their environmental management (such as public reports, policies and websites), there appear to have been no studies which collate all of this information. Similarly, no investigations could be found which examine whether organisations are aiming for these same targets internally. Perhaps more importantly, research on how the industry is performing on the whole in regards to environmental sustainability is lacking. This raises two questions: 1. What is the industry aiming to achieve in regards to environmental sustainability? and 2. In practice, are mining organisations aiming to achieve the same thing? These queries are the basis of the first two research questions in this study.

Critical reflection of how environmental policy and practice align in the industry is required (there have been some studies of this nature undertaken on the mining industry as a whole, however, none have focused on the coal industry specifically). Without this type of information, it is difficult for the industry to gauge how it is tracking against its environmental targets and whether it needs to improve. Additionally, it is not easy for organisations within the industry to understand what the benchmark for environmental performance is and how they compare with it. On a global scale, it is difficult to know how the industry compares with other countries and industries. This gap in the literature highlights the need for investigation into what is happening in practice in the area of environmental sustainability in coal mining organisations. How are organisations actually performing? What are the types of things helping them to improve their performance? What are the types of things hindering their performance? Questions 3-5 address these issues.

There is also no clear information on exactly how the coal mining industry in Australia should move forward to improve its environmental management as a whole. There is literature on how organisations in general can become more sustainable and there are many scientific reports on how to improve individual facets of environmental management (such as water management or air pollution), but information is lacking which specifically relates to coal mining companies in Australia. There is a gap in the literature which takes into account the specific issues facing the industry (such as its regulatory framework, etc.). This highlights the need for another research question: What would need to change in the industry to reach the overarching environmental sustainability goal?

In essence, the literature does not make reference to an all-in-one tool which enables organisations to see what the possible different levels of environmental sustainability are (i.e. a tool in which the attributes of each level of sustainability are well defined), and then select what to aim for, how to assess their current performance standards against that target and then obtain company-specific
guidance on how they can achieve their goals. When combined with sustainability parameters, the force field analysis tool can do all of these things. A search of the literature also failed to locate evidence of the use of force field analysis in the context of environmental management. Force field analysis informed the research method in this study due to its ability to address the gaps in the literature mentioned above. It provided the framework to thoroughly investigate the research problem. In fact, the research questions themselves are based on standard force field analysis steps (as discussed in Chapter 3).

Force field analysis is still often used within organisations for planned change management initiatives (Champion 2010). However, there appear to be no studies documenting its use on larger scales such as the industry or institutional level. Given that the applicability of Lewin’s field was never intended to be restricted in size, the author fails to see why force field analysis should only be used within organisations and not at a larger scale. The forces that Lewin discussed are present for any group, irrespective of its size or institutional order. The ways in which Lewin perceived change to occur is relevant for any social structure (Lewin 1997).

This highlights another gap in the literature – the combination of force field analysis and institutional theory. Historically, force field analysis has concentrated on the small-scale types of forces present in the workplace rather than the wider institutional forces which also have the potential to impact organisations. Although this study is not solely focussed on the institutional forces influencing environmental management, it does take them into consideration and encompass them.

Institutional theory has been applied to environmental management in the past. However a comparison of the different forces present at each institutional level from the department level to the industry level has apparently not. Fisher (2000) and Salvato and Rerup (2011) argue the clear need for more multi-level research to be undertaken so that more knowledge can be gained on the complex inner workings of organisations. This study therefore takes into account the potential differences of each institutional order by comparing responses to the research questions at the individual, department, operation, corporation and industry levels.

The author was also unable to find examples in which institutional logic had been applied to environmental management. As this logic could be a major driving or restraining force for the industry, the author thought it imperative that it was considered as part of the study. It was believed that an understanding of institutional logic could allow it to be managed as part of the action plan for helping the industry to become more sustainable. To this end, another research question was raised: What is the institutional logic for environmental management in the industry?
2.6 Theoretical framework

The theoretical framework for the research combines Lewin’s field theory and force field analysis, institutional theory, institutional logic, espoused theory and Dunphy et al.’s (2003) sustainability Phase Model. They provide the foundation from which to build knowledge on the research problem. Figure 10 depicts how all of the aforementioned theories combine to form a basis for investigating the research aim and subsequent research questions.

![Theoretical framework for the study](image)

Figure 10: Theoretical framework for the study

In the framework, espoused theory is employed to investigate what is planned (policy) for mining organisations in regards to environmental sustainability. This is what the organisations say they are aiming to achieve. This aspect of the framework relates to the first research question which is: What is the planned (policy) overarching environmental sustainability goal for the industry?

Field theory and force field analysis are used to establish what is happening in practice in mining organisations. They determine what organisations are actually aiming for in environmental sustainability, how they are currently performing against that goal, what forces are helping and hindering them in their efforts, and what actions need to be taken to achieve their desired target. This aspect of the framework pertains to Research Questions 2-6.

Institutional theory and institutional logic are also employed to help understand what is happening in practice in organisations. Institutional theory highlights that there are many different levels within organisations/institutions and that each level may be privy to different influences. The study therefore
investigates what is happening in practice at five different institutional orders – individual, department, mine site, corporate and industry.

The types of institutional forces present are investigated in terms of which institutional forces are helping and hindering environmental management efforts at each of the institutional orders. Institutional logic is utilised to gain an understanding of the thought processes behind why the environment is managed the way it is in organisations. The logic itself can act as a driving or restraining force for improving environmental sustainability.

The Dunphy et al. (2003) sustainability Phase Model is used to as a means of measuring differing levels of organisational sustainability. As discussed previously, there are six different levels in total and all mining organisations in the industry are considered to be performing somewhere within that range. The scale also acts as a basis for identifying what level of environmental sustainability particular organisations are espousing to achieve.

2.7 Summary

This chapter presented the current literature that is relevant to the research aim in the fields of environmental management and change management. It identified gaps in existing knowledge which require further investigation, and in doing so, established where this study could add value. Seven research questions were developed in total as a means of adequately addressing the research aim. A suitable theoretical framework to underpin the research was also developed following a review of the literature.

The literature revealed that coal mining companies in Australia are publicly stating their desires to operate sustainably and reduce their environmental footprint as much as possible. However, whether this is what they are aiming for, or achieving in practice, is uncertain. Also unclear are the types of factors impacting their ability to achieve their aim. The change management literature provided insight into how the research aim could be investigated. Force field analysis, a planned change management tool, was found to provide a suitable methodological framework for investigating the research problem and associated gaps in the literature. Force field analysis informed the research method in this study, as is discussed in more detail in the next chapter.
Chapter 3   Methods

3.1 Introduction

This chapter outlines the methods and methodology adopted for the research. It explains the paradigm that informs the research, the rationale for the adoption of particular research strategies and a detailed description of the methods used to investigate the research questions. A summary of the pilot study, which was undertaken to determine the most effective data collection method for the research, is also discussed in this chapter. The chapter then concludes with a discussion of the limitations and ethical considerations of the research. An outline of the chapter is shown in Figure 11.

The research was conducted in three phases. The first phase consisted of a document review/analysis of company website material. The second phase was an online qualitative questionnaire and the third was a series of in-depth interviews. A detailed description of the processes undertaken in each phase is provided in the research design section of this chapter.
3.1.1 Research questions and data collection methods

The following research objectives were investigated as a means of determining some conclusions about the study aim which was to determine whether environmental sustainability policy and practice align and what needs to change to bring them into alignment. Table 3 outlines the research questions and the data collection method for each.

Table 3: Research phases of the study

<table>
<thead>
<tr>
<th>Research question</th>
<th>Phase</th>
<th>Pertaining to</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the planned overarching environmental sustainability goal (or policy) for the industry?</td>
<td>1</td>
<td>Espoused organisational environmental sustainability</td>
<td>Document review</td>
</tr>
<tr>
<td>In practice, what is the overarching environmental sustainability goal for the industry?</td>
<td>2</td>
<td>In-practice organisational environmental sustainability</td>
<td>Online qualitative questionnaire</td>
</tr>
<tr>
<td>What is the current level of environmental performance in the industry?</td>
<td>2</td>
<td>In-practice organisational environmental sustainability</td>
<td>Online qualitative questionnaire</td>
</tr>
<tr>
<td>What are the drivers (internal and external) for achieving the environmental sustainability goal in the industry?</td>
<td>2</td>
<td>In-practice organisational environmental sustainability</td>
<td>Online qualitative questionnaire</td>
</tr>
<tr>
<td>What are the restraining forces (internal and external) impacting environmental sustainability goal attainment in the industry?</td>
<td>2</td>
<td>In-practice organisational environmental sustainability</td>
<td>Online qualitative questionnaire</td>
</tr>
<tr>
<td>What is the institutional logic for environmental management in the industry?</td>
<td>2</td>
<td>In-practice organisational environmental sustainability</td>
<td>Online qualitative questionnaire</td>
</tr>
<tr>
<td>What would need to happen in the industry for it to reach the overarching environmental sustainability goal?</td>
<td>3</td>
<td>How to align espoused and in-practice organisational sustainability</td>
<td>In-depth interviews</td>
</tr>
</tbody>
</table>
3.2 Research Paradigm

A paradigm is the basic belief system or set of concepts and assumptions which orientates thinking and research (Neuman 2006). Guba and Lincoln (1994) outline four principal research paradigms – positivism, constructivism, critical theory and realism. Simply put, people of the positivist orientation conduct value free research to find causal laws, facts and universal truths. Constructivists research with the assumption that the beliefs and meaning people create and use fundamentally shape what reality is for them (i.e. there is no single reality). Critical theorists conduct research that emphasises combating surface level distortions, multiple levels of reality and value based activism for human empowerment and realists assume that reality has several levels and that what is observed on the surface level does not easily reveal significant structures or causal mechanisms at deeper levels (Neuman 2006).

The basic assumptions guiding the constructivist paradigm are that knowledge is socially constructed by people active in the research process, and that researchers should attempt to understand the complex world of lived experience from the point of view of those who live it (Schwandt 2000). The constructivist paradigm emphasises that research is a product of the values of researchers and cannot be independent of them (Mertens 2005, p.16). This is where constructivism differs from critical realism.

Critical realists retain an ontological realism (the view that there is a real world that exists independently of our perceptions, theories and constructions), while accepting a form of epistemological constructivism and relativism (the view that our understanding of this world is inevitably a construction from our own perspectives and viewpoints) (Maxwell 2012, p.5). Constructivists, on the other hand, share the same epistemological position whilst maintaining an ontologically relativist position. In constructivism, realities are apprehensible in the form of multiple, intangible mental constructions which are socially and experientially based, local and specific (Guba & Lincoln 1994, p.110).

The researcher aligns herself with the constructivist paradigm rather than any of the others for two main reasons. Firstly, she believes that is impossible for her own values not to play a part in the design of the research and comprehension of results. Her understanding of the literature, the wording of the research questions and her conclusions about the results, despite perhaps being subconscious, are all intrinsically linked with her values, life experience and what she sees as reality. The same can be said for the participants and their responses.

Secondly, the researcher holds the position that the world (and all its realities) are constantly changing. Therefore, predictions and hypotheses which may hold true at one time may not necessarily be true for
the future. Such a viewpoint is contradictory to the positivist and post-positivist research paradigms (Guba & Lincoln 1994).

A researcher with a constructivist orientation should rely as much as possible on the participants’ views of the situation being studied (Creswell 2003). In this study, the researcher wished to understand the full range of perceptions held by the participants in relation to environmental sustainability at their respective mine sites. She did not wish to restrict the potential findings by making assumptions about what is likely to exist. It is for this reason that the constructivist paradigm was selected as the foundation of the research.

3.3 Research Methodology

3.3.1 Purpose of the research

There are three broad purposes for research – exploratory, descriptive and explanatory (Neuman 2006). Exploratory research is conducted to explore areas where not much research has been done before. It creates a general picture of what is occurring and acts as a basis for future research. Descriptive research provides an in-depth and detailed view of a situation. It can clarify previous research findings or contradict past data. Explanatory research is used to test theories or extend theories to new issues or topics (Neuman 2006). Table 4 outlines the differences between the three approaches.

Table 4: Comparison of different research purposes

<table>
<thead>
<tr>
<th>Exploratory</th>
<th>Descriptive</th>
<th>Explanatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Become familiar with the basic facts, setting and concerns.</td>
<td>Provide a detailed, highly accurate picture.</td>
<td>Test a theory’s predictions or principle.</td>
</tr>
<tr>
<td>Create a general mental picture of conditions.</td>
<td>Locate new data that contradicts past data.</td>
<td>Elaborate and enrich a theory’s explanation.</td>
</tr>
<tr>
<td>Formulate and focus questions for future research.</td>
<td>Create a set of categories or classify types.</td>
<td>Extend a theory to new issues or topics.</td>
</tr>
<tr>
<td>Generate new ideas, conjectures or hypotheses.</td>
<td>Clarify a sequence of steps or stages.</td>
<td>Support or refute an explanation or prediction.</td>
</tr>
<tr>
<td>Determine the feasibility of conducting research.</td>
<td>Document a causal process or mechanism.</td>
<td>Link issues or topics with a general principle.</td>
</tr>
<tr>
<td>Develop techniques for measuring and locating future data.</td>
<td>Report on the background or context of a situation.</td>
<td>Determine which of several explanations is best.</td>
</tr>
</tbody>
</table>

Source: Neuman 2006, p.34
The purpose of this research was exploratory. Lewin’s force field analysis tool (which has its foundations in his field theory and three-step model of planned change) was used as a way of exploring why companies are performing at a particular environmental performance level. It aimed to establish what the driving and restraining forces were for maintaining this level at that status quo. In addition, it explored what needed to change in order to achieve the overarching environmental performance target. The research was also designed to create a general picture of conditions in the mining industry which affect environmental management. Furthermore, by applying force field analysis to environmental management, the research helped in developing a tool to measure future sustainability efforts in organisations.

### 3.3.2 Research strategy

There are five main research strategies: experiment, survey, archival analysis, history and case study. Selecting strategies depends on what the research questions are, whether the researcher has control over behavioural events and whether the research will be based on contemporary events or not (Yin 2003). Table 5 outlines which strategies are best suited for each type of research.

<table>
<thead>
<tr>
<th>Research strategy</th>
<th>Form of research questions</th>
<th>Requires control over behavioural events?</th>
<th>Focussed on contemporary events?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>How, Why</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Survey</td>
<td>Who, What, Where,</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>How many, How much</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Archival analysis</td>
<td>Who, What, Where,</td>
<td>No</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td>How many, How much</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>How, Why</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Case Study</td>
<td>How, Why</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: Yin 2003, p.5

The research aims and questions for this study were to establish how well environmental policy and practice align and why there may be any differences between the two. The researcher did not require control over behavioural events during the research and the study focuses on contemporary events. Therefore, case study was considered to be the best option as the main research strategy.
3.3.3 Research approach

The research approach adopted for this study was inductive. Inductive research methods are useful for building new theory, exploring uncharted territory and for confirming/disconfirming theory (Carson et al. 2001). This approach to research was appropriate for this study as the drivers and barriers specific to environmental management in the Australian coal mining industry were not well known or documented. Furthermore, by comparing the results of the study with espoused theory, institutional theory and institutional logic, the research was designed to confirm/disconfirm the applicability of the theories in the context of the industry. In other words, rather than using the theory to apply to the data, the researcher used the data and compared it with existing theories.

**Qualitative, quantitative and mixed method research**

In the simplest terms, qualitative research is concerned with words and quantitative research is concerned with numbers (Trochim 2006). Qualitative research is associated with open-ended questions, people’s perceptions and a broad research focus. Quantitative research on the other hand deals with closed questions, facts, truths and a narrow research focus (Neuman 2006). Both qualitative and quantitative methods can be used appropriately with any research paradigm as questions of method are secondary to questions of paradigm (Guba & Lincoln 1994, p.105). Mixed method research is the collection or analysis of both quantitative and qualitative data in a single study (Creswell 2003, p.15).

This study was qualitative. A qualitative approach allows for a deeper understanding of the phenomenon of interest (Hanson et al. 2005). It enabled as much information as possible to be obtained in regards to the kinds of things that the industry is aiming to achieve and the factors helping and inhibiting their efforts. It did not limit the possible findings by suggesting potential responses to questions.

3.4 Research Design

3.4.1 Main Study

The methods selected to obtain data in the main study were based on insights from both the methodological literature and the pilot study (discussed later in this chapter), whereby different methods were trialled to assess their practicality and suitability.

**Phase 1 – Review of environmental information on mining company websites**
A review of company websites was conducted to determine the espoused environmental sustainability targets of coal mining companies. This phase of the research was related to the first research question: What is the planned overarching environmental sustainability goal (or policy) for the industry?

The following actions were taken in this phase:

**Table 6: Actions taken in Research Phase 1**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Obtain a list of all the major coal mining organisations in Australia and review their environmental sustainability information</td>
</tr>
<tr>
<td>2.</td>
<td>Copy relevant information and compile in single document</td>
</tr>
<tr>
<td>3.</td>
<td>Process document in Leximancer</td>
</tr>
<tr>
<td>4.</td>
<td>Generate concept map and theme and concept list</td>
</tr>
<tr>
<td>5.</td>
<td>Interpret information and summarise findings</td>
</tr>
</tbody>
</table>

**Step 1: Obtain a list of all the major coal mining organisations in Australia and review for environmental sustainability information**

A list of Australia’s coal mining companies was obtained from the Minerals Council of Australia. Each of the mining company websites was reviewed for espoused environmental sustainability action information. Some mining companies did not have such information listed on their websites and were therefore not included in this phase of the research. The companies that were included are shown in Table 7. These companies account for over 80% of the coal mining operations in Australia.

**Table 7: Mining company websites analysed in Research Phase 1**

<table>
<thead>
<tr>
<th>Mining organisation</th>
<th>Address of environmental sustainability information</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMA (under BHP Billiton)</td>
<td><a href="http://www.bhpbilliton.com/home/aboutus/sustainability/Pages/default.aspx">http://www.bhpbilliton.com/home/aboutus/sustainability/Pages/default.aspx</a></td>
</tr>
<tr>
<td>Glencore Xstrata Coal</td>
<td><a href="http://www.xstratacoal.com/EN/SustainableDevelopment/Pages/SustainableDevelopment.aspx">http://www.xstratacoal.com/EN/SustainableDevelopment/Pages/SustainableDevelopment.aspx</a></td>
</tr>
<tr>
<td>Mining organisation</td>
<td>Address of environmental sustainability information</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Australia</td>
<td><a href="http://www.peabodyenergy.com/content/152/Environmental-Responsibility">http://www.peabodyenergy.com/content/152/Environmental-Responsibility</a></td>
</tr>
</tbody>
</table>

The author searched the websites for environmental sustainability information in the form of policies, visions, statements of commitment and descriptions of organisational values. Such information was considered to be representative of what the companies said they were aiming to achieve. With regard to the overarching research aim of determining whether environmental sustainability policy and practice align in the industry, this data accounted for the policy component.

**Step 2: Copy relevant information and compile in single document**

The environmental sustainability information from each website was copied and pasted into a single word document for analysis. Having all narratives in one document enabled analysis of all the different company information at once and made the upload of data into Leximancer much simpler. In addition, it allowed for the collation of one set of results which was representative of environmental sustainability approaches across the industry. Leximancer is capable of importing numerous different file types, however, the most user-friendly and easy to analyse option was found to be Microsoft Word. The use of Excel seemed to cause confusion in Leximancer as to which text exactly it was supposed to be analysing and it generated themes which were not even words in the English language.

**Step 3: Process document in Leximancer**

The data analysis was conducted with the computer-aided qualitative data analysis program, Leximancer. There are no formal universal rules to follow in analysing, interpreting and evaluating qualitative data (McLellan et al. 2003, p.63). Qualitative data analysis is much less standardised than quantitative data analysis (Neuman 2006). Analysing qualitative data can be a daunting task due to the sheer volume of data often collected (Maxwell, 1998). Fortunately, there are now software packages, such as Leximancer, available to automatically sort the data and analyse the results, making the process much quicker and easier (Denzin & Lincoln 1998). Other benefits of using computer-aided programs...
include engagement with the research question, improved familiarity with detail, mastery of the data and a reduction in the enormity of data. This is in addition to enhanced systemisation, logic, speed and rigour in the data collation and analysis process (Crofts & Bisman 2010).

The commonly used strategies for qualitative analysis fall into three main groups: categorising strategies (such as coding and thematic analysis), connecting strategies (such as narrative analysis and individual case studies), and memos and displays (Maxwell 1998, p.236). Leximancer combines the three commonly used qualitative data analysis strategies. The makers of the program describe it as a data-mining tool that can be used to analyse the content of collections of textual documents and to visually display the extracted information. The information is displayed by means of a conceptual map that provides a bird’s eye view of the material, which presents the main concepts contained within the text and how they are related (Leximancer 2005, p.5).

Leximancer is a content analysis program. Content analysis is a research technique for breaking down text into categories based on explicit rules of coding (Krippendorff 2004). This particular content analysis software increases its reliability by using machine learning rather than the researcher’s interpretations to generate and apply coding to the text. Reliability is also added in the concepts built and meanings attached to the data (Angus-Leppan et al. 2010). Therefore, Leximancer can provide an important and transparent contrast to interpretation by the researcher and so fosters analytic reliability (Guba and Lincoln, 1994). Leximancer does not remove the need for researchers to interpret the results completely (it is required in Step 5), however, it does remove the need for much of the interpretation that manual qualitative analysis involves.

Leximancer was selected above other computer assisted qualitative data analysis programs for three main reasons. Firstly, Leximancer generated results (in the form of concept maps which are discussed in more detail later in this chapter) that were the simplest to interpret. Secondly, as much of the data for interpretation was already in an electronic format (from the online questionnaire), the benefits of using programs such as NVivo and Atlas.ti, which can transform audio files into text as a means of reducing manual handling of data, were of little use. Lastly, Leximancer appeared to be the most user-friendly and efficient program to import and analyse data. This was in contrast to NVivo, which is renowned for slow source data imports and Atlas.ti, which is known to have frequent system crashes (Koenig 2004). Step 4: Generate concept map and theme and concept list

Leximancer analyses the data and identifies any concepts and themes present. Concepts are groups of words that travel together throughout the text. Themes group together concepts with contextual similarities (Angus-Leppan et al. 2010). In other words, themes are clusters of concepts. The program
produces a map (a concept map) which visually depicts the concepts and themes and their relationships to each (refer to Figure 13).

Concepts are displayed as nodes on the map. The larger the node, the stronger, or more relevant, the concept is within the text. The themes are identified with coloured circles which encompass similar concepts. If the theme circles overlap, this shows their interconnectedness (Leximancer 2011). Themes on a Leximancer concept map are heat-mapped, meaning that hot colours (red, orange) denote the most important themes, and cool colours (blue, green), denote those less important ones (Leximancer 2005). Figure 12 shows the colour coding for concept map themes.

![Strength of themes in descending order](image)

Figure 12: Leximancer concept map colour coding

The actual positioning of concepts and themes on the map itself (for example, top left-hand corner or middle of the page) is not important and can change with every re-run of the data through Leximancer (due to the algorithmic nature of the analysis). However, the position of the concepts and themes in relation to one another does matter (Zaitseva 2013). The closer concepts are to each other, the more connected they are throughout the text (Leximancer 2005). In other words, the closer concepts are to each other on the map, the more likely you are to find them together in the text.

The figure below is an example of a concept map generated by Leximancer. It shows the strongest or most relevant concept (depicted by the largest node) as being ‘LPG’, closely followed by ‘pipework’. These concepts make up part of the strongest theme which is highlighted by the ‘hottest’ colour which is red. The second-strongest theme (yellow/orange in colour) includes concepts such as health and safety. Given its proximity to the strongest theme (i.e. not overlapping or very close), you could say that the two themes are not strongly related or often found in the same context throughout the data.
Figure 13: Example concept map (adapted from Leximancer 2011, p.4). Note that the themes displayed as coloured circles and the 'hottest' colours indicate the strongest themes. The proximity of the themes indicates how closely related they are in the text. Nodes and word labels represent concepts and the sizes of the nodes indicate how large the concepts are in relation to each other. Connections between the nodes indicate likely connectivity paths in the text.

As can be seen by the above concept map, interpretation of what is represented in them is not challenging, as long as the reader understands what the colours, circles, nodes and their placement indicate. This information is readily available in the Leximancer user guide, which should be consulted prior to utilising the program.

The colour coding of the themes to indicate which was the most relevant in the data, the size of the concept nodes and the relative location of them on the maps (discussed earlier in Step 4) make for a relatively simple and effective representation of multi-faceted results. Presented in any other way, the results could seem complex, potentially limiting comprehension and, as such, could increase the likelihood of interpretational error.

Leximancer automatically analyses the raw data and rapidly generates themes, concepts and their relationship to each other. The only decisions which need to be made by the user are whether to combine concepts (for example, where there are two concepts but one is plural such as ‘car’ and ‘cars’), or whether to remove concepts altogether from the results. For example, some concepts could be irrelevant or of no value, such as the words ‘the’ or ‘it’, and including them only complicates the results.
In addition to concept maps, Leximancer also generates entire theme and concept lists (Leximancer 2011). The lists show all of the concepts present in each theme and how relevant they are (as a percentage) in relation to the total data. The lists also provide excerpts of the text where the concept term has been used so that the researcher can gain a understanding of the context the word has been used in (Leximancer 2005). All concept maps generated as part of the study are presented in Chapter 4. Theme and concept lists are included in the appendices.

**Step 5: Interpret information and summarise findings**

The concept maps for Phase 1 of the study were observed for concepts and themes relating to the planned or espoused environmental sustainability objectives expressed by coal mining organisations in Australia. The strongest themes were considered to be common targets across the industry. Concepts in close proximity to one another indicated key phrases and terminology. The number of concepts generated were also taken into consideration in terms of how streamlined the industry’s thinking is on environmental sustainability targets or how differently companies are approaching the topic.

**Research Phase 2 – Online qualitative questionnaire**

This phase of the research was conducted to determine what is happening in practice in regards to environmental targets, environmental performance and the factors affecting them in mining organisations. It was the largest phase of the research and obtained the largest amount of data. The type of information sought from this phase of the research was the same as that required for any standard force field analysis.

Research Phase 2 related to Research Questions 2-6 which were:

2. In practice, what is the overarching environmental sustainability goal for the industry?
3. What is the current level of environmental performance in the industry?
4. What are the drivers (internal and external) for achieving the environmental sustainability goal in the industry?
5. What are the restraining forces (internal and external) impacting environmental sustainability goal attainment in the industry?
6. What is the institutional logic for environmental management in the industry?

The questions were asked of each of the institutional orders in the industry to gain an understanding of whether or not the industry was aligned with its perceptions and whether different factors impact environmental management at different levels of the institution. There were held to be five different
institutional orders relevant for environmental management, these being individual, mine site environmental department, mine site, corporate and industry.

The steps undertaken in Phase 2 were as follows:

Table 8: Actions taken in Research Phase 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Develop questionnaire</td>
</tr>
<tr>
<td>2.</td>
<td>Upload questionnaire to Qualtrics</td>
</tr>
<tr>
<td>3.</td>
<td>Invite participants to complete questionnaire through presentations to industry bodies, phone calls and emails</td>
</tr>
<tr>
<td>4.</td>
<td>Close questionnaire and export collated data from Qualtrics</td>
</tr>
<tr>
<td>5.</td>
<td>Segregate data into relevant research objective groups and institutional orders</td>
</tr>
<tr>
<td>6.</td>
<td>Edit data for spelling mistakes, variations of the same word, abbreviations etc.</td>
</tr>
<tr>
<td>7.</td>
<td>Run data for each research question in Leximancer and generate concept maps and lists</td>
</tr>
<tr>
<td>8.</td>
<td>Edit concept list for redundant and unnecessary words and re-run through Leximancer to generate final concept map</td>
</tr>
<tr>
<td>9.</td>
<td>Interpret information and summarise findings</td>
</tr>
</tbody>
</table>

**Step 1: Develop questionnaire**

As stated earlier in this chapter, survey/questionnaire is the best method for obtaining answers to ‘what’ questions (as were the research objective questions). Findings from the pilot study also suggested that this method would be the most effective means of collecting relevant data. A questionnaire is a means of collecting information from or about people to describe, compare or explain their knowledge, attitudes and behaviour (Fink 2003, p.1). There are numerous types of questionnaires and surveys including household, street, telephone, organisational, customer, captive and mail (Ticehurst & Veal 1999). With the rise of the internet, electronic questionnaires have become
possible and are extremely popular due to their low cost, quick and efficient distribution, response and data analysis (Andrews et al. 2003).

The online questionnaire method was also selected for this phase of the research for practical reasons. Most coal mine sites in Australia are situated in very remote locations. Getting to the sites to conduct face-to-face interviews, observations, focus groups or archival retrieval would have been both expensive and time consuming. Online questionnaires (and surveys) are considered to be the quickest, most cost effective and efficient of all the data collection methods (Zikmund 2003).

The method was also selected for this study because it was known that the desired participants would have access to computers, the internet and email. Environmental professionals at coal mine sites in Australia are dependent on these resources to store their environmental monitoring data, generate reports and communicate with other departments and the wider company. Of all the survey options, an electronic survey was considered to be the most time effective and user friendly method for the participants. For these reasons, the researcher believed that a higher response rate could be achieved by selecting this option.

The online questionnaire is a self-administered questionnaire. It is where the respondent, a member of the sample, takes responsibility for reading and answering the questionnaire (Zikmund 2000). Although this type of questionnaire has many benefits such as being able to reach a wide variety of people and allowing the participants to respond at a time and location suitable for them, it also presents the researcher with a couple of challenges: the response rate is often relatively low and the participants cannot clarify any of the questions with the researcher when they are completing the questionnaire (Lavrakas 2008).

These issues were addressed by ensuring the questions in the questionnaire were as clear as possible so that there would be little confusion. The pilot study helped to identify the types of questions that would be clearly understood. The researcher also provided her contact details on the questionnaire form, in addition to the information sheet, and offered to help should any participant require assistance with the questionnaire. The questionnaire was cross-sectional. This is one of the two main types of questionnaires. The other being longitudinal (Babbie 1990). Longitudinal surveys gather data over a period of time, whereas cross-sectional questionnaires gather information at a single point in time. This type of questionnaire was the most appropriate for the study as the researcher wanted to gain insight into the situation in the mining industry at that particular point in time.
Questionnaire design

In an attempt to make the questionnaire clear and easy to understand, the researcher incorporated the following advice from Kelley et al. (2003, p.263): Questionnaires used in survey research should be clear and well presented. The use of capital letters only should be avoided, as this format is hard to read. Questions should be numbered and clearly grouped by subject. Clear instructions should be given to make the questionnaire easier to follow. In addition, the researcher must think about the form of the questions, avoiding ‘double-barrelled’ questions (two or more questions in one), questions containing double negatives, and leading or ambiguous questions.

The questionnaire in this study contained both open-ended and closed questions. The reason for this is that there were numerous research questions which required answering. Some were ‘yes’ or ‘no’ type questions, some had specific pre-determined options (such as where along the sustainability scale the organisations were performing) and some required the respondents to answer with their own perceptions and words without limitation or prompting from the researcher. The design of the study was also based on the force field analysis tool which required some specific questions to be answered (as discussed in the Chapter 2).

A full list of the survey questions and how they relate to the literature and overarching research questions is provided below in Table 9.

Table 9: Questionnaire and supporting information

<table>
<thead>
<tr>
<th>Questionnaire question</th>
<th>Relates to research objective #</th>
<th>Relates to literature</th>
<th>Information to be obtained</th>
<th>Question type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Which of the following describes your environmental role?</td>
<td>1-7</td>
<td>Institutional orders, organisational behaviour, institutional theory</td>
<td>Which institutional order the participant is from</td>
<td>Closed</td>
</tr>
<tr>
<td>2. What do you perceive is the overarching environmental management goal at your level of accountability?</td>
<td>1.</td>
<td>Force field analysis (what is the target?), espoused theory/theory-in-use</td>
<td>What the environmental goals are at each of the institutional orders and whether they align</td>
<td>Open</td>
</tr>
<tr>
<td>3. Who do you perceive sets the overarching goal at your level of accountability?</td>
<td>2.</td>
<td>Force field analysis (driving force for change), change management leadership, institutional theory</td>
<td>Where the drive comes from for the environmental target</td>
<td>Open</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
<td>Format</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chapter 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. What is your perception of why your industry/corporation/site/department has the environmental target that it does?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Institutional logic, institutional theory</td>
<td>Why the goal is set at the level it is</td>
<td>Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Which of the following describes your perception of the current environmental performance level at your level of accountability (i.e. industry, corporation, site or department)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Sustainability performance indicator scale, force field analysis (what is the status quo?), espoused theory/theory-in-use</td>
<td></td>
<td>Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. a) Do you believe your level of accountability will ever surpass the current level of performance?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) If not, why? If yes, what needs to change to enable that to happen?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Force field analysis (what are the restraining forces?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. What do you perceive are the three strongest internal (to the industry/corporation/site/department) driving forces towards your environmental target at your level of accountability?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Force field analysis (what are the driving forces?), change management</td>
<td></td>
<td>Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. What do you perceive are the three strongest external (to the industry/corporation/site/department) driving forces towards your environmental target at your level of accountability?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Force field analysis (what are the driving forces?), change management</td>
<td></td>
<td>Open</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>9. What do you perceive are the three strongest \textit{internal} (to the industry/corporation/site/department) \textit{restraining forces} working against your ability to achieve your environmental target at your level of accountability?</td>
<td>5. Force field analysis (what are the restraining forces?), change management</td>
<td>What the restraining forces are on environmental management internal to the industry at each of the institutional orders</td>
<td>Open</td>
<td></td>
</tr>
<tr>
<td>10. What do you perceive are the three strongest \textit{external} (to the industry/corporation/site/department) \textit{restraining forces} working against your ability to achieve your environmental target at your level of accountability?</td>
<td>5. Force field analysis (what are the restraining forces?), change management</td>
<td>What the restraining forces are on environmental management external to the industry at each of the institutional orders</td>
<td>Open</td>
<td></td>
</tr>
<tr>
<td>11. Which of the following do you perceive to have the biggest positive influence on your ability to achieve your environmental target at your level of accountability?</td>
<td>4. Institutional theory</td>
<td>What are the strongest institutional forces which impact environmental management?</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>12. Which of the following do you perceive to have the second biggest positive influence of your ability to achieve your environmental target at your level of accountability?</td>
<td>4. Institutional theory</td>
<td>What are the strongest institutional forces which impact environmental management?</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>13. Which of the following do you perceive as preventing you the most from achieving your environmental target at your level of accountability?</td>
<td>5. Institutional theory</td>
<td>What are the strongest institutional forces which impact environmental management?</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Method</td>
<td>Response Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Which of the following do you perceive as the second-strongest</td>
<td>Institutional theory</td>
<td>Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>restraining force preventing you from achieving your environmental</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>target at your level of accountability?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. What is your perception of why your industry/corporation/site/</td>
<td>Force field analysis (what are the restraining forces, what needs to</td>
<td>Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>department not achieving its environmental target (if it is not)?</td>
<td>be overcome to achieve goal)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. What do you perceive is the motivation for your industry/corporation</td>
<td>Institutional logic</td>
<td>Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/site/department to achieve the environmental target?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. a) Is there an incentive to for your industry/corporation/site/</td>
<td>Force field analysis (driving forces), institutional logic</td>
<td>a) Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>department to achieve the environmental target?</td>
<td></td>
<td>b) Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) If so, what is it?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. What is your perception of what would have to happen for the</td>
<td>Force field analysis (action planning to achieve target)</td>
<td>Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>industry/corporation/site or department (depending on your level of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>accountability) to reach its environmental target?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>What are the three strongest internal forces (to the industry/corporation /site/department) driving <strong>YOU</strong> towards your environmental target at your level of accountability?</td>
<td>4.</td>
<td>Force field analysis (what are the driving forces?), change management</td>
<td>5.</td>
</tr>
</tbody>
</table>
25. Which of the following prevents YOU the most from achieving your environmental target at your level of accountability?

<table>
<thead>
<tr>
<th>Question</th>
<th>Theory</th>
<th>Reasoning</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following prevents YOU the most from achieving your environmental target at your level of accountability?</td>
<td>Institutional theory</td>
<td>What the strongest institutional forces are that are impacting environmental management at the individual order</td>
<td>Closed</td>
</tr>
</tbody>
</table>

26. Which of the following is the second strongest force preventing YOU from achieving your environmental target at your level of accountability?

<table>
<thead>
<tr>
<th>Question</th>
<th>Theory</th>
<th>Reasoning</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following is the second strongest force preventing YOU from achieving your environmental target at your level of accountability?</td>
<td>Institutional theory</td>
<td>What the strongest institutional forces are that are impacting environmental management at the individual order</td>
<td>Closed</td>
</tr>
</tbody>
</table>

27. What is the motivation for YOU to achieve the environmental target of your industry/corporation/site/department?

<table>
<thead>
<tr>
<th>Question</th>
<th>Theory</th>
<th>Reasoning</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the motivation for YOU to achieve the environmental target of your industry/corporation/site/department?</td>
<td>Institutional logic</td>
<td>What the reasoning is around reaching the environmental target for the individual</td>
<td>Open</td>
</tr>
</tbody>
</table>

28. a) Is there an incentive for YOU to achieve the environmental target of your industry/corporation/site/department? b) If so, what is it?

<table>
<thead>
<tr>
<th>Question</th>
<th>Theory</th>
<th>Reasoning</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Is there an incentive for YOU to achieve the environmental target of your industry/corporation/site/department? b) If so, what is it?</td>
<td>Force field analysis (driving forces), institutional logic</td>
<td>What’s in it for the individual to reach their environmental target?</td>
<td>a) Closed b) Open</td>
</tr>
</tbody>
</table>

---

**Step 2: Upload questionnaire to Qualtrics**

The questionnaire was administered using the online program Qualtrics. Qualtrics is an online tool for creating and distributing surveys/questionnaires (Qualtrics 2014). It was selected due to its ease of use, its capacity for storing and exporting data and its ability to reach a wide number of participants. The program also provided a link to the questionnaire which could be emailed or posted to social media interfaces.

**Step 3: Invite participants to complete questionnaire through presentations to industry bodies, phone calls and email**

Sampling procedures in qualitative research require appropriate and purposeful sampling and a ‘good’ informant (Coyne 1997). Purposive sampling (as opposed to random sampling), is one of the most common sampling strategies and it groups participants according to preselected criteria relevant to a
particular research question (Given 2008). As this study focussed on the sorts of things that affect the way the environment is managed by mining companies, it required participants who were experienced in managing the environment in such organisations. In other words, participants were required to have some sort of environmental management responsibility as part of their role in their company.

This requirement became clear during the pilot study because interview and questionnaire participants who did not have environmental management experience were unable to understand or answer some of the questions. Participants were required to have had mining environmental experience at an Australian coal mining company within the twelve months prior to completing the survey. This was to ensure that all of the responses were representative of the current situation in the industry. In addition, all participants had to be willing to take part in the research.

Participants were sought from mining companies, mining environmental consultancies and industry bodies. The Australian coal mining industry comprises 24 mining companies and approximately 60 operating mines across Queensland, New South Wales and Victoria (Australian Coal Association 2013b). Based on the organisational charts of three different coal mining organisations, on average, mine sites are likely to have two environmental professionals and two levels of management above them with environmental management accountability (i.e. one manager for their department and one for the whole site). At the corporate level, there is usually one environmental professional and one senior manager whom they directly report to.

As the researcher wanted to gain an understanding of what was happening throughout the industry, there was no selection criterion for the types of companies who took part. The study was not focussed on specific companies, rather, it examined the different levels within the companies and the industry. As long as the mining companies had a mine site environmental department, a management team responsible for environmental management at the mine site and corporate management team, they were considered suitable for the study.

An internet search for consultancies who offered holistic environmental management support to the industry (rather than sub-consultation with specialist services) found a total of 68 companies. A similar search of industry bodies with environmental interests discovered nine in total across Australia. All in all, it was estimated that there were approximately 400 professionals in the industry with environmental accountability as part of their job roles. It should be noted, however, that the coal mining industry is a boom and bust industry and therefore the number of people working in it greatly fluctuates on a regular basis (Rolfe et al. 2007).
To ensure representation from all of the different institutional orders, participants were sought from the mine site environmental department level, the mine site management level and the corporate level. To gain a perspective of what was happening at the industry level, the Australian Coal Association, the Minerals Council of Australia, the Australian Coal Association Research Program (ACARP) and the Queensland Resources Council and consultants who represented more than one coal mining company were contacted. As all participants were also individuals, there were questions in the survey directed at them specifically in order to gain an understanding of the individual institutional level.

Potential participants were sourced in three different ways. Firstly, they were sourced by obtaining contacts through industry environmental committees and secondly by conducting a search on the internet for mining company contact details. The environmental committees contacted were: The Australian Coal Association Research Program’s (ACARP) Environmental Task Group, the Queensland Resources Council’s Environmental Committee and the Central Queensland Mine Rehabilitation Group. The researcher attended meetings held by each of these groups and gave an overview of the research. She then asked if any of the members or their colleagues would be interested in participating. For those who agreed, their contact details were obtained and they were advised that the researcher would be in contact at a later date.

Secondly, mining companies who were not represented by the abovementioned groups were contacted directly by phone after their contact details were sourced online. The employees and management team members with environmental management experience were then asked to take part. Finally, the researcher asked colleagues in the industry if they could email the information on the project to environmental professionals that they worked with. She developed a standard email with all of the relevant information and an invitation for them to participate so that it was easy for the mining industry contacts to forward. Given the ease of forwarding an email, the researcher hoped that her contacts would be inclined to help.

An information sheet explaining the background of the study, the purpose of the research and the ethical obligations of the researcher was provided to all participants prior to their involvement into the study. The information sheet is attached to the thesis as Appendix 1. Survey participants indicated their consent to take part in the research by completing the questionnaire. Interviewees were required to sign a consent form prior to commencing the interviews.

Step 4: Close questionnaire and export collate data from Qualtrics

The online qualitative questionnaire was open for a period of six weeks from May 2013. During this time 58 responses were received. Of this 58, one was only partially completed (one question answered
out of the entire survey) and therefore not included in the results. No exact response rate can be determined as the survey was sent out online through various networks and it is difficult to know how many people viewed the request to complete it.

The 58 participants were from 26 different companies ranging from the largest mining company in the industry to sole consultancies. Samples for qualitative studies are generally much smaller than those used in quantitative studies. There is a point of diminishing return to a qualitative sample. Qualitative samples must be large enough to ensure that most or all of the perceptions that might be important are uncovered, but at the same time if the sample is too large data becomes repetitive and, eventually, superfluous (Mason 2010, p.1).

The participants were asked which institutional order they represented out of mine site environmental department, mine site management, corporate and industry. In addition, participants were asked questions relating to them as individuals and this information was considered as representative of the individual institutional order. The numbers of responses for each institutional order are listed in Table 10.

Table 10: Number of participants from each institutional order

<table>
<thead>
<tr>
<th>Institutional order</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>57</td>
</tr>
<tr>
<td>Mine site environmental department</td>
<td>14</td>
</tr>
<tr>
<td>Mine site management</td>
<td>7</td>
</tr>
<tr>
<td>Corporate level</td>
<td>22</td>
</tr>
<tr>
<td>Industry level (industry bodies and consultancies)</td>
<td>14</td>
</tr>
</tbody>
</table>

Once the questionnaire was closed, the data was compiled in Qualtrics and exported as an Excel file for analysis.

**Step 5: Segregate data into relevant research objective groups and institutional orders**

The data was categorised in two ways. Firstly, it was broken down into material relevant to each research question. This generated a data set for the total group of participants for each of the research questions/objectives. Following this, the data was further broken down into material relevant to each institutional orders which were individual, department, mine site, corporate and industry. Breaking the data into material relevant to each of the institutional orders enabled comparisons to be made against each of the orders and the total group in the results.
Step 6: Edit data for spelling mistakes, variations of the same word, abbreviations etc.

As Leximancer mines the text for words which are exactly matching in order to generate concepts and themes, it was imperative that words were spelt correctly and there were no acronyms in the text. Every response by every participant who took part in the questionnaire was reviewed, spell checked and corrected to ensure that the results were an accurate representation of the text. The interview data was reviewed for any spelling mistakes, readability of the responses (to check that they made sense) and any missing words.

Step 7: Run data for each research question in Leximancer and generate concept maps and lists

The data was uploaded and analysed in the same way as the website material in Phase 1 of the research.

Step 8: Edit concept list for redundant and unnecessary words and re-run through Leximancer to generate final concept map

Concept lists generated by Leximancer were edited to combine variations of the same word (i.e. licence and licences) and to remove unnecessary words. Words which were considered unnecessary were those which did not contribute meaning to the concept map, and ultimately, made them busier and more difficult to interpret. They included terms such as ‘have’, ‘certain’ or ‘do’ and would have only been generated as concepts due to their frequent use in the responses from participants.

Step 9: Interpret information and summarise findings

The results were interpreted in the same manner as those generated in Phase 1 of the research. Results are presented in Chapter 4.

Research Phase 3 – In-depth interviews

This phase of research was undertaken to establish the best way for the industry to move towards its planned or policy environmental sustainability objectives. This pertains to Research Question 7.
The following steps were undertaken in Phase 3:

### Table 11: Actions taken in Research Phase 3

<table>
<thead>
<tr>
<th>Step</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Develop interview questions</td>
</tr>
<tr>
<td>2.</td>
<td>Invite and confirm participants</td>
</tr>
<tr>
<td>3.</td>
<td>Conduct face-to-face and phone interviews</td>
</tr>
<tr>
<td>4.</td>
<td>Record data via manual transcription and audio recorder (review and member check prior to conclusion of each interview)</td>
</tr>
<tr>
<td>5.</td>
<td>Compile data and segregate into each interview question</td>
</tr>
<tr>
<td>6.</td>
<td>Run data through Leximancer to generate draft concept map and list</td>
</tr>
<tr>
<td>7.</td>
<td>Edit concept list for redundant and unnecessary words and re-run through Leximancer to generate final concept map</td>
</tr>
<tr>
<td>8.</td>
<td>Interpret information and summarise findings</td>
</tr>
</tbody>
</table>

**Step 1: Develop interview questions**

The interviews were conducted following the completion of the qualitative questionnaire as the findings of the questionnaire were the basis of the interview questions. The interview questions needed to address particular findings of the questionnaire in order for participants to provide advice on how the industry could move forward. The researcher believed the interviews to be more suitable as a second round of data collection as they tend to cover less breadth but in more detail (Woods 2011). As Stokes and Bergin (2006) state, interviews can capture more depth, detail and subtlety regarding participants’ attitudes that other methods of data collection.

The interviews were semi-structured. Semi-structured interviews allow for the standardisation of at least some of the questions which in turn, increases the reliability of the data. This is in addition to making the replication of the interviews possible and making it possible to ask spontaneous questions should they be required (Woods 2011).
According to Lewin (1951), in order to move an organisation towards its target, the restraining forces which are preventing it from achieving its target need to be reduced. Therefore, the interview questions were developed around addressing the restraining forces for achieving environmental sustainability in the industry. There were eight interview questions in total. They were:

1. How could regulation be improved to ensure companies are continually improving and becoming more sustainable?
2. How could achieving compliance be made easier for coal mining companies so that they can be more sustainable?
3. How could regulation be improved to reduce the amount of change that occurs within it (which organisations have difficulty keeping up with)?
4. How could regulation be improved to ensure that the amount of regulation and associated penalties are matched with the severity of environmental harm permitted?
5. How could interaction with the government be improved so that mining operations are not being governed by inexperienced personnel?
6. How could the mining industry go about changing environmental regulation?
7. Why isn’t the target for environmental management in the industry set higher than it currently is (i.e. just above compliance)?
8. What could be done to lift the standard of practice that is widely accepted for environmental management in the industry?

Step 2: Invite and confirm participants

Potential participants were contacted via telephone and asked if they were willing to take part. The researcher had already been in contact with most of the potential participants during the second research phase. All participants were required to have at least five years’ experience in environmental management in the industry. This was simply because the types of questions asked were in-depth and technical and needed a strong knowledge base on the topic for the participants to be able to understand and respond.

Step 3: Conduct face-to-face and phone interviews

Interviews were conducted both in person (for participants based in Brisbane and Blackwater, Queensland) and by phone. The use of the phones cut out the high cost and travel time which would have been associated with face-to-face interviews. They also gave the participants more flexibility as they could actually be conducted anywhere with phone reception (i.e. from work, a hotel or home). Each interview lasted no longer than 45 minutes.
In all, 11 in-depth interviews were conducted in October 2013. Two face-to-face interviews were conducted at a mine site in Central Queensland, while another was undertaken at a mining company corporate office in Brisbane. The rest of the interviews were conducted by phone.

**Step 4: Record data via manual transcription and audio recorder (review and member check prior to conclusion of each interview)**

Interview responses were manually transcribed by the researcher and also audio recorded. Prior to the conclusion of each interview, the researcher read the responses back the participant to ensure that the transcription was an accurate account of what they had said.

**Step 5: Compile data and allocate to each interview question**

All interview responses were compiled and edited for spelling mistakes, and abbreviations. The data was then and broken down into material relevant to each question, ready for analysis in Leximancer.

**Step 6: Run data through Leximancer to generate draft concept map and list**

The data set for each question was uploaded into Leximancer in the same manner as previously mentioned in research Phases 1 and 2.

**Step 7: Edit concept list for redundant and unnecessary words and re-run through Leximancer to generate final concept map**

As conducted in Phase 2 of the research.

**Step 8: Interpret information and summarise findings**

As conducted in the previous two research phases. Results are displayed in Chapter 4.

### 3.4.2 Pilot Study

In order to determine which method of obtaining data would be the most effective for the research, a pilot study was initially conducted. A case study of a small coal mining company in Queensland made up the pilot. This case study consisted of a focus group session, face-to-face interviews, a document review and a self-administered questionnaire (Appendices 2-7). A pilot case study is important for checking data collection and the effectiveness of the research design and to reveal weaknesses, inadequacies, ambiguities and problems in aspects of the research (Anuntaakalakul 2005).

Secondary to the aim of establishing which methodology would be most suitable for the main study, was the aim of conducting a force field analysis for environmental management in the company.
Institutional forces affecting environmental management in the company only were focussed on in the pilot study (as only institutional forces were going to be analysed for the main study also at that stage). The force field analysis tool was utilised to determine what level the company was performing at in environmental management, what their overarching environmental management target was, what forces were helping them achieve their target and what forces were hindering them.

**Focus group**

A focus group was chosen as a method to trial on account of its ability to obtain a large amount of information in a short period of time (Zikmund 2003). Focus groups include a number of participants all at once and often generate in-depth conversations on the topic at hand as participants talk amongst themselves (Neuman 2006). In addition, they are perfect for an office environment where employees from the same office are taking part in the same research study, as they can be conducted in one of their normal meeting rooms.

The pilot study focus group was undertaken with the senior management team of the company (eight people in total) at their corporate office. The aim of the session was to complete a force field analysis, focussing on the driving and restraining forces influencing actions taken by the company to minimise the environmental harm it caused. The participants were given the list of questions to individually document their responses prior to the commencement of the group discussion. The session took two hours in total.

The advantage of the focus group was that it was time efficient and gained input from a number of people all at once. In addition, it acted as an education session for many people in the room who were not aware of the environmental issues facing the company. The downside of the focus group was that group discussions were dominated by two participants, namely the CEO and Chief Operating Officer who had greater hierarchical status than the other participants.

The results of the group discussions were very different from the collective results of the individual responses. The group discussion results were only representative of the views of the two dominant participants, which meant that even though there were numerous participants with relevant information to share, they may as well have not taken part in the discussions as their views were not heard. As a result it became evident to the author that this data collection method was not an effective means of gaining valuable insight from all participants.
Interviews

Interviews were trialled as a data collection method due to their well-known ability to obtain in-depth data and their flexibility which enables the researcher to ask unplanned questions as they arise (Neuman 2006). Two face-to-face interviews were conducted at one of the company’s mine sites. The interviews lasted approximately 40 minutes and included both open ended and closed questions. The interviews were recorded and responses were also transcribed by the researcher. One of the interviews was with an environmental professional and the other was with a staff member who did not have direct accountability for managing the environment. This was done intentionally in order to gauge whether mine site personnel who did not manage the environment on a day-to-day basis would have enough knowledge of environmental management issues to understand the interview questions and provide reliable information. Although the non-environmental professional did provide a different perspective on some of the topics discussed, there was also a clear lack of understanding of some key questions. It became evident that gaining information from such employees would not be a viable option for the main study. This was confirmed by the types of responses received from non-environmental staff in the pilot surveys as well.

The interviews had merit in that the researcher was able to identify which questions needed to be reworded in the main study so as to achieve greater clarity. More in-depth information was also obtained because the interviewer was able to ask more questions as they came up and the interviewees were able to ask questions themselves. Furthermore, the interviews made for quick response times as the data was collected instantaneously at the time of the interview (rather than having to wait for participants to respond via the mail etc.). On the negative side, the interviews proved very time consuming and costly. The mine site was located in regional Central Queensland which meant a premium cost flight to the regional centre, a hire car and 1.5 hours of driving each way to get to and from the site. Such travel is a common requirement for coal mine sites in Australia. For this reason, face-to-face interviews were not found to be a practicable option for data collection in the main study.

It was noted that phone interviews would cut the time and cost of travel. The interviews would still be somewhat time consuming due to the need to transcribe participants’ responses. However, it was considered to be a much more feasible option than travelling to sites. Such interviews would be suitable for collecting in-depth information from a small number of participants, for example to obtain a more in-depth understanding of issues arising from the initial rounds of research.
Document review

A document review was trialled as a data collection method due to its ability to retrieve archival information and information that may contain hidden or subconscious themes (Yin, 2003). A search of the company’s relevant environmental management documents showed what the environmental targets were and how the environment was managed. Documents such as the environmental policy, risk register, procedures and training material were viewed.

Unfortunately, the documents did not clearly indicate what the driving and restraining forces were for environmental management. Such information, it seemed, could only be obtained from staff who were, or who had been, responsible for environmental management at the site. Therefore, it became evident that to obtain data on driving and restraining forces, those people would need to be asked directly.

Self-administered questionnaire

Finally, a self-administered questionnaire was distributed via email to an onsite environmental professional and a non-environmental professional. This method of data collection was selected to trial due to its ability to reach participants in distant locations, its relatively low cost and its convenience for participants who were able to complete it at a time suitable for them (Neuman 2006).

As with the interviews, the questionnaire highlighted questions which were not clear and needed rewording for the main study. The questionnaire demonstrated again the need for people with direct environmental accountability to be participants in the study as those who did not have such experience were less knowledgeable about the issues. The self-administered questionnaire was the most efficient method out of all in terms of time, cost and data transcription. They were sent by the researcher and received by the participant instantaneously via email. There was almost no cost at all (besides the associated internet and computer usage) associated with sending the questionnaires electronically and the responses were documented by the participants themselves rather than the researcher having to transcribe them. For these reasons, it became apparent that a self-administered questionnaire would be the most effective methodological option for the main study.

The other benefit of the self-administered questionnaire was that it gave the participants choice on when to complete it. This meant that they could do it on a day that they were less busy or even at home. As a result, the questionnaire may have been less of an imposition on the participants. On the other hand, this freedom could also lead to the participants taking a long time to respond or to their not responding at all. It was noted that this was something that would need addressing in the main study.
Conclusions on methods for use in main study

The pilot study helped to refine the methodology for the research in three ways. Firstly, it highlighted which questions would need clarifying to be better understood by participants. Secondly, it demonstrated the need for participants to have direct environmental management accountability at the mining companies if relevant data was to be obtained. Finally, it made it clear that an online, self-administered questionnaire would be the most suitable data collection method for the main part of the study. Interviews were considered the second most suitable data collection method and could be utilised to gain more in-depth knowledge of findings following the survey stage.

In terms of data analysis, the pilot study highlighted how time consuming manual analysis of qualitative data can be. Simply becoming familiar with all of the focus group, survey and interview responses took two entire days and that was without coding or grouping into themes. As a result, the researcher quickly became aware of how beneficial the use of a qualitative data analysis software program would be.

Analysis of pilot study data

The pilot study data was analysed manually. This is because the data was in so many different formats (i.e. some formal company documents, some focus group qualitative responses, some survey responses) that it was impossible to directly compare them using an automated system. Another reason for not being able to directly compare different data sets was that some of the questions were worded differently in different data sets so that the author could determine the most effective wording to get the types of information she required. The data was analysed to determine the strongest themes in regards to current environmental performance level, the industry’s overarching environmental target, and the driving and restraining forces for achieving that target.

Pilot study results

The level of environmental performance at the company was unanimously described as ‘compliant’. This placed the company at the middle along the sustainability scale. The overarching aim of environmental management at the organisation was agreed to be ‘reduce the environmental footprint and become more sustainable’. Although all written responses by participants (including those in the focus group session) had stated that this was the aim of the company, there was discussion in the focus group session which suggested that the company was actually striving to achieve compliance at this point, rather than to reduce its environmental footprint as much as possible.
The strongest external driving force for reducing the company’s environmental harm was found to be coercive, and more specifically, government regulation. The second-strongest driving force was mimetic pressure, with other mining company standards being the most significant of that type of pressure. The weakest external driving force was found to be normative forces. Internally, environmental policy and leadership from environmental professionals and the Chief Operating Officer were considered to be of equal importance as the two strongest drivers for improving environmental performance. Company culture was also considered to be a driving force by many of the participants. There was no clear consensus on whether internal or external forces were stronger for reducing environmental harm. The strongest type of external restraining force was clearly considered to be coercion. More specifically, funding arrangements with financial institutions and the economic environment were thought to be hindering the company’s attempts to improve its sustainability.

The government was thought to be a restraint in a number of ways, such as by developing misguided regulations or laws that are not conducive to reducing the overall environmental impact of operations and the regular changing of legislation and governments. The failure of government to impose penalties on companies who have not complied with their legal obligations and the failure of government to provide more incentives for companies to reduce their impacts were also seen as constraints.

Mimetic forces were the second-strongest type of external restraining force. Acceptance of lower standards by other mining companies and a long history of mining ‘companies not doing the right thing’ when it comes to environmental management were listed as examples of these types of forces. Normative forces were rarely listed as restraining forces in the study. The internal restraining forces were considered to be stronger than the external restraining forces. Of these, culture was considered to be the number one restraining factor. Resource availability, the need to be cost competitive and cash flow were the next-most influential restraining forces.

**Implications of findings for main study**

The greatest realisation from the results of the pilot study was that focussing exclusively on institutional forces would most likely be too limiting. The researcher realised that there could be many other factors which drive or restrain environmental management in the industry that were not classed as institutional forces (such as training, leadership style, location of mine sites, etc.) and she did not want to limit her study so that she would not understand what they were. She wanted her study to be comprehensive and to encompass all possible variables.

The second main finding which was of interest for the main study was that the company was most affected by, or responsive to, coercive forces when it came to environmental management. Given all of
the literature suggesting that most modern organisations have moved past the stage of ‘only acting when they have to’ and are now acting voluntarily to lessen their environmental footprints, this finding was an interesting contradiction. The author was interested in whether this was the same across the entire industry.

3.5 Validity and reliability

Recent history has seen a trend away from the use of the terms validity and reliability in qualitative research and more towards the term trustworthiness (Emden & Sandelowski 1998). The outcome is that ensuring the rigour of the research has become a retrospective activity, done at the completion of the research, rather than an ongoing process throughout. This, resulted in the potential for research error that could not be corrected during the course of the study (Morse et al. 2008). It is for this reason that the author saw value in verifying validity and reliability at numerous stages during the research.

The research for, and writing of, the methods chapter of this thesis exposed the wide range of requirements needed to undertake an effective study. The data from the questionnaire stage revealed which areas of research required further questioning. The interview stage helped to clarify what the data was suggesting and finally, the analysis stage showed whether the findings were actually relevant.

Validity in research means truthfulness (Neuman 2006, p.196). Validity was considered in numerous aspects of the study. The review of the literature, although ongoing throughout the entire study, helped the researcher to have an in-depth understanding of the subject matter and the issues involved. It gave rise to the research questions and ensured their relevance to the topic. The literature review also supported the results of the research in many ways, acting as means of triangulation for the findings.

The pilot study highlighted the types of questions which needed rewording in order to obtain applicable responses and also identified the most effective ways to obtain valid data. The use of the data analysis program Leximancer also contributed to the validity of the research, as responses from the questionnaires were directly copied and entered into Leximancer which ensured that there was no chance for researcher error in data entry. This process also eliminated the risk of the researcher interpreting the data incorrectly.

The main method for collecting data in the research (a self-administered questionnaire) positively contributed to the validity of the study as it is a data collection method whereby the researcher plays a relatively objective role and, as such, cannot influence the results by imposing their own interpretation. Fink (2003) outlines how to ensure that questions in questionnaires and surveys are valid and the researcher took this advice into account when designing the research questions. Questions must make
sense to the respondent, be concrete, use conventional language, be of an appropriate length, avoid biased words, avoid ambiguity, avoid negative phrasing, be appropriate in the use of open and closed questions, and be correctly prepared.

The ways in which the questions were worded in the questionnaire were designed to encourage the participants to give truthful responses. The researcher was careful not to word the questions with any personal bias or in a way that would lead participants to give particular responses. The questions were designed to allow the responses to be uninhibited (Table 9). Reliability means dependability or consistency (Neuman 2006). Qualitative researchers need to be consistent in how, over time, they make observations (Seale 1999). The main research method in this study, a questionnaire, was conducive to obtaining reliable data. The reason for this is that the survey was delivered to all participants in the same way and all of the surveys were exactly the same (i.e. same questions and format). In addition, they were all sent to participants at the same time. Therefore, the way in which the data was obtained by the researcher was standard for all participants.

On the same principle, the in-depth interviews were carried out in a standard manner. They were all conducted either on the phone or in person, had the same interview questions, went for the same amount of time and were conducted within a limited time period (one month). In addition, they all had the same interviewer. Having the same interviewer also ensured that the interviews were recorded and transcribed in the same fashion (i.e. recorded with the same voice recorder, responses written in the same manner and entered into Leximancer using the same procedure).

3.6 Methodological Limitations

In order to engage as many participants as possible for the questionnaire, the link to where it could be completed was sent out via email through numerous sources. This meant that the researcher did not have control over how many participants there were from each institutional order, and could not ensure that there would be an even number in each. However, as this is a qualitative study, this was not an issue as the data did not have to be statistically analysed.

As stated in the Phase 2 section, there are some limitations with self-administered questionnaires. Participants have less ability to clarify queries they have about the questions or the questionnaire process, response rates are often poor, and respondents may not comply with what is asked of them. To address the problem of participants not being able to clarify questions or the questionnaire process, the researcher described the questionnaire process as clearly as possible at the beginning of the questionnaire and when asking the respondents to participate. She also included her contact details on
the survey itself (and the information sheet) and encouraged participants to contact her directly if they had any issues or concerns.

A common limitation for questionnaires and surveys is the poor response rate both in terms of participants not responding to all questions within the questionnaire, or not responding at all (Cantebury 2009). The researcher attempted to reduce this risk by contacting potential participants over the phone prior to sending them the questionnaire. It was believed that if people had spoken to the researcher directly and given a verbal consent to participate, they would be more inclined to do so.

As the researcher had no face-to-face or verbal communication with the questionnaire participants, some non-verbal information such as body language and tonal cues may have been missed. The inability to obtain body language information may also have been an issue for the telephone in-depth interviews, since the researcher could not see the participants.

3.7 Ethical considerations

Prior to undertaking the research, ethics approval was gained from the University (ethics approval number ECN-13-163). As part of the process, the researcher acknowledged the risk to participants, their workplaces and the University if the research were to be conducted in an unethical manner. As a result, the rights and obligations of the affected parties, including privacy and the right to be informed on all aspects of the research, were observed. No research was undertaken without first obtaining written consent from participants (Appendices 1 and 2).

The ethical issue of greatest concern relating to this specific project was participants disclosing information relating to what was preventing their mining organisation from reducing its environmental harm. Such information could have had repercussions at both the individual and the company level. At the individual level, the participants could have felt that by saying something that could be perceived as negative about the company or management, they may have been punished in some way. At the company level, such things as reputational risk or poor public perception of the company could have been an issue if the findings did not remain confidential.

These issues were addressed, first and foremost, by keeping the names of companies and participants confidential. The intention of the research was always to gain information which would be helpful to companies should they wish to use it. It was not to shame individuals or organisations.
3.8 Summary

This chapter described the research methods used in the study. It discussed the research paradigm and methodology supporting the research, and how this informed the research design. The validity and reliability of the findings were then argued, prior to the methodological limitations being set out. Lastly, the chapter discussed the ethical considerations of the study.
Chapter 4  Results

4.1 Introduction

This chapter details the results from the three phases of research – mining company website analysis, the online qualitative questionnaire and the in-depth interviews. A summary of the key findings concludes the chapter. Figure 14 outlines the layout of the results section of the thesis.

This chapter presents the concept maps generated by Leximancer. The entire set of complete theme and concept lists generated for the study can be found in Appendices 8-10. Any themes listed in the chapter which are not self-explanatory are supported by a phrase in italics and in brackets to make them easier to understand (based on what was stated in the full text of survey responses).

Furthermore, only the three strongest themes from each institutional order were compared for each question in the results. This was to help illuminate the most significant findings of the questionnaire and make the results easier to understand. Often, there were only two or three themes for an analysis set, so limiting the number of themes discussed in this chapter to three seemed appropriate.
4.2 Research Phase 1 (website review) results

4.2.1 Research Question 1: What is the planned overarching environmental sustainability goal (or policy) for the industry?

Australian coal mining organisation websites were reviewed in the literature review stage of the research. This review revealed specific environmental sustainability goals such as wishing to ‘operate sustainably’, ‘minimise harm as much as possible’ and ‘reduce their environmental footprint’. Further analysis was undertaken in this phase of the research to identify themes, trends and less obvious information.

In reference to Figure 15 and in line with the statements quoted above by mining organisations (and those in Chapter 2), the strongest theme (denoted in red) was found to include concepts such as environmental, sustainable, development, management and mining. When viewing the concepts in the context of the full text, it was clear that the mining organisations are aiming to manage their mining impacts so that they could operate sustainably and that they aspired to have sustainable development in their organisations. In relation to the sustainability scale developed by Dunphy et al. (2003), this would place planned or overarching environmental sustainability targets for mining organisations in the Australian coal mining industry at Level 6 – the sustaining organisations.
The second-strongest theme was centred on local communities. The fact that the theme overlapped with the strongest theme meant that mining companies appear to be especially interested in managing their impacts on local communities. When put into the context of the full text, it becomes apparent that mining organisations are aiming to operate in a manner that does not negatively impact their local communities. The themes ‘benefit’ and ‘better’, although not strong themes, also overlapped this theme which supports the above finding that the mining organisations want to support their communities.

The themes benefit and better were also in relatively close proximity to the environment theme. This may indicate that the organisations would like to see the environment benefit and improve from their operations. These key terms are also in line with Dunphy et al.’s (2003) sustaining organisation description (which is the highest organisational sustainability level in their sustainability phase scale). A key aspect of the sustaining organisation is the desire to better the environment, not just minimise impacts on it. The existence of these two themes (benefit and better) supports the initial finding indicated by the strongest themes which was that organisations are in fact aiming to become sustainable organisations.

The third-strongest theme identified a specific aspect of environmental management that is obviously important to the industry – water. The industry claims to want to reduce its impact on water in two ways. Firstly, it wants to reduce the usage of water as companies see it as a valuable and often scarce resource. Secondly, it wants to minimise its negative impact on water quality.

Energy (another specific aspect of environmental management) also appeared as a theme on the map. Its appearance suggests that, at present, mining organisations are focussing more on water management and energy usage than any other aspects of environmental harm (i.e. dust generation or waste management). The distinct distance of these themes from the main theme (centring on sustainable development) may, however, indicate that the mining organisations see them as ‘tag on’ aspects of the business, rather than intertwined with sustainable mining.
4.3 Research Phase 2 (online qualitative questionnaire) results

4.3.1 Research Question 2: In practice, what are the perceived overarching environmental management goals?

**Total group results**

![Concept map of overarching environmental target for total group of participants](image)

The concept map above (Figure 16) indicates that the main overarching environmental target for companies in the industry is to achieve compliance. This indicates that compliance is the greatest priority when organisations consider environmental management targets. This was followed by the second-strongest theme which was centred on reducing the environmental impacts caused by operations. The third-strongest theme in relation to the environmental target set by organisations was centred on meeting legislative requirements (which again, is essentially compliance).

The three strongest themes listed above were not the only themes generated by Leximancer in the concept map. This suggests that organisations within the industry to do more than just comply with their regulatory requirements. The fact that the second strongest-target theme was to do with reducing environmental impact indicates that there is some genuine desire for companies to achieve more than compliance. However, at this stage, achieving compliance is the number one priority.
In terms of where the target would sit along the Dunphy et al. (2003) sustainability scale (discussed in Chapter 2 with the organisational environmental sustainability stages of rejection, non-responsiveness, compliance, efficiency, strategic proactivity and the sustaining corporation), the findings would suggest the target would be placed somewhere between ‘compliance’ and ‘efficiency’. Had the sole target theme been compliance, the target could clearly have been ‘Compliance’ but as there were other strong themes centring around impact reduction and being more sustainable, it appears that the target is actually higher than simple compliance.

The strongest themes also do not overlap and are not in close proximity to each other. This could suggest that compliance and environmental impact are not thought of in the same vein by organisations. In other words, achieving compliance and reducing environmental harm may not be considered to be related.

**Results for each institutional order**

Comparisons between each of the institutional orders are made after the final concept map in this section.

![Environmental target concept map for industry institutional order](image)

**Figure 17: Environmental target concept map for industry institutional order**

Figure 17 shows that at the industry level, achieving compliance is the greatest aim. That is not the only target, however. Reducing harm is the second-highest priority and being sustainable is the third.
Obtaining necessary approvals to operate is the fourth-greatest target and minimise (in relation to minimising environmental harm) is the fifth. The second and fifth themes are very similar and could even be combined. It should be noted that the compliance and reducing harm themes do not overlap. This may indicate an underlying belief by the participants that achieving compliance does not necessarily reduce harm.

The number of themes generated indicates that at the industry level, organisation are aiming for more than one thing (i.e. compliance), however, achieving compliance is their number one priority. As reducing harm or operating sustainably were not the strongest themes, it could not be said that this institutional order, as a whole, is aiming to operate sustainably or reduce environmental harm. It can only be said that they are aiming to achieve more than just compliance.

Figure 18: Environmental target concept map for corporate institutional order

In Figure 18, the strongest theme at the corporate institutional order is focussed on environmental impact. It includes concepts such as mining, activities, impact and environment. This would suggest that this institutional order is aiming to reduce the impact of coal mining activities on the environment. The second-strongest theme is cost effectiveness. The order in which the first two themes were generated indicates that the corporate level is interested in reducing harm, but in a cost effective manner. The two themes do not overlap, however, which indicates that they may not be thought of as synonymous.
terms. Compliance was the third-strongest aim which suggests that it is still a focus at the corporate level, just not as much as environmental impact reduction and cost effective management.

As Figure 19 shows, the strongest theme at the site institutional order was found to be achieving compliance. This was followed by harm reduction and then effective site management. Only three themes were generated, indicating that at the site level in organisations, there is a narrower focus. It could be said that this institutional order is aiming for more than simply achieving compliance (because there were more themes generated that just the compliance theme). However, achieving compliance is the number one aim. It should also be noted that the compliance and harm reduction themes do not overlap which could indicate a belief that compliance is not necessarily related to harm reduction.
Figure 20: Environmental target concept map for department institutional order

Figure 20 indicates that achieving compliance was again the strongest theme generated for the environmental sustainability target at this institutional order. The theme labelled goal was the second (and only other theme generated) and it contained concepts such as reducing harm. This indicates that the secondary goal for the department level in organisations is to reduce environmental harm. Again, as in the other institutional orders, the compliance theme does not overlap with the theme pertaining to reducing environmental harm.

Table 12: Summary of overarching environmental management target themes for each of the institutional orders

<table>
<thead>
<tr>
<th>Institutional order</th>
<th>Strongest theme</th>
<th>Second strongest theme</th>
<th>Third strongest theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Compliance</td>
<td>Reduce harm</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Corporate</td>
<td>Environmental impact</td>
<td>Cost effective</td>
<td>Compliance</td>
</tr>
<tr>
<td>Site</td>
<td>Compliance</td>
<td>Harm reduction</td>
<td>Effective site management</td>
</tr>
<tr>
<td>Department</td>
<td>Compliance</td>
<td>Goal</td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td>Not possible to assess</td>
<td>Not possible to assess</td>
<td>Not possible to assess</td>
</tr>
</tbody>
</table>

Note: Individual order targets were not sought in the survey as participants were asked to answer this question on behalf of the institutional order that they were accountable for, not as an individual.

At the corporate level, where the environmental targets are set for the corporation, the primary aim is to go above and beyond compliance and actually reduce the environmental impacts of operations. However this goal does not transfer down to the institutional orders, where compliance is the number
one priority. This is also apparent when viewing the concept maps for each of the institutional orders. The higher institutional orders have a broader range of goals and a desire to achieve a larger number of targets. The lower institutional orders have fewer targets, and a narrower range of targets.

4.3.2 Research Question 3: What is the current perceived level of environmental performance?

![Current environmental performance level](image)

**Figure 21: Current environmental performance level for all of the institutional orders**

Note: Individual performance level cannot be measured as the scale refers to group collectives. Participants were asked to answer this question from the perspective of their institutional order level that they were accountable for, not as an individual.

In reference to Figure 21, environmental attributes of organisations at each of the sustainability levels (Benn & Dunphy 2004, p.99)

- Phase 1 – Rejection: The environment is regarded as a free good to be exploited
- Phase 2 – Non-responsiveness: Ecological factors are excluded from decision-making
- Phase 3 – Compliance: Ecological issues that are unlikely to attract strong litigation or strong community action are ignored
- Phase 4 – Efficiency – Environmental issues are ignored if they are not seen as offering opportunities for avoiding costs or increasing efficiencies. Sales of by-products are encouraged.
Phase 5 – Strategic proactivity: Proactive environmental strategies such as product and process redesign are seen as a source of competitive advantage.

Phase 6 – The sustaining organisation: The firm works with society towards ecological renewal and positive sustainability policies.

All institutional orders are performing somewhere between the compliance and efficiency stages of corporate sustainability (however, they have not yet attained the efficiency stage completely so they would still be classed as performing at the compliance level). Given that, in practice, the overarching environmental sustainability target for the entire group of participants was found to be just above compliance, it could be said that the industry is already achieving its overarching environmental management aim (and the mandated aims of the government).

4.3.3 Research Question 4: What are the drivers (internal and external) for achieving the environmental sustainability goal in the industry?

**Total group results**

![Concept map for environmental drivers (internal and external) for total group of participants](image)

The total drivers concept map (Figure 22) shows that community is the strongest driving force for environmental management in the industry. The concepts ‘expectations’ and ‘performance’ were amongst the concepts present in the theme, suggesting that community expectations of company performance had the biggest influence on improving environmental management. In reference to the
greatest driving force for environmental management, one participant stated ‘Community Opinion: I am shocked at the current general community opinion of coal mining. On reflection the industry has a poor reputation due to the historical environmental performance’.

The second-strongest driving force was compliance. The concepts contained in the theme included ‘ensure’ and ‘requirements’ suggesting that ensuring compliance requirements are met is a strong driving force for environmental management. The third-strongest theme relates to being able to maintain operations. The theme ‘operate’ is the third-strongest theme and it contains the concepts ‘company’ and ‘desire’, suggesting that companies have the desire to maintain operations. In terms of institutional forces, the strongest driving forces for the group sampled were all coercive. It could therefore be said that, overall, they are most responsive to coercive forces when it comes to what drives environmental management.

The large number of themes generated suggests that there are many drivers for environmental management. The environment itself did rank as a theme, however, not a strong one. This implies that there are more pressing reasons for mining organisations to manage the environment than genuine concern for its wellbeing. The fact that on the concept map theme was located away from the rest of themes also indicates that concern for the environment is not intertwined with the other drivers. Another less significant driver worth mentioning was ‘standards’. This highlights the fact that standards do play a part in the way the environment is managed. Therefore, by changing standards, the way the environment is managed can also be changed in some way (although, not as effectively as changing community pressure or regulation).
Results for each institutional order

Comparisons between the institutional orders are made after the final concept map at the end of this section.

Figure 23 shows that at the industry order, environmental professionals are the strongest internal driving force for environmental sustainability. As only one theme was generated, it could be said that the driving force from environmental professionals at this institutional order far outweighs any other internal driving force.
In reference to Figure 24, the strongest internal driving force at the corporate level was found to be management. This theme also included concepts such as recognition and compliance, which indicates that receiving management recognition and management’s interest in compliance are also driving forces. Company performance was the second strongest theme generated. This suggests that, at the corporate institutional order, the level of company performance in relation to environmental sustainability is of concern. In other words, professionals at this level are driven by their desire to see their organisations perform well. Employees rated as the third strongest theme indicating that employees do have an impact on environmental sustainability and their interests are of some importance at the corporate level.
Figure 25 shows that at the site level, maintaining compliance with regulation and necessary standards was found to be the strongest driver internally. Environmental professionals were the second strongest driver and corporate the third. This indicates that environmental professionals at mine sites have a greater influence on the way the environment is managed than their offices do. The themes do not overlap and are evenly spaced apart which indicates that the driving forces are not necessarily seen as intertwined.
As can be seen in Figure 26, at the department level, only two themes were generated for internal drivers for environmental sustainability, these being environmental professionals and management. Environmental professionals were the strongest driver, which suggests that in environmental departments at mine sites, the staff essentially drive themselves to improve environmental sustainability. Management’s influence is only secondary.
In reference to Figure 27, at the individual (or personal) level, numerous themes were generated, indicating that there are many different driving forces for individuals to improve environmental sustainability. Level of performance was found to be the strongest driver. Concern for the community in regards to how the operations were performing (or the impact of poor performance on the community) was also found to be a driving force under this theme.

Desire to achieve compliance and concern for the environment were the next-strongest themes. These were followed by the desire to change the way things are. Passion also ranked as a driving force. These emotive style themes are missing from the other institutional orders.

Table 13: Summary of internal drivers for environmental management at each of the institutional orders

<table>
<thead>
<tr>
<th>Institutional order</th>
<th>Strongest theme</th>
<th>Second strongest theme</th>
<th>Third strongest theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Environmental professionals</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Corporate</td>
<td>Management</td>
<td>Company performance</td>
<td>Employees</td>
</tr>
<tr>
<td>Site</td>
<td>Compliance</td>
<td>Environmental</td>
<td>Corporate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>professionals</td>
<td></td>
</tr>
<tr>
<td>Department</td>
<td>Environmental professionals</td>
<td>Management</td>
<td>-</td>
</tr>
<tr>
<td>Individual</td>
<td>Performance level</td>
<td>Desire</td>
<td>Environment (concern for)</td>
</tr>
</tbody>
</table>
Environmental professionals were a strong driver at the industry, site and department levels, which indicates that much of the drive to improve environmental performance within organisations comes from those employed specifically to manage the environment. The corporate level listed management as being their strongest driver which could indicate that leadership is the strongest driver at the corporate level. However, as this is not carried down through the rest of the institutional orders, it may mean that the effects of leadership do not influence the other levels of the organisations.

The strongest type of *internal* institutional forces present for the group were normative forces. Professional values and standards are types of normative forces, and in this case, they are evident in the results through the identification of environmental professionals and management as key drivers for environmental management. Coercive forces are also evident, as highlighted by the themes centring on compliance.

![Concept map for external environmental drivers at the industry institutional order](image)

*Figure 28: Concept map for external environmental drivers at the industry institutional order*

Figure 28 shows that the strongest external driver at the industry level was found to be government, followed by community and expectations. Government and community are linked, as depicted by the line between the two, however, they do not overlap. This could indicate that the government and community are not perceived as close or working together, but they do influence each other. Community and expectations are closest to each other on the map but they are not linked, unlike
government and expectations. This could mean that community expectations actually reach mining operations through the government.

![Diagram](image)

**Figure 29: Concept map for external environmental drivers at the corporate institutional order**

In Figure 29, the strongest external drivers at the corporate level were found to be regulation and government. This was followed by community and then requirements. As with the industry institutional order, community and government/regulation do not overlap but are linked (through requirements) indicating that the community does influence government and regulation but there is no evidence that they work closely together. Regulation has the strongest direct impact on the corporate level in organisations and communities influence regulation. This concept map suggests that communities have a more indirect impact on organisations than regulations do.
As can be seen in Figure 30, external expectations ranked as the greatest driver for environmental sustainability at the site level. External expectations could include the expectations of a wide range of stakeholders such as regulators, community, non-government organisations and shareholders. Compliance was the second-strongest theme. The two themes are linked but do not overlap which indicates that they are somehow related to each other but are not combined.
In reference to Figure 31, compliance requirements were the strongest external driver at the department level. Compliance was closely linked to authorities which was the third-strongest theme. Onsite leadership teams (i.e. site management) were also found to be a strong external driver (external to the department, not to the organisation). Community did rank as a driver, but not as a strongly as it did at the department level.

Table 14: Summary of external drivers for environmental management at each of the institutional orders

<table>
<thead>
<tr>
<th>Institutional order</th>
<th>Strongest theme</th>
<th>Second-strongest theme</th>
<th>Third-strongest theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Government</td>
<td>Community</td>
<td>Expectations</td>
</tr>
<tr>
<td>Corporate</td>
<td>Regulation</td>
<td>Community</td>
<td>Requirements</td>
</tr>
<tr>
<td>Site</td>
<td>External expectations</td>
<td>Compliance</td>
<td></td>
</tr>
<tr>
<td>Department</td>
<td>Compliance</td>
<td>Leadership team (site management)</td>
<td>Authorities</td>
</tr>
<tr>
<td>Individual</td>
<td>Not possible to assess</td>
<td>Not possible to assess</td>
<td>Not possible to assess</td>
</tr>
</tbody>
</table>

Note: Individuals cannot have both internal and external drivers as they are the bottom institutional order. Drivers for individuals were analysed as internal drivers.

Although government, regulation and compliance ranked the highest for external drivers at most of the institutional orders, the importance of the community cannot be overlooked. As shown in Figure 22, when the entire sample was analysed together, community was the strongest driver. The fact that it did not rank as the strongest driver for most of the institutional orders may suggest that it is actually a
primary driver or in other words, a driver of other drivers. For example, the community may be the
driver behind regulations and government requirements. However, companies have more direct
interactions with the government and legal requirements, so those are stated as stronger drivers. The
importance of the community theme may only become apparent when there is more depth to the text
and more connections and commonalities can be seen.

External expectations were listed as the strongest driver at the site level. As the sites themselves are
where the impact on the environment occurs, this is perhaps not surprising. The site level is where
operations have direct interface with the public and other stakeholders. The strongest type of external
institutional forces were coercive. At the department level, normative forces were evident in the form
of the ‘leadership team’. However, this normative influence was still not as strong as the coercive force
of ‘compliance’ at that institutional order.

4.3.4 Research Question 5: What are the restraining forces (internal and external) impacting environmental sustainability goal attainment in the industry?

Total group results

![Figure 32: Concept map for environmental restraining forces for entire group of participants](image-url)
Figure 32 depicts that for the group surveyed, the strongest restraining force for environmental management was found to be compliance. The cost of achieving compliance, the extensive compliance requirements and the ever changing nature of regulations were listed as some aspects of achieving compliance which make it difficult to improve environmental performance. Therefore, the difficulty involved in complying with requirements was itself a major barrier restraining companies from attempting to attain higher standards.

One participant stated that the greatest restraining force was ‘the lack of effective regulation, which reduces both the consequences and the trainability. It is difficult to explain to people that there are regulatory requirements that make no sense whatsoever, and basic best practice requires a thoughtful approach that may address non-regulated factors. I feel sorry for any young enviro trying to "go by the book!"’.

One of the components of the theme of compliance is government. Government was regarded as a restraining force in that government employees often had little experience in environmental management in coal mining and, as such, could not assess potential impacts or risks or suggest effective management solutions. They were also said to set unreasonable compliance limits and licence conditions.

Furthermore, the government was seen to hinder improvement in environmental management by their approach to enforcing regulation. It was suggested that the (mainly state) governments’ responses to some issues were excessive, whilst for others, nearly non-existent. The same inconsistencies were also said to occur around issues which had different environmental harm risks. Some issues which had little potential to harm the environment were of great concern to the government, whilst others with potential to cause serious environmental harm were overlooked.

Performance acceptance was the second-strongest restraining force. It relates to the acceptance of current standard practice. In other words, if companies are performing at the industry standard, there is little incentive for them to do any better. Therefore, standard practice acts like a glass ceiling on performance. The third-strongest theme for the group was business. This was meant in terms of restraining forces internal to companies. This suggests that the two strongest restraining forces were actually external and that internal restraining forces (such as culture and budgetary constraints) are insignificant in comparison. The close proximity of the themes ‘lack’ and ‘focus’ to the business theme suggests that environment may be overlooked in organisations due to more concern for other areas of the business.
With regard to institutional forces, coercive forces were again the strongest for the group. However, unlike the driving forces, not all of the strongest forces were coercive. Normative forces (in the form of performance acceptance) were also strong restraining forces.

**Results for each institutional order**

Comparisons between the institutional orders are discussed after the final concept map at the end of this section.

![Figure 33: Concept map for internal environmental restraining forces at the industry institutional order](image)

Figure 33 shows that the strongest internal restraining force at the industry level was found to be standard practice. In other words, the way things are currently done are the norm and that is difficult to change. This theme also indicates that the current standard of practice is less than desirable as if it was at a desirable standard, it would not be considered as an impeding force for improvement.

Compliance was found to be the second-strongest internal restraining force and its relatively close proximity to the standard practice theme indicates that standard practice and compliance level are not too dissimilar at this institutional order. Time was also found to be a restraining force for this institutional level indicating that time may be limited for achieving desired environmental sustainability targets.
As can be seen in Figure 34, at the corporate institutional order, compliance was found to be the strongest restraining force. In other words, compliance requirements are considered to be preventing corporate professionals from improving their organisations’ environmental sustainability. This indicates that compliance requirements are not currently sustainable in themselves (or else they would not be seen as something which is restraining sustainability), and are therefore, hindering improvement. Compliance is also considered to be a ‘glass ceiling’ by participants who claim that other people in the organisations are simply aiming to achieve that level of performance and so it is difficult to surpass it.

The second-strongest theme was resource allocation. According to participants from corporate offices, mining organisations are not allocating enough resources to environmental sustainability for them to be able to attain their desired standards. Resource allocation and compliance are linked but are not close together on the concept map. This suggests that compliance issues and resource allocation are not intertwined but they do impact each other.
In reference to Figure 35, at the site institutional order, contractors were seen to be the greatest restraining force and this theme is closely linked with the engagement theme. The two themes overlap, and this suggests that the two issues are intertwined and that engagement with contractors is a major issue preventing improvement in environmental sustainability. According to participants, there are large numbers of contractors who temporarily work onsite and are not required to meet the same standards of training as permanent employees, and therefore, do not have the understanding of their environmental impacts and obligations. In addition, they are often not held accountable for their actions because they have left the site before any issues can be raised with them.

The engagement theme also pertains to other mine site personnel in that the environmental professionals at this level find it difficult to interact and communicate their needs and concerns to everyone onsite. If people at mine sites are not aware of what they should be doing, it is difficult for them to comply with environmental standards. This makes it especially difficult to improve behaviour.
Figure 36: Concept map for internal environmental restraining forces at the department institutional order

Figure 36 indicates that time and cost were seen to be the greatest internal restraining force at the department institutional order. Time and cost is closely linked to the weakest theme generated which was resources and perhaps the two could be combined. Management was the second-strongest theme and it overlaps with the time and cost theme. This would suggest that management plays a large role in ensuring there is enough time and money to improve environmental sustainability.

The priority and production themes were also closely associated with the time and cost theme. This suggests that at mine sites, environment is not as high a priority as other areas such as production. If one looks at the concept map as a whole, it would appear that resources are allocated to other areas of operation which are considered to be a higher priority.

Table 15: Summary of internal constraining forces for environmental management at each of the institutional forces

<table>
<thead>
<tr>
<th>Institutional order</th>
<th>Strongest theme</th>
<th>Second-strongest theme</th>
<th>Third-strongest theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Standard practice</td>
<td>Compliance</td>
<td>Time</td>
</tr>
<tr>
<td>Corporate</td>
<td>Compliance</td>
<td>Resource allocation</td>
<td>-</td>
</tr>
<tr>
<td>Site</td>
<td>Contractors</td>
<td>Engagement (lack)</td>
<td>-</td>
</tr>
<tr>
<td>Department</td>
<td>Time and cost</td>
<td>Management</td>
<td>Work</td>
</tr>
<tr>
<td>Individual</td>
<td>Could not be assessed</td>
<td>Could not be assessed</td>
<td>Could not be assessed</td>
</tr>
</tbody>
</table>

Note: Internal restraining forces could not be measured for the individual institutional order as all restraining forces are external to the individual. ‘Individual’ is the lowest institutional order.
Internally, compliance itself was a restraining force in two ways. Firstly, non-environmental professionals in the industry saw compliance as the standard to be aimed for. This alone would make it difficult to improve beyond that level. Secondly, the significant resources required to achieve compliance was a major factor inhibiting the ability to improve environmental management to a standard above and beyond the level of compliance.

Time and cost were the greatest internal resource constraints. Lack of support from non-environmental professionals also ranked as an issue. In particular this lack of support was related to contractors and management, but also applied more generally. The lack of support could be said to be due to a lack of engagement with environmental concerns on the part mine site personnel and the low priority companies gave to the environment in comparison to other aspects of the business such as production. Both normative and coercive institutional forces were present internally throughout the institutional orders and they are thought to be restraining environmental management. Standard practice and management are examples of normative forces, while compliance and cost are examples of coercive forces.

![Figure 37: Concept map for external environmental restraining forces at the industry institutional order](image)

As can be seen in Figure 37, the strongest external restraining force for the industry institutional order was found to be government. The second-strongest theme was regulatory assessment. These two themes were the only ones generated, which indicates that these are the two main issues of concern.
amongst participants. Government is a large theme with many different facets. This theme was associated with issues surrounding policy inadequacies, confused staff and constant changes in government and government regulations. The ability of government to assess compliance with regulations was also judged to be unsatisfactory.

Figure 38: Concept map for external environmental restraining forces at the corporate institutional order

Figure 38 shows that compliance was again found to be a major restraining force at the corporate level. As one participant stated, ‘Regulatory models are so onerous that a lot of effort has to go into compliance and whilst these models do try to do some sustainability improvements, they often miss the mark’. Another concept in the compliance theme was interest. This was in relation to other parties such as shareholders only being interested in whether organisations are compliant or not, rather than being interested in standards which exceeded mere compliance.

Government was also found to be a constraining force at the corporate level. This theme was linked to compliance but also to the themes inexperience and requirements. This suggests that government inexperience is an issue for this institutional order, along with government requirements (similar issues to those raised for the industry institutional order).
‘New projects’ was another area of concern for those working at the corporate level. This was in regards dealing with the government and their requirements for starting up new projects. It was felt that the process of starting up new projects was difficult because of these factors.

Figure 39: Concept map for external environmental restraining forces at the site institutional order

Figure 39 depicts that the strongest restraining force at the mine site level was found to be industry perception. Participants at this level believed that because the industry has a poor public image, regulators continually add red tape to appease the public. They also believed that this red tape is often not well thought out and does not necessarily contribute to sustainability. Government and government inexperience were again considered to be strong restraining forces at this level. The issues raised are similar to those already discussed for the other institutional orders.
In reference to Figure 40, at the mine site environmental department level, environmental awareness was seen to be a major force impeding environmental management. This is in relation to workforce awareness of environmental impacts, environmental issues and environmental regulations (this is an external restraining force in that the rest of the workforce is external to the environmental department). The second-greatest restraining force theme was conditions and this pertains to unreasonable or impractical environmental licence conditions.

Leadership was the third-strongest theme. It was seen as a restraining force as participants at this level felt that there was a lack of leadership for improving environmental performance. Finally, ‘company’ was the fourth-strongest restraining force. This means that participants believed the companies they worked for did not value environmental sustainability.
Figure 41 indicates that there were numerous restraining forces generated for the individual (or personal) institutional order. The strongest was found to be cost of improving environmental management and the participants not being able to obtain funds from the organisations they worked for. Second was site support, which also closely linked to personnel and then to resources. These three themes suggest that mining professionals in the industry find it difficult to obtain support from their colleagues to improve environmental sustainability. The themes ‘acceptance’ and ‘perception’ were also generated as restraining forces and these relate to how other employees and contractors view environmental management efforts and environmental professionals.

Legislation was only seen as a weak restraining force at the individual level. This suggests that, although it is an issue, individuals have more pressing issues in their internal organisations.
Table 16: Summary of external restraining forces for each of the institutional orders

<table>
<thead>
<tr>
<th>Institutional order</th>
<th>Strongest theme</th>
<th>Second-strongest theme</th>
<th>Third-strongest theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Government</td>
<td>Regulatory assessment (poor regulations and poor regulation)</td>
<td>-</td>
</tr>
<tr>
<td>Corporate</td>
<td>Compliance</td>
<td>Government</td>
<td>New projects</td>
</tr>
<tr>
<td>Site</td>
<td>Industry perception</td>
<td>Government experience (level)</td>
<td>Government</td>
</tr>
<tr>
<td>Department</td>
<td>Environmental awareness</td>
<td>Conditions (licence)</td>
<td>Leadership</td>
</tr>
<tr>
<td>Individual</td>
<td>Cost</td>
<td>Site support</td>
<td>Personnel</td>
</tr>
</tbody>
</table>

Most external restraining forces centre around the government and compliance. The higher institutional levels are more affected by the regulatory framework and government as a whole, whereas the lower institutional orders are more affected by day-to-day issues such as operational licence conditions and the individual qualities of government personnel that they deal with (i.e. lack of experience). It should be noted that some of the external and individual restraining forces are still internal to the companies that they work for. For example, environmental awareness refers to the environmental awareness of those outside of the participants’ departments in their companies, and site support refers to support from company employees. Leadership refers to leadership in their organisations. At each of the institutional levels the predominant external restraining forces were coercive institutional forces. This suggests that normative and mimetic forces are not strong external restraining forces.

4.3.5 Research Question 6: What is the institutional logic for environmental management in the industry?

This question could be rephrased as: ‘why do people in the industry respond to the various driving and restraining forces present?’ What is their underlying logic for taking action? Logic differs from driving and restraining forces as the forces are simply the things niggling at people and their organisations and willing them to act. Whether they act or not, and why they do so, depends on logic.
Results for total group

The concept map for institutional logic for the total sample (Figure 42) shows that the logic behind why companies respond to particular driving and restraining forces is essentially the desire to maintain their licence to operate. This is shown by the strongest theme being ‘operate’ and the concepts contained the theme being ‘maintain’ and ‘licence’. The concept ‘social’ is also encompassed in the ‘operate’ theme suggesting that companies acknowledge their need for a social licence to operate. As one participant stated ‘In my role specifically and within the environmental department, I feel as though the main logic is achieving the required conditions set out in our environmental licence that allow the mine to operate’.

The second-strongest theme, ‘environment’, centres around concern for the environment and future generations. As was the case with the overarching environmental target, there is a genuine desire to reduce the impacts of the operations on the environment, but it is not the number one priority. The third-strongest theme is ‘performance’. This relates to achieving a level of environmental performance that is acceptable in the industry. The theme ‘operate’ overlapped with ‘environment’ and ‘compliance’, suggesting that mining organisations consider the three things as somewhat intertwined. In other words, maintaining a licence to operate is linked to complying with regulations and managing impacts on the environment. The fact that numerous themes were generated indicates that
institutional logic is somewhat complex (if not many themes were generated this would indicate that the logic was straightforward).

**Results for each institutional order**

Comparisons between the institutional orders are made after the final concept map at the end of this section.

![Concept map for environmental institutional logic at the industry institutional order](image)

**Figure 43: Concept map for environmental institutional logic at the industry institutional order**

In reference to Figure 43, the industry institutional logic highlighted numerous different motives for managing the environment. Attention from the regulator was number one. This pertains to the desire to avoid negative attention. This theme is also connected to two weaker themes ‘outcomes’ and ‘bad’ which suggests that participants from this level act the way they do in order to prevent bad outcomes which may result from adverse regulator attention.

‘Requirements’ was the second-strongest theme. This theme relates to doing what is necessary to fulfil the regulatory requirements. Participants also listed the desire to receive favourable licence conditions as a reason for acting the way they did in regards to environmental management. Concern for the environment itself and future generations did not rank highly at this institutional order, even though they were recognised as themes which suggests that there is genuine concern for these issues, but this concern not as great as it is for the other themes.
Figure 44 illustrates that the strongest motive for managing the environment at the corporate level was found to be maintaining a licence to operate. This was closely associated with compliance, regulatory requirements, reputation, business and company. Environment itself was the second-strongest theme overall. However, considering that the majority of the other themes do not necessarily support concern for the environment (i.e. they are ulterior motives), it could not be said that care for the environment is the major focus for this institutional order.
As can be seen in Figure 45, participants from the mine site level indicated that there is one main reason for managing the environment the way they do – to maintain their licence to operate. This was the only theme generated for this institutional order.
In reference to Figure 46, the most common logic for managing the environment at the department level was found to be the need to ensure the mine keeps operating, complies with regulations and does not receive negative attention from stakeholders. The second-strongest theme centred around the desire for the participants’ organisations to receive some sort of financial returns for the work they do, for example by allowing the operations to generate profit by maintaining their licence to operate or by creating monetary returns from selling waste or operating more efficiently. Again, concern for reducing harm and the future were only generated as secondary themes. However, they were still generated as themes which indicate genuine concern.
Figure 47 indicates that the major common individual (or personal) motive for managing the environment was found to be positive environmental outcomes. Participants saw that if there were good environmental outcomes (in regards to both organisational environmental performance and reduction in environmental harm), it would benefit them. They would get the satisfaction of fulfilling their job requirements and also gain personal satisfaction.

Concern for the environment was the second-strongest theme, indicating that the environmental professionals who took part in this study do have a real desire to protect the environment and improve organisational sustainability. Receiving a company bonus also ranked as a motivating force for managing the environment, however this was not one of the strongest themes.

Table 17: Summary of themes in logic for responding to environmental management forces for each institutional order

<table>
<thead>
<tr>
<th>Institutional order</th>
<th>Strongest theme</th>
<th>Second strongest theme</th>
<th>Third strongest theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Attention from regulator (negative)</td>
<td>Requirements</td>
<td>Favourable licence conditions (obtaining)</td>
</tr>
<tr>
<td>Corporate</td>
<td>Licence (to operate)</td>
<td>Environment (concern for)</td>
<td>Compliance</td>
</tr>
<tr>
<td>Site</td>
<td>Licence to operate</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Department</td>
<td>Feel compelled</td>
<td>Returns</td>
<td>Future</td>
</tr>
<tr>
<td>Individual</td>
<td>Positive environmental outcomes</td>
<td>Environment (concern for)</td>
<td>Goal (achievement)</td>
</tr>
</tbody>
</table>
4.3.7 Summary of key findings from Phase 2 of the research

Below is a diagrammatic summary of the force field analysis findings for the group surveyed.

Figure 48: Force field analysis results for improving environmental sustainability in the industry

The key findings from the questionnaire were that in practice:

1. Mining organisations are aiming to achieve slightly more than compliance with regulation (but not any of the three higher sustainability performance levels).
2. Mining organisations are currently achieving their target of performing at just above the compliance level.
3. The strongest driving force for environmental management in the industry is community.
   Community is the primary driver behind environmental regulatory requirements which directly impact operations. The community itself generally indirectly impacts organisations.
4. The strongest restraining force hindering the achievement of the overarching environmental target in the industry is the compliance requirements themselves (poor regulatory framework).
   Note that this is an external force rather than one internal to the organisations.
5. The institutional logic behind why the industry manages the environment the way it does is to ensure operations maintain their licences to operate.
4.4 Research Phase 3 In-depth interview results

4.4.1 Research Question 7: What would need to happen in the industry for it to reach its overarching environmental sustainability goal?

**Interview Question 1:** How could regulations be improved to ensure companies are continually improving and becoming more sustainable?

![Figure 49: Concept map for interview question pertaining to how environmental regulation could be improved](image)

Figure 49 shows that this question only generated two themes. The strongest theme was centred around regulations being easier to understand. Participants claimed that the current environmental regulations are confusing and excessive. One interviewee stated ‘Environmental regulation is too difficult to decipher. It needs to be more to the point so that people spend less time trying to interpret it and more time protecting the environment’.

Participants believed that it is too difficult to understand exactly what is required of them. Because of this, they found it difficult to meet the regulatory requirements. They suggested that the regulations could be more effective if they were more direct and comprehensible. The second-strongest theme for this question related to the environmental approvals process for new mining operations. Those interviewed voiced their concern over the current approvals process, saying that to gain approval, companies basically needed to ‘jump through all the hoops’ and make sure all of the ‘boxes are ticked’
in the application process rather than having the government assess each application individually and giving approval conditions suited to the specific proposed operations.

Participants claimed that the types of licence conditions they are likely to receive are pre-determined by the regulator before proponents even lodge their applications. However, they still have to complete all of the stages in the approvals process and spend large amounts of money to obtain approval. Participants told of mining projects that had taken over four years and cost millions of dollars to be approved, yet the licences they ended up with were standard, predictable and the same as everybody else’s. They said that all of that time and money could have been spent on measures to actually protect the environment.

Some interviewees said that the approvals process could be streamlined and improved by providing proponents with the set of licence conditions that their operation would need to comply with at the beginning of the approvals process and then asking them to demonstrate how they would comply before giving the final go-ahead for the project. Of course, the mining companies would still have to conduct their own comprehensive environmental impact assessments to establish what ecosystems needed to be managed and how to meet their licence conditions.

In summary, the interviewees said that environmental regulations in mining could be improved by making the requirements easier to understand and by streamlining the approvals process. The clear separation of the two themes on the concept map indicates that they are not linked (i.e. that the approvals process needs to be clearer).
**Interview Question 2:** How could achieving compliance be made easier for coal mining companies so that they can be more sustainable?

The results for this question (Figure 50) suggest that the best way to make achieving compliance easier is to improve the regulators’ knowledge of environmental issues affecting mining operations (strongest theme). Those interviewed felt that if the regulators had a better understanding of the issues, they could set more achievable conditions, provide effective guidance to companies and respond to issues in a practical manner.

The second-strongest theme for making compliance easier to achieve was making the regulatory requirements more practical. Participants said the current requirements were impractical for everyday mining operations, and therefore, very difficult to achieve. One example of this was unrealistic water release licence conditions which were impossible to comply with because they were not based on scientific data. Another example was having excessive conditions around activities that had very little potential to cause environmental harm. It was assumed by some participants that the impractical legislative requirements arose partly from political agendas rather than scientific need.

The third-strongest theme again pertained to the regulators. It was the suggestion that regulators should spend more time on mine sites to improve their level of experience. In doing so, their working
knowledge of operations and the environmental issues facing them on the ground would be enhanced and this would make them more practical regulators.

**Interview Question 3:** How could regulations be improved to reduce the amount of change that occurs to them (which organisations have difficulty keeping up to date with)?

![Concept map](image)

*Figure 51: Concept map for interview question pertaining to how the amount of change in regulation could be reduced*  

In reference to Figure 51, in order to reduce the amount of change that occurs to regulations (which organisations have difficulty keeping up with), participants indicated that the regulations should be more scientifically based (strongest theme). They felt that current policies and regulations were more politically driven and therefore prone to regular change depending on what was the topic of interest at the time.

One interviewee stated that regulators should 'base regulation on actual environmental harm, rather than whatever there is outrage about on a given day'. The participants argued that if the regulation was scientifically based on what environmental harm the operations could actually cause, there would be no need to change it as the potential impacts would remain the same throughout the life of the mines.

The second-most frequently suggested way of reducing the amount of change in environmental regulation was to increase the amount of communication between the regulators and mining companies. For example, this could be done by sending out regular newsletters or updates on what was
happening in government policy. If the government provided more information on what was happening internally, industry could discuss any potential issues or impracticalities. By doing so, more effective and practical regulations could be developed in the first place, meaning that they would require less change or improvements when they were implemented.

The distance between the two themes and their complete segregation on the concept map indicate that they are independent of one another. They are separate recommendations requiring different actions. The fact that only two themes were generated suggests that reducing the amount of change could be a straightforward process.

**Interview Question 4:** How could regulations be improved to ensure that the amount of regulation and associated penalties match the severity of the potential environmental harm?

![Figure 52: Concept map for interview question pertaining to penalties matching environmental harm](image)

As can be seen in Figure 52, interviewees claimed that regulations would need to be more scientifically based (strongest theme) if they were to match the level of environmental harm to the stringency of the licence conditions and the penalties for non-compliance. Participants stated that scientific evidence of how much harm is likely to be caused is measurable and reliable. Conversely, according to those interviewed, current regulations are politically motivated which makes the requirements disproportionate to the amount of actual environmental harm caused.
The second-strongest suggestion by participants for making the regulations more proportionate to severity of environmental harm caused was to make the aim of the licence conditions to continually reduce environmental harm. For example, if the onus was on the companies to demonstrate how they planned to continually reduce their environmental footprint instead of simply meeting their licence conditions, companies would need to focus their resources on what actually causes harm rather than meet conditions that may be politically driven.

The third-strongest theme was directed at the regulators, suggesting that they should have a better understanding of what causes environmental harm. If that were the case, suitable levels of attention could be given to different issues depending on their severity in regards to environmental harm. Interviewees stated that when regulators were unable to discern what a serious issue is and what is not, they are likely to respond with impractical advice and unrealistic expectations.

There was no overlapping of the themes, indicating that each of the suggestions was raised separately and independently of the others.

**Interview Question 5:** How could interaction with the government be improved so that mining operations are not being governed by inexperienced personnel?

![Figure 53: Concept map for interview question pertaining to how mining operations could be governed by more experienced regulators](image-url)
Figure 53 shows that there were only two themes generated for this question, indicating that there is a clear way to move forward (i.e. by addressing only two things rather than many). The first was in regards to the regulators and mining companies working more collaboratively in order to help inexperienced regulators to become more experienced. Those that took part in the interviews recognised the benefits of the two parties being more open and willing to work though issues together, rather than working in different directions and behind closed doors.

The participants suggested that, if there was more collaboration between mining companies and regulators, the sum of the experience of all the people working on issues could be utilised and therefore more beneficial outcomes achieved. There would be a better understanding of what the needs were on each side and solutions benefiting both parties could be developed. If environmental regulators and miners worked together, everyone involved could be learning and developing their professional capabilities.

The participants also noted, however, that there was risk involved in mining companies being more open with the regulators because they would be at risk of litigation if the regulators did not approve of the approaches mining companies were taking on particular issues. This risk could lead to reluctance on the part of the mining companies to work more collaboratively with the regulators. This issue would therefore require addressing if this approach were to be taken seriously in future.

One participant said that ‘If mining companies opened their doors to the regulators, there would be a greater risk of them being prosecuted as all of their issues would be in plain view, but worse than this, is the risk of being governed by poor regulators’. This statement suggests that the downside of working more collaboratively with the regulators would be far outweighed by the benefits. Another way in which collaboration could enable mining companies to deal with more experienced government personnel would be to increase the salaries of the regulators. Participants discussed the issue of government workers getting paid much less than mining company employees and therefore leaving to work for mining companies. If there was collaboration on how the issue of differences in pay could be resolved, perhaps the government could retain more experienced personnel.

The second theme identified from the analysis of data for this question was in relation to regulators spending more time onsite at mining operations. This was also suggested in response to Question 2. (how to make achieving compliance easier for mining organisations). By doing so, they could become more experienced and therefore more practical in their approaches to regulating mines. Again, such a proposal would require support from both parties and mining operations would need to be willing to open their doors to the regulators.
**Interview Question 6:** How could the industry go about changing regulations?

Figure 54 indicates that, when the interviewees were asked how the industry would go about changing regulations if it could see a way to improve them, the response was almost unanimously through the use of industry bodies (the strongest theme). Such industry bodies included national organisations like the Minerals Council of Australia and state organisations such as the Queensland Resources Council. It was noted that the use of industry bodies as a means of lobbying the government was already common practice amongst mining companies.

Another suggestion for how to go about changing regulation was through more direct government interaction (the second theme). If mining companies and regulators had more direct interaction, there would be better communication and understanding of what regulations needed to change from each other’s perspective and why. Of course, this finding indicates that there is currently not enough interaction between the government and coal mining companies. More interaction/communication between the regulators and mining companies was also suggested in response to Question 3 (how to reduce the amount of change in regulation). Having the same theme occur in more than one question indicates a clear need for action in the area.

The two themes generated did not overlap, indicating that they could be targeted independently to bring about changes in regulations. In other words, the use of industry bodies could bring about change
or more company-government interaction or both could be actioned independently and at the same time to create change.

**Interview Question 7**: Why isn’t the target for environmental management in the industry set higher than it currently is (i.e. just above compliance)?

![Figure 55: Concept map for interview question pertaining to why the overarching environmental target is not set higher](image)

In reference to Figure 55, participants responded to the question of why the overarching environmental target was not set higher than it currently is (which is just above compliance level according to the questionnaire results) with the themes of profitability (the strongest theme) and the fact that mining companies are businesses (the second-strongest theme). Interviewees stated that for mining companies to voluntarily go beyond environmental compliance costs money. They said that companies would be reluctant to do so because that would mean a reduction in profit.

One participant alleged that ‘Environment is seen as a non-value adding cost by senior management. They won’t spend money on any such thing.’ This allegation has major practical implications for if and how coal mining companies are to become sustaining organisations and these implications are discussed in Chapter 5. Environmental awareness was the third-strongest theme generated from the interview responses. Participants suggested that if mining company employees were more aware of their impacts on the environment, they would be inclined to reduce their impact and become more sustainable. This finding implies that there is currently limited environmental awareness and, as such,
less desire to protect the environment and less knowledge about how to do so. The environmental
awareness theme was not connected to the other two themes on the concept map. This suggests that
environmental awareness is a separate issue to profit and business. This suggests that it needs to be
addressed separately if it is to be effectively managed.

**Interview Question 8:** What could be done to lift the standard of practice that is widely accepted for environmental management in the industry?

![Concept map](image)

As can be seen in Figure 56, interviewees claimed that the current standard of practice had much to do with the regulator (the strongest theme). This is perhaps not surprising given the current environmental performance level for mining companies is just above compliance (according to the results from the questionnaire). This suggests that the standard of practice is unlikely to improve unless the regulator sets higher standards. Participants said that one way in which regulators could improve the standard of practice would be to offer more incentives for companies to go above and beyond compliance. For example, financial incentives which would actually enable organisations to increase their profits by reducing environmental harm (such as solar power rebates or carbon credit schemes).

Those interviewed also acknowledged the role that senior management has to play in improving the standard of practice for environmental management (the second-strongest theme). They indicated that there needs to be some leadership on the issue internally in mining organisations. If senior
management rejected the current standard of practice and proclaimed that it was not good enough, everybody else in the organisations would be more inclined to take action. The two themes were not connected on the concept map. This suggests that there are two separate target areas for improvement. Senior management could be targeted to see improvements, or the regulators could, or both. Each requires specific and specialised attention to bring about improvements.

4.4.2 Summary of key findings from Research Phase 3

In summary, the following list of actions was generated from the interviews as ways for the industry to become more environmentally sustainable (which pertains to Research Question 7):

1. Take steps to ensure environmental regulations are clearer to understand so that mining operations can easily identify exactly what is required of them.
2. Make regulations more scientifically and less politically based (i.e. they should be based on what actually causes environmental harm rather than any political agenda).
3. Develop regulations that provide financial incentives for mining companies to become more sustainable (thus enabling companies to maintain or even increase their profit margins whilst reducing their environmental footprint).
4. Develop regulations that require mining operations to demonstrate continual improvement in regards to reducing their environmental harm.
5. Streamline the approvals process by giving mining companies likely licence conditions upfront and asking them to demonstrate how they will comply with them.
6. Improve regulators’ knowledge of mining operations and their environmental impacts by enabling them to spend more time on mine sites and by increasing the amount of direct communication and collaboration between mining companies and regulators.
7. Utilise industry bodies such as the Minerals Council of Australia or state resource councils to drive any desired change in regulations.
8. Improve awareness across the industry of operational environmental impacts to increase the desire to protect the environment.
9. Increase the level of senior management leadership within mining organisations with regard to improving standards of environmental management.

4.5 Summary

This chapter presented the results and analysis from each phase of the research. The key findings from each research phase can be summarised as:
Table 18: Summary of key findings from the three phases of research

<table>
<thead>
<tr>
<th>Research phase</th>
<th>Pertaining to</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The espoused environmental sustainability performance level.</td>
<td>Organisations are aiming to become sustaining organisations (the highest performance level on the performance scale).</td>
</tr>
</tbody>
</table>
| 2              | What organisations are aiming for in practice, how they are currently performing, what is driving and restraining improvement, what the institutional logic is for managing the environment within the organisations. | In practice, organisations are:  
  • aiming to perform at a level three stages below the sustaining organisation level (compliance).  
  • performing at the level they are aiming for in practice (compliance).  
  • most driven to improve by the community (which directly impacts organisations in the form of regulation).  
  • restrained from improving the most by regulation.  
  • ensuring operations maintain their licences to operate is the motive for managing the environment. |
| 3              | Actions that can be taken to improve organisational environmental sustainability in the industry. | A set of nine key actions, mainly centring on improvement to regulation and regulators, but also improving organisational leadership and environmental awareness across the industry. |

The findings in this chapter have significant implications for the industry, its stakeholders and organisations outside of the industry who wish to align their environmental sustainability policies with their practices. These implications are discussed in detail in the following chapter.
Chapter 5 Conclusions and Implications

5.1 Introduction
This chapter initially discusses all of the findings in relation to the research questions and the existing literature. The implications of the findings for practice and theory are then highlighted before a discussion of the limitations of the research. Recommendations for further research are then made, prior to a summary of the entire study. The layout of the chapter is shown in Figure 57.

5.2 Discussion
5.2.1 Research Question 1: What is the planned overarching environmental sustainability goal (policy) for the industry?

The results found in Phase 1 of the research are consistent with both the claims made on mining company websites and previous studies on mining sustainability communication. Organisations are aiming towards environmental sustainability and contributing to sustainable development (Nilsson et al. 2013). This research phase analysed the website material on a deeper level. The automated text
mining tool Leximancer searched for deeper meanings and less obvious themes in the language used. This is in contrast to the review of websites undertaken in the literature review stage, in which the sustainability statements made by companies were taken at face value.

This deeper analysis found that coal mining companies are claiming that they aim to become environmentally sustainable. In the context of the sustainability scale adopted for this study, developed by Dunphy et al. (2003), the environmental aims of organisations in the industry are at the highest level – the sustaining organisation level. The sustaining organisation level is three levels higher (out of a scale of six levels) than the compliance level which is currently being achieved in practice. Given that the first step in any planned change management effort is to set the target for the desired change (Kotter 1996; Lewin 1951; Palmer et al. 2006; Wood et al. 2006), the industry has taken the first step in achieving its objective. It should also be noted that the industry did not necessarily have to set the target so high. Achieving sustainability is by no means an easy feat (Benn et al. 2012; Doppelt 2010; Dunphy et al. 2007; Husser et al. 2012; Jenkins & Yakovleva 2006; Li 2006; Lozano 2012; Metcalf & Benn 2013; Whitmore 2006). Whether or not there are hidden agendas for the industry setting its sights so high, the fact is that operating sustainably is where the target has been set.

The question needs to be asked whether coal mining organisations actually understand what they are aiming for in policy. Confusion around what organisational sustainability looks like is common for corporations (Husser et al. 2012; Jenkins & Yakovleva 2006). It would therefore not be impossible that companies in the industry do not know what it is they are claiming to aim for. Perhaps, as in other organisations outside of the industry, the mining companies only state that they are striving to be sustainable because they see it as the ‘correct’ or socially acceptable term to use and one that will appease their stakeholders (Benn et al. 2010; Matejek & Gössling 2013).

5.2.2 Research Question 2: In practice, what is the overarching environmental sustainability goal for the industry?

The results indicate that compliance was the most commonly cited target, followed by concerns around impact reduction. This suggests that, overall, the organisations in the industry have the aim of achieving compliance as a priority. However, this is not the sole aim and there is genuine desire for impact reduction (as supported by the full survey response surrounding the term ‘impact’). The aspiration to achieve more than just compliance is also highlighted by theme ‘sustainable’ (in the context of mining companies aiming to have sustainable operations) which is the fourth-strongest theme.

As the target sits just above compliance on the sustainability scale (and below the efficiency stage), it is apparent that in general, coal mining companies are not aiming to become sustainable corporations
(sustainable corporations is the last stage on the sustainability scale). This simply means that, until the overarching goal is to be sustaining corporations, companies are unlikely to reach that level of performance. Unless companies have a clear vision about how they are going to perform, they will not perform at that level (Beaver 2000).

When compared with the findings of Phase 1 of the research, it is obvious that there is a discrepancy between the actual environmental management targets and those stated on the web pages of Australian coal mining companies. The information on the web pages pertains to companies having sustainability as their number one priority for environmental management, whereas the results of the second phase of research indicate compliance is the number one priority.

One thing worth noting is that mining organisations may sincerely do not know the difference between what a sustainable organisation is and what an organisation operating at the compliance level is. It is well documented that there is confusion around what sustainability actually is (Bell & Morse 2008; Dyllick & Hockerts 2002). Therefore, it would not be too much of an extrapolation to suggest that perhaps organisations may assume that achieving compliance is operating sustainably. Such a difference between espoused and in-practice targets has been observed before in the broader context of corporate social responsibility in the Australian mining industry. This suggests that the issue may be widespread across all mining industries (i.e. iron-ore, gas, coal etc.) and all aspects of corporate social responsibility (i.e. environment, social, economic). Bice (2013) accounted for a difference in corporate community impact targets and actual practice with the view that remote mining operations are strongly affected by their local pressures and therefore do not conform to corporate policy. Jones (2007) found that in Rio Tinto and BHP, the inclusion of corporate social responsibility items in mineworker employment contracts was not enough to ensure action in those areas on the ground.

The discrepancy found in this study does raise the question of whether coal mining companies are serious about becoming sustainable and whether their website targets are genuine commitments. Corporate social responsibility initiatives conducted by companies have often been viewed as public relations exercises rather than sincere attempts to act responsibly (Benn et al. 2010). They have commonly been seen as efforts to repair reputations or increase brand value rather than commitments to more responsible corporate behaviour (Waldman & Siegel 2008).

In the oil industry, BP is the classic example of a company which publicly pledges its commitment to the environment, but whose performance on the ground tells a very different story. Prior to the Deepwater Horizon catastrophe in 2010, BP was highly regarded as a company that respected the environment and took all possible steps to reduce its footprint. This reputation has been attributed to the ‘green
narrative’ that the company used in any engagement with the public. The public essentially began to believe the story that the company was telling rather than what was happening behind the scenes at their operations (Matejek & Gössling 2013).

Since the catastrophe, BP has found itself dismissed as a corporate greenwasher (Matejek & Gössling 2013). The general public has lost its trust in the company. This is the risk that organisations in the Australian coal mining industry run if they do not align their publicly stated environmental ambitions with what they are actually aiming for. They risk being saddled with poor reputations, limited stakeholder confidence and being seen as bad corporate social citizens. This leads to a reduction in profits, more regulation and even bigger challenges to running successful businesses. It is worth noting that coal mining organisations are not necessarily claiming to be sustainable yet. In fact, according to a study completed by Nilsson et al. (2013), mining companies tend to emphasise that sustainability is a process. They say that they are on a journey towards sustainability and that one day that’s where they hope to be.

The targets at the higher institutional levels (industry and corporate) were more expansive and broad (this is perhaps more evident when viewing the concept maps for each of the institutional orders in the appendices). The higher institutional orders also had greater focus on reducing harm and becoming more sustainable. Lower institutional levels had a narrower focus that was based around maintaining compliance. These results suggest that the higher institutional orders are looking at the bigger picture and strategising the broader direction of the industry and corporations. They also suggest that this leadership and vision is lost further down the institutional orders. In other words, the more sustainable targets are at the higher institutional levels but these are lost by the time they reach the operations where the actual environmental harm takes place.

Leadership is essential for any organisation wishing to reduce their environmental impact and become more sustainable (Benn et al. 2006; Doppelt 2010; Hoffman 2010; Lozano 2012). This study found that although company policies and websites state that organisations are aiming to become sustainable, there is a clear lack of leadership within the organisations to achieve this. The change management literature is laden with studies stressing the importance of effective leadership. If there is a lack of sustainable leadership at the operational levels of an institution, corporations cannot become sustainable (Doppelt 2010). This means that company environmental strategy has to be taken from the top of the organisation to the bottom through leadership. If leadership is missing at any of the levels, the company will not fulfil its strategy objectives (DeChurch et al. 2010; Stoughton & Ludema 2012).
The fact that numerous themes became evident when asked about what the target was in practice suggests that there is no one clear vision for companies on the ground. This also presents a problem in terms of planned change management. As authors such as Kotter (1996) and Palmer et. al (2006) point out, a clear vision is imperative for any organisation when there is a desire for a particular change. A lack of vision means a lack of leadership and therefore a lack of direction (Gill 2002). Having numerous, unclear and uncertain targets can be confusing for the workforce and can lead to lack of action (Pearce & Sims 2002).

One way of providing clear vision regarding environmental targets for organisations within the industry is to have effective environmental policies (Benn et al. 2012). The policies should be concise with good visual impact and should include the following in order to be effective: policy statement, scope, definitions, policy details, links to related documents, endorsement details and a contact person. In addition, the policy needs to be reviewed regularly to ensure its relevancy (Benn et al. 2012).

5.2.3 Research Question 3: What is the current level of environmental performance in the industry?

Mining organisations in the industry (and all institutional orders within it) are currently performing at a level somewhere between ‘compliance’ and ‘efficiency’ along the sustainability scale. This is also the level at which they were found to be aiming for in practice, it could be said that mining companies are already achieving their in-practice environmental sustainability targets. This may mean that there is no ‘felt need’ to improve internally in the organisations. Lewin (1946), as part of his action research work, suggested that for people to want to change, they must feel the need to change or have a desire to change. If not, the change will not occur (Burnes 2004a). Therefore, if employees of the mining companies do not feel the need to become more sustainable than they currently are, it will be very difficult for the organisations to achieve their espoused sustainability targets.

As the organisations have not yet completely reached the efficiency stage, they would still be classed as performing at the compliance stage. According to Dunphy et al. (2007, p.25), organisational compliance focuses on reducing the risk of sanctions for failing to meet minimum standards as an employer or producer. In organisations at the compliance stage, the dominant elite emphasises being a ‘decent employer and corporate citizen’ by ensuring a safe, healthy workplace and avoiding environmental abuses that could lead to litigation or strong community action directed towards the firm. However, they are primarily reactive to growing legal requirements and community expectations for sustainable practices.
At the compliance stage, financial and technological factors still dominate business strategies but senior management seeks to comply with environmental laws and minimise the firm’s potential liabilities from actions that might have an adverse impact on the environment. The most obvious environmental abuses are eliminated (the ones that could lead to litigation or strong community action against the firm), but the rest are ignored (Dunphy et al. 2007).

Kemp et al. (2012) suggest that the current audit culture amongst all the different mining industries could lead to mining organisations only performing at the compliance level. Audits are conducted to assess how mining organisations are performing in regards to environmental management. As the assessment criteria for these audits tend to be related to compliance with specific guidelines, compliance tends to be the goal. Mining companies associate good environmental performance with clean audit reports. Therefore, there is little incentive for them to aim for more than compliance because it will not get recognised in the audits.

The actual performance levels found in this study are considerably lower than the targets stated on mining company web pages. Such results indicate a discrepancy between desired performance and actual performance. However, as the findings of the questionnaire indicate that mining companies are not actually aiming to achieve what is on their websites, and are instead aiming for just better than compliance, it appears as though they are already achieving what they are aiming for on the ground.

There is existing literature on how organisations can move past the stage of compliance if that is their desire. Dunphy et al. (2007) suggest that doing so requires employee commitment. It needs effective management of the ‘soft’ organisational variables (in addition to having the ‘hard’ variables such as policies and technical systems in place which are most likely already in place at the compliance level). It needs the people side of organisations to be effective. It is essential to align espoused intentions with in-practice actions (McLaren 2011; Zona 2009). The use of strategic human resource management systems and plans is one way of combining all of these factors and has already been demonstrated in the mining industry for other areas of business (Dickie & Dwyer 2011; Zheng et al. 2007).

Moving past the compliance stage requires the hearts and minds of the organisational workforce to be striving for the common goal of becoming more sustainable (Dunphy et al. 2007). It requires cultural and attitudinal change and it requires organisations to be learning organisations so that sustainable organisational systems, norms and values can be embedded (Benn et al. 2013). These are the sorts of things that need to be considered if mining organisations are serious about becoming sustainable organisations. It is worth noting that these suggestions are generalised and not specific to the coal
mining industry, however. Industry-specific actions are suggested later in this chapter in response to Research Question 7.

Institutional theory has been used in the existing literature as a means of explaining why organisations ‘do more than they have to’ when it comes to environmental management (Delmas & Toffel 2004; Hoffman 1999; Liu et al. 2010). However, as the coal mining industry is not performing at any of the levels above compliance, this study cannot support or reject the explanations provided. Social licence to operate has also been used throughout the literature to explain why companies go above and beyond compliance (Prno & Slocombe 2012). Given the industry’s performance level, it could be said that perhaps the coal mining organisations do not have to do much on top of their legal requirements in order to obtain their social licence to operate.

Another perspective would be that perhaps communities have a large indirect influence on coal mining organisations. Perhaps the communities influence operations through the regulators and regulations (as the findings of this study support for the area of environmental sustainability). If this is the case, organisations still need to appease the demands of their communities in order to operate, and their social licence to operate is simply encompassed in their legal licence to operate.

5.2.4 Research Question 4: What are the drivers (internal and external) for achieving the environmental sustainability goal in the industry?

The strongest driver for improving environmental management in this study was found to be communities. This finding supports the literature which highlights the growing realisation of the importance of communities as drivers for corporate sustainability (Bendell 2009). It also reaffirms the claims of studies which acknowledge the increasing role communities are playing in corporate governance (Benn & Dunphy 2007; Brammer et al. 2012).

This study found, however, that there is more than one level of change drivers. Communities were found to be the biggest overall driver for the group surveyed and, as such, they were named as the primary driver for improvement in environmental management in the industry. When the sample was broken down into its institutional levels, though, compliance and regulation were found to be the biggest drivers. These were classed as secondary drivers for change and it was assumed that because there is more direct interaction of coal miners with the regulators and regulation than with the community, they appear to be the strongest drivers on a day-to-day basis. Behind the regulation, though, is the community driving it with their demands. The community interaction is simply not as direct.
Irrespective of whether drivers for environmental improvement in the industry are primary or secondary, it is apparent from this study that organisations are still most responsive to coercive forces. There is a large volume of literature which claims that many organisations are now acting voluntarily to improve their environmental performance (Stoughton & Ludema 2012). This cannot said to be the case for the Australian coal mining industry. The fact that the industry is most responsive to coercive forces would suggest that their environmental management efforts are implicit rather than explicit according to Matten and Moon (2008). In other words, it would suggest that the industry is more reactive to environmental management pressures rather than proactive.

It is not understood whether communities impacted by coal mines currently understand their power. Nor is it known whether they understand that they play an important governing role in the way companies operate or that they are an active player in corporate governance. They could simply assume that their voice is too weak to stand up against mining giants and, as such, feel hopeless in their efforts to achieve change. Kemp (2010), acknowledges the difficulties associated with community consultation for mining companies. She identifies three common issues which hinder good community relations – communities assuming that the mining organisations are simply engaging with the community as a public relations exercise, the absence of any way for communities to change things internally in organisations (such as playing a part in decision-making or being able to influence culture) and the absence of a place for communities in the management systems which guide mining operations.

Perhaps one of the issues in mining company–community engagement is that there is no platform for communities to directly state what they expect from companies. There is no way for communities to state exactly what they will accept in terms of environmental management. Or perhaps the issue is that they don’t know what they want. Either way, in the current situation, it may be hard for mining companies to know what they are aiming for in regards to their social licence to operate because they are not directly hearing specific or measurable demands from the public. Instead, they respond to the loud, clear and explicitly stated regulatory requirements.

There are some instances in other mining industries where communities have stated clearly what they are demanding. For example, in the coal seam gas industry, some landholders are clearly stating via the media that they do not want any coal seam gas mining on their properties. They are also stipulating how gas wells and pipelines are to be managed by the companies when they enter their properties through individual compensation agreements (Prno & Slocombe 2012).
The coal mining industry has much less direct interaction with its communities as the mine sites are usually located on land owned or leased by the mining companies. On account of the safety implications of having the general public wandering around mine sites where there is large machinery and excavations, there is usually clear segregation between the mine sites and surrounding lands, and trespassing is a serious offence. This means that unlike the coal seam gas industry, mining companies do not need to consult communities about activities conducted on their mine sites and they do not need permission to undertake certain activities.

One possible option for enabling communities to be more involved in environmental management at mine sites is to engage them to conduct environmental audits. As suggested by Kemp et al. (2012), community-led audits would provide the platform for mining companies and communities to directly interface over environmental matters. The communities could gain an appreciation of the pressures and constraints that mining organisations have contend with and mining organisations could gain an understanding of what is important to their communities and why. Kemp et al. (2012) acknowledges a couple of potential issues associated with community-led audits. The selected community members must have a high level of ‘capacity’ and be knowledgeable about environmental issues. In addition, the community members involved in the process need to be constructive and work to bring about positive change.

Initiatives such as community-led audits would allow communities to engage with more employees at the mine sites. According to McDonald and Young (2012), it is the employee–stakeholder relationships which make cross-sector collaboration successful. The more employees there are involved with the community, the more supportive they will be of community needs and the more willing they will be to listen to community concerns. Such an approach differs from the traditional approach adopted by mining companies whereby one or two employees are appointed as the sole points of contact for the community. Given the finding that communities have much power in relation to mining companies, if they clearly demanded that they wanted mining organisations to act sustainably (i.e. become sustaining organisations with all of the attributes listed in the Dunphy et al. (2003) sustainability Phase Model), they could make it happen. They are the biggest driving force for environmental management in the industry. All they need to do is set the target and communicate it.

The findings raise the question of whether it would be better for mining companies to be governed by the community rather than having to go through the time consuming, inefficient and costly process of communities getting their requests legislated. The issue would be of course that then there would be no mediating force that could make judgements about what was a fair request of the companies and
what was not. Communities could not have all the power, just as companies could not. There has to be a middle ground in which both parties could benefit (Benn & Dunphy 2007).

Many authors have acknowledged the need for a new form of governance in order for organisations to be sustainable (Bendell et al. 2011; Benn & Dunphy 2005; Benn 2007; Benn et al. 2009; Klettner et al. 2013). They claim that the traditional closed form of management in corporations cannot continue as their ignorance of stakeholder needs and wants will no longer be accepted and they will eventually lose their social licence to operate. The only way for organisations to survive is to allow their stakeholders to have some say in their organisational decision-making processes (Benn et al. 2009). Benn et al. (2009) suggests that an effective model of environmental governance would address the following five factors: identifying the sub-political arena (determining the relevant stakeholders for the particular risk), identifying key interests of the stakeholders involved, creating the community of interest and dispute (where concerns and interests can be discussed), negotiating the deliberative strategies to be used and finally, implementing the decisions.

Perhaps mining companies do not currently see the value in including communities more in their businesses. If so, the value of doing so would need to be clearly explained to them prior to any actions being taken to more directly involve communities in their organisations. Garriga (2014), suggests organisations need to look further than the traditional stakeholder utility function and start identifying the ways in which stakeholders can create value for their businesses. As already identified in this study, one way in which mining companies could gain value from involving communities more in their operations would be to more clearly identify what is required for their social licence to operate. This could significantly reduce the time and resources required to deal with regulators because companies would be dealing face-to-face with the primary change driver, rather than the secondary one.

Noticeably absent as a strong internal driver was leadership. As discussed previously, lack of leadership acts as a restraining force in organisations and it is a common issue for environmental management (Papagiannakis & Lioukas 2012). Environmental professionals themselves were a stronger driver than management, indicating that the leadership for environmental management comes more from the bottom up than the top down. Leadership also comes in the form of setting a clear vision and seeing that it is achieved (Kotter 1996).

Coal mining companies seem to have a vision in regards to environmental management on their websites but there is not enough leadership internally to drive these visions through the organisations. At the corporate level, where leadership was the strongest internal driver, company performance was also mentioned as a driving force. This may be an indication that at the corporate level, there is more
concern for the public image of the company than in the other institutional orders and that may be the reason behind the stronger environmental leadership at this level.

The fact that environmental professionals are seen as the strongest drivers in a couple of the institutional orders does indicate that they hold some power within organisations. If they did not, they would not have been recognised as having the ability to drive change. However, their power does not appear to be strong enough to influence leadership within the organisations (or else management would list as a stronger driver). Therefore, it could be said that the amount of power environmental professionals hold in organisations is not great enough to cause transformational change. If they were more powerful, they could perhaps have the ability to inspire everyone else in their organisations to improve environmental management and then everyone would be seen as drivers (i.e. the environmental professionals would not be singled out).

The individual level was also the only one to have a theme centring on concern for the environment. This suggests that as individuals become parts of teams or groups, some of that concern is lost in the group dynamics. As individuals become members of groups, their focus may be more on the common goals rather than their individual interests as stated by (Rowley & Moldoveanu 2003).

5.2.5 Research Question 5: What are the restraining forces (internal and external) impacting environmental sustainability goal attainment in the industry?

Compliance was found to be the strongest restraining force for the group questioned. This suggests that achieving compliance is the greatest hurdle to overcome before companies can reduce their environmental impact and become more sustainable. Given that compliance, as would be expected, is a strong driving force for environmental management in the industry, the fact that it was also found to be the strongest restraining force may be surprising to some. Regulation is known to have a major influence over the way the environment is managed in industry (Doppelt 2010). It is perhaps no surprise then that if it is an industry is poorly regulated, the environment may not be managed well. Sindhi and Kumah (2012) explicitly state that regulation as a common restraining force for environmental management.

Environmental regulation in any context is no simple matter, and consideration should be given to the complexities of developing effective regulation (Bérubé & Cusson 2002). Firstly, scientific uncertainty can make policy makers hesitant to act. Secondly, the subjective nature of environmental problems means that solutions can never be right, but merely more or less acceptable to certain groups. Thirdly, many environmental problems transcend geographical and political borders, which means that they
need inter-regional, inter-state and international cooperation. Finally, environmental issues tend to have complex causes that spill across many different areas of human activity, making it hard to coordinate action (Evans 2012).

External forces were found to be the greatest type of restraining force for achieving the overarching environmental target in this study. In particular, regulation itself was perceived as a dominant restraining force. Much of the existing literature on factors restraining improvement in organisational environmental performance is related to internal issues such as cultural resistance to change, leadership and lack of resources (Kemp et al. 2010; Lozano 2012). This could indicate the need for organisations to look outside of their own walls for things that may be preventing them from improving their environmental performance. If external factors are indeed impeding their ability to improve, those factors need to be addressed if improvement is to be achieved.

The restraining forces for achieving environmental sustainability goals highlight the relevance of environmental management contingency models such as Hart and Milstein’s (2003). These models take into consideration the complexities of such things as external pressures when an organisation is strategising for environmental improvement. Such models essentially bring to light factors which must be managed if change initiatives are going to be effective.

In force field analysis, the way to move the status quo towards the intended target (unfreezing) is to reduce the restraining forces, rather than increase the driving forces (Lewin 1951). Therefore, in order for companies to progress along the sustainability scale, changes ought to be made to all the things that make it difficult for organisations to achieve compliance. For example, a reduction could be made in the amount of change in policy and legislation if companies are having difficulties with excessively detailed regulations, or changes could be made to anything else stated as an issue surrounding compliance.

The results indicated that companies are already achieving their overarching aim of performing just above compliance. This may suggest that there may be a lack of desire to further improve environmental performance. As a result, there may be no willingness to target the inefficiencies and problems of compliance. Nevertheless, if organisations do wish to attain the sustainability goals stated on their company websites, or wish to simply reduce the frustrations of their everyday work and of dealing with the government, targeting the problems with compliance would be the place to start.

At an internal level, the strongest restraining forces were related to lack of resources and lack of support from workers. These issues could be addressed by human resource programs designed to engage, educate and integrate environmental management in the workplace (Benn et al. 2006; Doppelt
Such efforts would likely improve environmental performance at particular mining operations.

As coercive institutional forces were the strongest type of restraining forces, it may be easier to change them than if they were normative or mimetic forces. They are clearer and more easily defined than normative and mimetic forces which are more subtle, complicated and unspoken (Scott 2005). Coercive forces can be changed with a simple change in regulation, policy or clearly stated demand, meaning that changes can be made quickly and these changes can result in fast, large-scale change in organisations. In terms of sustainability, changes in coercive forces could see mining organisations operating sustainably relatively quickly.

One might see the industry as being less progressive in terms of environmental management because it appears to respond to coercive forces more than anything else. However, this may not be such a bad thing if the true objective of mining organisations and their stakeholders is for them to operate sustainably. If this is their true desire, it should not matter what enables them to get there, only that the final outcome is that they are sustainable.

The literature generally fails to address institutional forces in the context of restraining forces for environmental management and much is documented on institutional forces as driving forces. As demonstrated in this study, coercive forces can have a severe negative impact on organisational sustainability and therefore may need to be taken into consideration when assessing the factors affecting companies. Knowing the types of forces that prevent organisations from improving their environmental performance allows them to know the best way of addressing them (Schwering 2003).

5.2.6 Research Question 6: What is the institutional logic for environmental management in the industry?

The study found that the dominant institutional logic behind environmental management was to maintain a licence to operate. If this is the subconscious thought process behind how and why all employees function in mining organisations, it is a very big hurdle to overcome to improve environmental performance past the compliance level. This institutional logic is essentially an inbuilt program telling workers that all they need to do is ensure that their sites can operate, and everything else is superfluous. Such a finding has major implications for environmental management across all industries as it could be an impediment to environmental improvement efforts in all organisations.

In the context of business, the dominant logic tends to be called the market logic and it focuses on maximising financial gains and improving the viability of the business, so this finding is not unexpected (Bondy et al. 2012). However, this means that the dominant logic is not necessarily aligned with
improving environmental management. It could even be said that it is a logic which is competing with the logic of wishing to be more sustainable.

If the dominant logic of organisations in the industry was not to keep operating, many people (including the participants from the survey) would likely be unemployed. Jobs enable people to support their families and live the lives they want to. Jobs provide security and put food on the table. These are the basic needs of all human beings (Simons et al. 1987). Primal logic and the subsequent motivations of employees are based on these needs and it is therefore understandable that the dominant logic pertains to essentially staying employed (Huitt 2007).

It is difficult for anything else, including environmental management, to compete with this logic. Perhaps the best way to approach this problem would be to talk in terms of operations not being able to operate in the future if the environment was too degraded to support life, resource extraction or rehabilitation. However, given the distant and uncertain consequences of environmental destruction, this type of reasoning (known as ‘the consideration of future consequences’ argument), may not be effective. There is unlikely to be action unless a consequence is immediate and certain (Strathman et al. 1994).

The logic of simply maintaining a licence to operate when it comes to environmental management is in itself a major restraining force for improving environmental performance and becoming sustainable organisations. It essentially suggests that at the subconscious level, people within mining organisations are only really looking to ensure that their operations remain open – they are not looking for their organisations to be sustainable. This thought process is extremely limiting and would no doubt be very difficult to overcome.

5.2.7 Research Question 7: What would need to happen in the industry for it to reach the overarching environmental sustainability goal?

The results of the questionnaire component of the research indicated that the industry is already achieving its ‘on the ground’ target of operating slightly beyond compliance. However, as previously discussed, this goal is not in line with the overarching target on coal mining company websites of becoming sustainable organisations. Therefore, the set of actions generated from the interviews pertain to steps that could be taken if companies were wishing to achieve the goals stated on their websites, or to simply become more sustainable than they currently are.

There is existing literature on how organisations can become more sustainable if they so choose. However, as with any force field analysis, the way forward is always determined by the group participating in the analysis, not the literature. This is because the participants are the ones who
understand the situation best and are likely to know what actions would be effective and what would not suit their specific circumstances. As a result, in this study employees in the mining industry were regarded as the experts for developing an action plan for moving forward and becoming more sustainable.

The following set of recommended actions was generated from the findings from the interviews. They are recommended actions for the industry to take to improve its environmental management and become more sustainable. It should be noted that most of these recommendations are aimed at improving regulation and compliance as this was found to be the strongest restraining force for improving environmental management. According to Lewin (1951), to achieve a planned change, the restraining forces should be reduced rather than the driving forces increased. The set of actions are in no particular order or priority.

1. Take steps to make environmental regulations easier to understand so that mining operations can easily identify exactly what is required of them.
2. Make regulations more scientifically and less politically based (i.e. based on what actually causes environmental harm rather than any political agenda).
3. Develop regulations that provide financial incentives for mining companies to become more sustainable (thus enabling companies to maintain or even increase their profit margins whilst reducing their environmental footprint).
4. Develop regulations that require mining operations to demonstrate continual improvements in regards to reducing their environmental harm.
5. Streamline the approvals process by giving mining companies likely licence conditions at the beginning of the project approvals stage and asking them to demonstrate how they will comply with them in order to gain approval.
6. Improve regulators’ knowledge of mining operations and their environmental impacts by enabling them to spend more time on mine sites and by increasing the amount of direct communication and collaboration between mining companies and regulators.
7. Utilise industry bodies such as the Minerals Council of Australia or state resource councils to drive any desired change in regulations.
8. Improve awareness across the industry of operational environmental impacts to increase the desire to protect the environment.
9. Increase the level of senior management leadership within mining organisations in regards to improving environmental management standards.
5.2.8 Further information on the suggested actions for becoming more environmentally sustainable

**Suggested Action 1:** 1. Take steps to make environmental regulations easier to understand so that mining operations can easily identify exactly what is required of them.

It is well documented in the literature that, if organisations are to act in a certain manner, they need what is expected of them to be clearly communicated (Allen et al. 2007; Barrett 2002; Kotter 1996). Regardless of whether the need for companies to behave in a particular way comes from internal organisational actors such as managers, or from external sources such as regulators, the principle is the same. Targets need be made clear if action is to be taken by people in the organisations (Katzenbach 1993).

Uncertainty about what is expected of people creates resistance to change (Elving 2005). Therefore, in order for organisations to be able to comply with regulations, the regulations need to be clear enough to eliminate any uncertainty. According to Barrett (2002), the more direct, clear and concise the communication is, the more effective it is and the less chance there is of misinterpretation or uncertainty about what it is trying to say. Thus, in the context of environmental regulation, it would be easier to for mining companies to understand regulations if they were more concise and to the point. This would require less volume of regulation and more concise language used in the legislation itself.

The company investigated as part of the pilot study in this project was subject to 28 different pieces of environmental regulation including acts, policies and regulations. This was in addition to its environmental licence. In addition, it had to comply with the environmental requirements of three different government levels – local, state and federal. With figures like these, it is easy to comprehend why there may be some confusion among mining companies about what is required of them.

The volume of regulation could be reduced in a number of ways. For example, federal and state project approvals could be streamlined to institute strategic land-use assessment and planning (Minerals Council of Australia 2014). Overlapping state legislation could be either combined in new, all-encompassing legislation or exemptions could be made so that organisations are only liable under one piece of legislation where there is an overlap in regulations (APPEA 2014).

Another possible way to reduce the volume of environmental regulation would be to put the onus on the companies to demonstrate that the risk they pose to the environment in which they work is at an acceptable level. This has already been successfully achieved in the Australian coal mining industry in the area of safety. Each state with coal mining operations has a single safety act (and subsequent regulations) that mining companies need to comply with. In Queensland, it is the Coal Mining Safety...
and Health Act (1999) and, in New South Wales, it is the New South Wales Coal Mining and Safety Act (2002).

In the safety regulatory framework, companies are required to develop and manage their own safety and health management systems which are based on reducing the risk of injury to mine personnel as much as possible (Joy & Terrey 2006). The regulations do not stipulate how risk is to be managed or exactly how much injury is permissible on mine sites. However, if there is an incident, mining companies need to be able to demonstrate that they managed the risk to the best degree achievable (Department of Natural Resources and Mines 2013).

This approach requires mining organisations to anticipate safety and health problems as proactively as possible, based on risk, before they arise (Department of Natural Resources and Mines 2013). This type of legislation is less prescriptive and requires mining companies to reduce their risk to people as much as possible rather than being permitted to cause a certain amount of harm (as it is in the environmental regulation in Australia). The coal mine safety framework in Australia is essentially more effective than the environmental regulation in that it is less voluminous, but achieves better outcomes. This is supported by the drastic performance improvement in safety at mine sites since this type of regulatory framework was introduced (Joy & Terrey 2006).

**Suggested Action 2: Make regulations more scientifically and less politically based**

This recommendation essentially suggests that environmental regulations should be based on the actual environmental impacts that mining operations may have rather than on what stakeholders or regulators perceive to cause harm. Politics and ideology routinely trump scientific knowledge in making environmental policy (Ascher et al. 2010). Yet science-based policy is essential for effective environmental regulation (Likens 2010; Perrings et al. 2011).

This study found that regulation may be developed based on the agendas of interested parties rather than on protecting the environment. In other words, the regulation may be designed more to serve people than the environment. For example, the community may become concerned about a particular issue (which may or may not be scientifically based). They then lobby the government to do something about it. In order to remain in power, the government may make promises to the community to regulate the issue that they are interested in. Then the community is satisfied, the government is satisfied, but the environment potentially loses out.

When regulation is developed in this way, some aspects of environmental impact mitigation become over regulated and some are missed altogether (Kinzig et al. 2011). Therefore, in order for the environment to be properly protected, regulation needs to be based on what causes real harm to it.
Risk-based regulation is one approach which would enable such a situation (Hutter 2005). Not only does risk-based regulation take out the political agendas of regulators and their stakeholders, it can also help to deregulate over-regulated sectors and increase the amount of flexibility that organisations have in the way they manage their businesses (Hutter 2005). As this study has highlighted all of these issues as being problems for environmental management in the Australian coal industry, perhaps there would be major benefit in adopting such an approach.

The benefits of employing risk-based regulations for environmental management in the industry have been considered before. Evans et al. (2007) described how implementing a risk assessment methodology for sustainable development would be a much more effective means of managing the environment if it was done correctly. They cautioned that there are potential problems with using traditional risk assessment methodology but also highlighted possible opportunities for organisations if they adopted a variation of the approach.

For risk management to be an effective means of managing the environment in the industry, Evans et al. (2007) discussed the need for it to be tailored to risk of impact on the environment (rather than combined with other aspects such as safety in more generic risk assessment processes) to ensure that it gets adequate attention and is not overshadowed by other aspects of the operation that may be of greater interest to management. The risk assessments also need to focus on potential risk to the environment rather than potential risk to the organisations if the environment is harmed (through loss of reputation or fines for breach of licence) as they commonly are for mining companies. Finally, they should not be focussed solely on mitigation measures. The focus should be on eliminating harm rather than simply trying to reduce it.

Unlike standard risk assessments where only the potential negatives of an organisation’s actions are considered, Evans et al. (2007) pointed out that companies could identify opportunities for themselves as part of the same process. By assessing what impacts the organisation may have on things such as resource efficiency improvements, waste reduction, increases in biodiversity, water quality improvements and benefits to the community when conducting environmental risk assessments, organisations may also be able to identify positive opportunities for the environment.

**Suggested Action 3**: Develop regulations that provide financial incentives for mining companies to become more sustainable

In 1991, Michael Porter stood conventional wisdom about the impact of environmental regulation on business on its head by declaring that well-designed regulation could actually enhance competitiveness (Ambec et al. 2013). In what is known as the Porter Hypothesis, he proposed there could be a win-win
situation, in which environmental regulation could induce innovation by making industry aware and willing to exploit otherwise missed opportunities (Bernauer et al. 2006). Porter and Van der Linde (1995, p.105) stated that pollution is a manifestation of economic waste and involves unnecessary or incomplete utilisation of resources. They said that pollution is often coincident with improving productivity of the processes in which resources are used. Based on this reasoning, they argued that properly designed environmental regulation can trigger innovation that may partially offset, or more than offset, the costs of complying with them. More than 20 years after the Porter Hypothesis was developed, and the jury is still out on its effectiveness. Currently the evidence is on the slightly positive side. The hypothesis has spawned a number of papers, both pro and con, in business and academic journals. Most are anecdotal, some are theoretical and a few are empirical (Porter 2002).

‘Polluter pays’ policies have drawn some criticism in that they do not necessarily stop pollution and therefore protect the environment. They may encourage less pollution but they do not prevent it. In some cases, the obligation to reduce pollution is passed onto a third party, enabling the original polluter to continue polluting at their original rate (Kettlewell 1992). The literature highlights two main ways in which innovation can be stimulated by policy – through regulation or through market-based instruments such as pollution taxes and emission trading schemes. Of these, market-based instruments are commonly considered superior in soliciting innovative responses (Kemp & Pontoglio 2011).

**Suggested Action 4: Develop regulations that require mining operations to demonstrate continual improvement in regards to reducing their environmental harm.**

This suggested action is another reason for environmental regulation to follow in the footsteps of risk-based safety regulations. With regard to safety, mining companies ensure that less harm is done to their personnel because they are not prescribed a level of harm that is permissible. In the area of environmental regulation, mining companies are given licence conditions which allow them to cause a certain amount of harm. This type of regulation provides little incentive to cause less harm than is allowed (Doppelt 2010). It acts more like a glass ceiling for performance improvement.

In comparison to safety management in the industry, environmental management is at a much less mature stage (Moran & Evans 2009). Many aspects of environmental management are still reactive while health and safety management is proactive (Moran & Evans 2009). This gap could remain unless improvements are made to environmental regulations. Since the introduction of risk-based regulations for safety in the 1990s, safety performances at operations have improved significantly (Joy & Terrey 2006). The onus is on mining organisations to continually improve their performance and constantly review their processes to ensure they are adopting the safest practices. In addition, workforces are
forever on the lookout for safety hazards, which, if identified, are reported and managed (Department of Natural Resources and Mines 2013).

The same approach could easily be applied for environmental management. Risk to the environment caused by operations is as ever-present as risk to employees and contractors. The risk simply needs to be identified and managed, as it is for worker safety, to reduce actual and potential harm to the environment. By mandating a risk management approach to environmental management, harm to the environment could be greatly reduced and environmental performance improved (Evans et al. 2007).

Dunphy et al. (2007) also acknowledge the benefits of a risk-based approach to environmental management in terms of driving companies past the compliance stage of environmental performance. They see risk management as a way for companies to act proactively rather than reactively and adopt ‘voluntary’ environmental improvement measures. They also state that managing the environment with a risk minimisation approach allows organisations to be more adaptive and amenable to new environmental requests by their stakeholders.

**Suggested Action 5:** Streamline the approvals process by giving mining companies likely licence conditions at the beginning of the project approvals stage and asking them to demonstrate how they will comply with them in order to gain approval.

The inefficiencies of the environmental approvals processes in Australia are well known. Complaints have centred around the onerous requirements of negotiating the seemingly ever-increasing and enigmatic ‘green tape’ government agencies now require companies to complete before they can approve licences (Doig 2012). In fact, environmental approvals worldwide are considered excessively rigid and cumbersome and it is suggested that many governments need to rethink the approvals process and reform the relevant legal and regulatory frameworks (Bérubé & Cusson 2002). There is no argument over whether environmental approvals are required. Australian mining companies in particular see them as important and necessary (Annandale & Taplin 2003). It is the requirements and government processes which have companies up in arms (Doig 2012).

The need for reform has been acknowledged by state and federal governments in Australia. In 2013, the Queensland Government introduced the ‘Greentape Reduction’ program, which aimed to reduce statutory timeframes and simplify application processes. The federal government is currently working with the state governments to create a ‘one-stop shop’ for environmental approvals. The one-stop shop does not replace any state or federal environment laws – it simply streamlines the process, ensuring that just one application, instead of two, needs to be made (Abbott 2013).
These initiatives show that the governments are committed to improving the approvals process. However, the effectiveness of their improvement schemes are yet to be seen. The initiatives they have developed are focussed on government processes rather than the types of outcomes the approvals provide. As the participants in this study suggested, perhaps governments should be focussing more on the licence conditions they hand out.

**Suggested Action 6:** *Improve regulators’ knowledge of mining operations and their environmental impacts by enabling them to spend more time on mine sites and by increasing the amount of direct communication and collaboration between mining companies and regulators.*

Ensuring the presence of regulators on mine sites and increasing the level of collaboration between mining companies and government could be achieved in two different ways. It could be integrated into an agreement between industry and government (for example, through industry bodies) or between individual companies and their regional regulators. Another way would be to legislate compulsory visits by regulators, or requirements for mining operations to report on day-to-day issues.

Having knowledgeable regulators and good communication between mining companies and government is standard for health and safety in the industry (Joy & Terrey 2006). Inspectors who are required to have wealth of mining experience regularly inspect mine sites and investigate incidents. Regular communication is established through mine sites having to notify the regulator about a myriad of issues (including serious hazards). They are also required to submit safety reports and briefs on a regular basis (Department of Natural Resources and Mines 2013). Such requirements are lacking with regard to environmental matters. Mining companies are only required to report major incidents (not hazards or minor incidents which if monitored, could prevent future serious environmental harm) and deliver yearly plans on how the operations are most likely to be managed in the following year. As confirmed by this study, the presence of environmental regulators onsite is also minimal.

If being able to get regulators to visit sites more regularly is not possible, another option would be for regulators to do scenario-based training and planning to improve their knowledge of environmental issues. This type of program is proving successful in the United Kingdom where the Department of Energy and Climate Change is utilising scenario planning to develop effective carbon capture and storage regulation (Vannan & Gemmell 2012). Given the apparent lack of experienced environmental regulators in the Australian coal industry, any training on environmental management in mining would no doubt prove beneficial, whether it were scenario-based or not.

**Suggested Action 7:** *Utilise industry bodies such as the Minerals Council of Australia or state resource councils to drive desired changes to regulations.*
The major industry bodies representing the Australian coal mining industry are the Minerals Council of Australia (which as of August 2013, now encompasses the Australian Coal Association), the Queensland Resources Council and the New South Wales Minerals Council. Each of these associations represents its member companies, thereby providing them with a united voice. They act in the best interests of the organisations that they represent (Australian Coal Association 2013a).

The Minerals Council of Australia is the peak industry body of Australia’s exploration, mining and minerals processing industry. According to the organisation’s website, it represents the minerals industry both nationally and internationally in advancing its member companies’ contributions to sustainable development and to society. It advocates public policy and operational practice for a globally competitive minerals industry that is safe, profitable, innovative and environmentally and socially responsible (Minerals Council of Australia 2014). In terms of driving regulatory change, the Council lists regulatory reform as one of its major priorities. It states that ‘regulatory reform is urgently needed to poorly developed and administered regulation at all levels of government. Inefficient and overlapping regulation is creating higher costs and uncertainty for the minerals industry’. It then highlights the need for reform in the area of project approvals (Minerals Council of Australia 2014).

The Minerals Council of New South Wales supports the development of an effective regulatory framework in which the industry can operate profitably and make a meaningful contribution to the state and the people of New South Wales. It works closely with government, industry groups, communities and business leaders to foster a sustainable mining industry in the state (NSW Minerals Council 2014). The Queensland Resources Council also works collaboratively with organisations and stakeholders to achieve positive outcomes for its members. It works to secure an environment conducive to the long-term sustainability of the minerals and energy sector in Queensland and aims to be influential with governments, the community and the media. The council sees its role as building strong community and stakeholder support for the industries’ social licence to operate and to promote a world-class regulatory environment (Queensland Resources Council 2014).

**Suggested Action 8:** Improve awareness across the industry of operational environmental impacts to increase the desire to protect the environment.

As stated previously, uncertainty leads to resistance to taking action (Elving 2005). In regards to environmental management, this means that if employees at mine sites are uncertain about how to protect the environment, they will be unlikely to do it. In addition, if there is limited awareness about what impacts their actions are having on the environment, they could be causing a great deal of harm without even knowing it.
Environmental awareness could be improved in the industry in a number of different ways. Individual companies could increase the amount of environmental training courses that they run in-house. Seminars could be run which present the latest scientific findings in environmental management. Communication campaigns which utilise such things as social media, television, pamphlets and other forms of communication could be run in communities in which mines are located to educate people about their impacts. All of these suggestions would no doubt improve environmental awareness to some extent. However, they are likely not sustainable or as effective as other forms of communication. Then there is the issue of cost – who would pay for these initiatives if they were not compulsory?

This study found that coal mining organisations are most responsive to coercive forces when it comes to environmental management. In other words, they would be unlikely to act unless they had to. Therefore, initiatives to improve environmental awareness would most likely need to be regulated if they were to be adopted by mining companies. This is another area where safety and health efforts have excelled in the industry. Due to the regulatory requirements for all mine site personnel to undergo compulsory safety induction training before commencing work onsite, in addition to being competent in any relevant Australian registered coal mining safety courses, mine site employees and contractors are aware of safety risks and obligations while onsite (Department of Natural Resources and Mines 2013).

The coal mine safety training includes hundreds of nationally accredited coal mining competencies. To date, there have been no equivalent environmental courses developed. Nor is there any legal requirement for mine site employees to be signed off as competent in any area of environmental management. Given this difference in the training available and the differences in legal requirements, it is easy to see why safety and health efforts are much more mature than efforts to protect the environment (Moran & Evans 2009).

**Suggested Action 9:** Increase the level of senior management leadership within mining organisations in regards to improving environmental management standards.

As discussed in Chapter Two, leadership is an essential ingredient in an organisation’s ability to become more sustainable (Doppelt 2010; Gill 2002; Klettner et al. 2013; Pearce & Sims 2002; Stoughton & Ludema 2012). The leadership team needs to be committed, have a clear vision of what it is trying to achieve. It needs to have clear performance goals and be able to communicate all of this to the workforce (Katzenbach 1993).

With regard to improving leadership for environmental management in the industry, mining leaders may need to develop a vision of how they would like their organisations to manage the environment
and be committed to achieving the vision. They may also need to develop clear environmental management improvement targets and effectively communicate these to employees in all levels of the organisation. Of course, the leadership team needs to be knowledgeable on environmental matters to be able to do this. If leaders are not aware of environmental issues, their understanding could be improved by the suggestions in Suggested Action 8.

5.3 Conclusions regarding research aim

Environmental sustainability policy and practice do not align in the Australian coal mining industry. In fact, they do not align in two ways – the level that they are currently performing at and the level they are actually aiming for in practice. The environmental sustainability performance level the industry claims to aspire to is to have sustainable organisations (which is the highest out of the six different performance levels in the Dunphy et al. (2003) sustainability Phase Model). In practice, mining organisations aim for, and perform at the compliance level (which is half-way along the sustainability scale and three levels lower than what is espoused). This is quite a large difference between policy and practice.

Although there were found to be many factors contributing to how well aligned environmental sustainability policy and practice are (as discussed in previous chapters), the major findings are that community is the strongest driver and poor regulation is the strongest restraining force. In addition, maintaining a licence to operate was found to be the institutional logic for why the environment is managed the way it is in the industry. Recommendations for how policy and practice could align mainly centred on making improvements to regulations.

The findings make a contribution to knowledge on the industry in that they provide the information required for the industry to be able to achieve its environmental sustainability goals. They reveal how the industry is currently performing against its targets, and they highlight what is helping and is hindering efforts to achieve these goals. Furthermore, the study delivers nine key, practical actions that the industry could to achieve environmental sustainability.

5.4 Implications for practice

5.4.1 Practical implications for any organisation

The approach used in this study could be applied to any organisation to enable it to become more environmentally sustainable. This study provides the means for organisations from any industry to select which environmental sustainability performance level they would like to achieve out of the six
clearly explained categories (i.e. clear sustainability targets), and assess their current performance level against that aim. It then determines what needs to be done to achieve the target and how to develop a company-specific action plan. The method developed in this study is essentially an all-in-one organisational environmental sustainability assessment and improvement tool.

This study provides a methodological framework for any industry or organisation wishing to improve in a particular area of business. For example, if an industry had a poor safety record, they could conduct a large-scale force field analysis, like the one in this study, to understand how they are currently performing as opposed to where they want to be, what is likely to help them achieve their goals and what is likely to hinder them, as well as what steps they needed to take to reach their target. Although force field analysis was not developed by this study, its application to an entire industry and discipline is unique. It can therefore be used as a model for other industries, regions or disciplines.

The research identified the need for companies to be clear about what it is they are aiming for in regards to their environmental sustainability performance level before any improvement efforts are made. If the target is not clear, there will be a lack of direction and any momentum gathered for the change process will dissipate before success can be achieved (Beaver 2000). This means that organisations across any industry will need to understand what environmental sustainability is so that they can have something clear to aim for. Organisations are commonly confused about what sustainability is, which makes it very difficult to know what they are aiming for or how they are performing (Bell & Morse 2008; Dyllick & Hockerts 2002). This study addressed this issue by demonstrating the use of a pre-determined organisational sustainability scale to measure performance and target levels.

Although not developed as part of this study, the use of the six-level sustainability scale (developed by Dunphy et al. (2003) and known as the sustainability Phase Model), in the real life context of the Australian coal mining industry demonstrated how confusion around environmental sustainability can be reduced, so that organisations can have clear direction about how to measure and improve their performance. By utilising the scale as a means of assessing the extent of the gulf between policy and practice, organisations can gain an understanding of how far away they are from their goals, and therefore how much effort needs to go into improving their performance. The scale can be applied to any organisation.

The study found that there may be misalignment not only between environmental policy and performance in organisations, but also between espoused targets and what is being aimed for in practice. The issue is that if a firm’s espoused and actual targets do not align, and the actual targets are
much lower than the espoused ones, the espoused goals will not be achievable. Therefore, before organisations can realise their espoused environmental sustainability targets, they may need to establish whether they are aiming for the same thing in practice.

This research also discovered the benefits of listening to communities directly in industries that have the potential to greatly impact their neighbours. If there is no direct means of communication, or if communities have no say in the way operations are run, they will demand action through the regulators as a means of addressing their concerns. This increases the amount of regulation for organisations and leaves them open to ineffective, costly and time consuming regulation which in turn makes their businesses suffer.

Key issues in regulation that have the potential to restrict companies in any industry from being more sustainable were also identified in this study. They include environmental regulations which are unclear, which are politically based rather than scientifically based, that provide no financial incentives for companies to become more sustainable, and that do not require continual improvement. Poorly qualified, inexperienced regulators can also hamper progress towards sustainability. As a means of addressing these issues, this study suggests the use of industry bodies to liaise with the regulators. This is an approach which is likely to be applicable across all industries.

This raises the issue of looking outside of organisations for potential restraining forces which may be hindering environmental sustainability, as demonstrated in this study. As mentioned above, poor regulation can have a major impact on companies and can prevent them from becoming sustainable, as is the case in the coal mining industry. Often the change management literature will direct organisations to look at what is restraining them internally from achieving their goals. This study shows that businesses may be greatly affected by external forces too. If not addressed, they have the potential to prevent organisations from becoming sustainable.

Another potentially major influence on how environmental sustainability is managed in organisations is the organisation’s institutional logic. As found in this study, institutional logic can be a major inhibitor of improvement if it conflicts with the espoused aims of the organisation. For example, if the logic deems that the environment is not important, or that other aspects of the business take priority, it will be difficult for organisations to ever become sustainable. Institutional logic surrounding environmental management is relevant for all organisations, and if not managed, can severely impede on a company’s ability to improve.
5.4.2 Practical implications for the coal industry

The industry as a whole may want to consider whether in practice, it really wants to improve its environmental management standards and become environmentally sustainable. Company policies and websites indicate that they do but in practice, the findings suggest that they are only really aiming to achieve a level slightly better than compliance. Furthermore, they are already achieving this target which means that there may in fact be no real aspiration to do any better.

If there is a true desire to achieve sustainability, this study has provided an action plan which can enable companies to do so. The action plan focuses on targeting the issues surrounding regulation (the strongest restraining force for improving environmental management in the industry). As suggested by the participants, the way in which the industry should go about making those changes in regulations is to make use of the industry bodies such as the Minerals Council of Australia or state resource councils.

**Practical implications for mining companies in the industry**

If mining companies wish to align their environmental sustainability policy with practice, they first need to make the in-practice target the same as their policy targets (i.e. to be sustainable organisations). Setting the internal organisational aim is the first step to achieving a desired change (Appelbaum et al. 2012; Palmer et al. 2006; Wood et al. 2006). From there, a company’s planned change management programs could be developed which outline the actions need to be taken to achieve the goal (Burnes 2004a; Kotter 1996; Schwering 2003). As discussed previously, it is possible that mining organisations do not know what sustainable organisations are, and this would need to be clarified prior to their asserting that that is what they are trying to achieve.

Another key aspect of enabling such a change is leadership (Gill 2002). Once the internal vision is developed, companies would need to ensure that they had effective leadership to execute the desired change. The results of this study indicate that leadership is lacking for environmental management. In fact, this study found that environmental sustainability leadership was only really present at the corporate level. Therefore, action would need to be taken to ensure that leadership carried down through all of the institutional orders to facilitate change at the operational level where environmental harm occurs.

As communities were found to be the strongest driving force for environmental management, companies could benefit from providing a platform for communities to directly voice their concerns and demands rather than having to go through the regulators. This, in turn, would reduce the number of regulations companies need to comply with and this could free up resources which could then be used
to improve environmental management. Acknowledging the role that communities play in operations, and directly engaging with them to understand exactly what they want, is one way to improve the sustainability of operations (Benn & Dunphy 2004).

To facilitate a change in the institutional logic so as to increase the priority given to environmental management in mining workforces, companies may wish to consider how to improve employee consideration of future consequences. By making the consequences of not reducing operations’ environmental footprint immediate and definite (for example, by imposing penalties for not acting correctly), the logic of the workforces may change (Strathman et al. 1994).

The results of the interviews indicate that, if mining companies wish to have more practical environmental regulation and be governed by more experienced regulators, they may need to be willing to work more closely with the government. More specifically, they may need to be willing to allow regulators to spend more time at their operations in a bid to improve their understanding of how mines operate and how they impact the environment. They may also need to be open to working collaboratively with the regulators on addressing site-specific regulatory issues and developing solutions to problems when the two parties do not agree.

In order to obtain more internal support in organisations for environmental management, businesses could consider adopting human resource strategies such as environmental learning and development programs, cultural improvement programs or changes to position descriptions to ensure environmental accountability for all employees. By including environmental management in company human resource systems, organisations can ensure there will be much more buy-in from workers (Doppelt 2010; Klettner et al. 2013). In addition, companies may wish to consider a performance appraisal system to monitor the commitment of employees to environmental initiatives (Benn et al. 2012). Performance appraisal systems reinforce an organisation’s focus on environmental management and demonstrate to the workforce that performing well in environmental management is something that management sees as important. Such systems also enable management to measure the effectiveness of programs they have implemented (Kuvaas 2011).

**Practical implications for industry communities**

The findings of the study show how much power communities actually have in driving environmental management standards. If communities understood this, they could achieve more of what they wanted from the mining companies. Perhaps this knowledge will provide the comfort communities need to be able to voice their concerns directly with the organisations operating in close proximity.
Communities could demand that mining organisations perform as sustaining organisations as defined by Dunphy et al. (2003). Given the way in which things currently work in the industry, this demand could eventually turn into regulation and this, in turn, would make the mining organisations adopt sustainability as their overarching environmental goal. If mining organisations target compliance as their environmental performance goal, then compliance requirements should be for companies to be sustaining organisations in order for them to be sustainable.

Communities could also improve organisational sustainability if they focussed their attention on improving regulations. By demanding that regulations be amended to require companies to demonstrate continual improvement in environmental management, rather than simply requiring them to meet their static licence conditions, the community could be assured that there will be an ongoing commitment from companies to continually reduce their environmental impact (Doppelt 2010).

In addition, communities could help to improve environmental regulation (and thereby enable companies to be more sustainable) if they were to put pressure on the government to make regulations clearer and more scientifically/evidence based. They could pressure governments to change regulations so that they included schemes with financial incentives and make them more practical (as found in this study). Of course, having the community lobby for these types of changes may seem counter intuitive as the direct benefits of having better regulations initially go to the mining companies. The communities may feel as if it is their not their job to lobby on behalf of mining companies. However, what the communities need to understand is that by making these changes to regulations, companies can become more sustainable and that, in turn, benefits to the communities and the environments surrounding mining operations.

Communities must understand that their requests need to be clear, measurable and reasonable for companies to be able to act. As stated earlier, targets need to be clear if they are to be achieved (Gill 2002). Requests need to be in a language that companies can understand and respond to without confusion. If communities are not clear about what they ask for, companies may not know how to go about satisfying them. If requests are unreasonable or put the viability of operations in jeopardy, they will most likely be ignored by the operations as their dominant logic is to keep the mines operating (Benn & Dunphy 2007).

**Practical implications for industry regulators**

Governing bodies may need to recognise how difficult it currently is for coal mining companies in Australia to achieve compliance. They may also need to understand that the regulations and governments themselves are standing in the way of organisations reducing their environmental harm to
some extent. Once these issues are acknowledged, companies may be in a position to want to improve the situation. As part of this, the government may need to review the current environmental regulatory framework and be open to changing areas of it that are not effective. If the government is not willing to try and resolve these issues, it would likely be difficult to see huge improvements in the way the environment is managed in the coal mining industry.

As with mining companies, regulators may also need to be willing to work more closely with operators to improve regulations. The interviews revealed that more collaboration and communication is required to ensure the needs of both regulators and mining organisations are being met and effective regulation is delivered. Furthermore, it was found that regulators need to appreciate that mining companies need to be monitored by experienced personnel who understand how mining operations work and the environmental issues they face.

The findings from the interviews indicate that an effective way to improve regulator knowledge of mining impacts on the environment would be to have the regulators spending more time at mine sites. This was suggested as a means for them to learn, but not as a means to conduct more compliance inspections which would most likely see the mining companies become less willing to open their doors and work collaboratively. In order for regulators to spend more time at sites, the government would likely need to support their staff by offering them the time and resources necessary.

The study also found that another way to improve regulator knowledge of environmental management at mining operations would be to develop a strategy to retain employees with experience. The interviewees offered a couple of suggestions of how this may be done. They stated that the differences in salary between industry and government needs to be addressed somehow, as government employees tend to leave the lower paid public sector to go to the highly paid private sector. Addressing this problem was not presumed an easy task by those interviewed, but nonetheless, they believed that it needed to be addressed to prevent history repeating itself. Another suggestion to retain government employees was to place people on cadetships or internships in which they are contracted to stay working for the government for a certain period of time, whilst receiving all the training they needed to be competent at their jobs.

It is worth noting that having more experienced personnel working for the government would not only benefit the mining companies. Having experienced personnel would mean that effective regulations could be developed the first time around. This would mean less change was required in the future and fewer resources would be wasted in managing poor regulations.
5.5 Implications for theory

5.5.1 Existing theory implications

One of the most significant implications from the findings of this study for organisational planned change management theories, is the need to look outside of the organisation for factors which may inhibit change efforts. Traditional change management programs (such as force field analysis) focus their attention internally to bring about change. This study found that there may be external forces which need to be considered in organisational change programs before the desired change can become a reality. For example, this research found that regulation is a major impeding force for organisations wishing to become sustainable. If this problem is not addressed, it is unlikely that organisations in the industry will be able to become sustaining organisations.

The applicability of institutional logic in the field of organisational environmental management was demonstrated. The findings of the study highlighted the pivotal role logic plays in the environmental standards of practice within organisations. If this issue is not considered in attempts to improve performance, companies may find it very difficult to advance.

Institutional theory was able to be applied to environmental sustainability in this study in terms of what is restraining organisations from improving. Institutional theory has previously been considered with regard to the forces driving improvements in environmental management, but not in regards to forces restraining improvements. As demonstrated in this study, knowing the types of institutional forces that are preventing organisations from becoming more sustainable is important as it can have implications for how they are addressed. For example, this study found that if coercive regulations are found to be a restraining force they could be addressed by changes in policy or regulation. If normative forces were a dominant restraining force, they would need to be addressed with some sort of organisational culture change program (Scott 2008).

Espoused theory was built on in the study by demonstrating that there are different levels of espoused theories and theories-in-use within organisations. It is not as simple as an organisation having one single espoused plan of action and one actual plan. Both espoused and actual plans can differ at any level in the organisation, resulting in undesired outcomes (as demonstrated in this study where only three out of the four institutional orders listed achieving compliance as their main aim in practice. The other institutional order’s priority was to reduce their environmental impact). Therefore, when investigating organisational espoused theories and theories-in-use researchers may need to consider the potentially different views of each organisational level. Espoused plans and actions may not only
differ vertically within organisations as in this study. They could also differ horizontally across different departments and operations within the same corporation.

These differences between levels and groups within the organisation go to show the importance of combining leadership with aligning espoused theories and theories-in-use. If there is no leadership to align the espoused values and plans through organisations, they will most likely remain espoused rather than actual. Leaders need to ensure that everyone throughout their organisation aspires to achieve the same thing if they are to attain their corporate targets. There only needs to be one level/group or individual in the organisation who does share the corporate target for a gap to remain between policy and practice.

The different levels within an organisation are also of importance for field theory, and on a practical level, they are important in any organisational force field analyses conducted. This study demonstrates that there are different forces present at each institutional order and they have an impact on the achievability of organisational objectives. For example, standard practice, compliance, contractors, time and cost were each listed as the strongest internal restraining force for environmental management for one of the institutional levels. If such factors are not taken into consideration when conducting a force field analysis, all of the factors which need to be managed in order for the planned change to take place will not be identified, and this may prevent the attainment of the desired outcome.

5.5.2 Theory methodology

The methodology adopted in this study was unique in a number of ways. Firstly, force field analysis and a pre-determined scale were combined. This combination established an all-in-one organisational environmental sustainability assessment and improvement tool. The tool could be utilised by any organisation wishing to improve its environmental performance.

Force field analysis was applied on a much larger scale than in any previously documented force field analysis. In the past, force field analyses have only been conducted at the operational or organisational scale. In fact, the literature describes force field analysis as ‘widely used by organisation development practitioners to plan and implement organisational changes’ (Thomas 1985, p.54) and a ‘tool long used in planned change and organisational development efforts’(Schwering 2003, p.361). Examples of the types of situations where force field analysis has been used include the introduction of a new type of shift pattern in a day ward in a hospital in the United States (Baulcomb 2003), a trial of a new system of parking at a university (Iowa State University 2014) and the introduction of a new management system for nurses in hospitals (Bozac 2003).
This study analysed an entire industry. The researcher believes this approach was valid given the underlying assumptions in Lewin’s field theory (Lewin 1951), on which the force field analysis tool is based. The theory pertains to individual and group behaviour depending on the situational driving and restraining forces present. Nowhere does the theory explicitly state the size of the groups that the principles are relevant for. It certainly does not stipulate that the theory is only applicable to small groups. Given this understanding, the researcher could not see a reason why the force field analysis tool could not be adopted at the individual, departmental, mine site, corporate or industry level. In fact, she saw the benefits of doing so as it allowed for a more holistic and bigger picture view of what was happening in the industry. She was able to encompass many more factors impacting environmental management than she could have done, had the analysis only been done at the operational level.

A review of the literature also failed to find documented examples in which force field analysis had been used for an entire discipline (such as environmental management). Cases where the tool had been used included much more specific projects, internal to organisations, where a planned change management initiative was required – for example the introduction of a new technology or system into an organisation. By applying force field analysis to scales and situations that have never been analysed before, the research made a contribution to the application of theory.

By analysing the environmental management discipline as a whole, the author was able to encompass all facets of the discipline including staff support, technology, environmental management systems, and other influencing organisations. All of these factors have the potential to affect the ability of organisations in the industry to reduce their environmental impact, and should therefore be considered. Ultimately, it is the environmental management discipline as a whole which has to support becoming sustainable or else it will not be achievable. Without the commitment of the discipline as a whole, there will always be one aspect preventing it from happening.

The application of institutional logic when conducting a force field analysis was another unique application of theory in this research. This use of the concept of institutional logic was deemed to be essential by the author. Force field analysis itself considers which forces are present in a situation that help or hinder a planned change. What it fails to consider is the free will of the actors to choose how they respond to those forces. Although this weakness in the tool was surely never intended by Lewin, given his deep understanding of social situations and human behaviour (Burnes 2004a; Burnes 2004b; Swanson & Creed 2013), the standard force field analysis conducted in organisations today fails to consider such complexities in the social situation (Swanson & Creed 2013). As demonstrated in this study, employee logic surrounding particular issues can act as a major driving or restraining force for a
planned change. Therefore, it is suggested that institutional logic be taken into consideration by researchers undertaking force field analyses in the future.

The literature is laden with commentary on how different organisations measure and report their environmental performance. A key issue with how reporting is currently done is that there is no standard approach, and so organisations cannot be compared (Husser et al. 2012). In addition, the general public often does not understand what each reporting criterion means in the overall scheme of environmental performance (Bendell 2009; Jenkins & Yakovleva 2006). This study provides a method of determining an organisation’s overall environmental performance in a clear and simple manner. Although the Dunphy et al. (2003) sustainability scale (the Phase Model) was not developed as part of this study, the study demonstrated the applicability of the scale in an organisational context. If this method was adopted outside of the industry, stakeholders would be able to immediately establish how their organisation was performing and whether they needed to improve.

5.6 Limitations of the research

One of the limitations found during the course of the study was that not all coal mining companies in Australia have environmental sustainability information available on their websites. This was especially true for private companies who are neither expected, nor required, to have such publicly available information. However, the organisations who did provide this information online and were therefore included in this study, represented 80% of coal mining operations in the country.

The second- and third-strongest institutional forces (out of the three types) were not able to be determined as part of the study. This was not seen to be a major issue, however, as after the pilot study the researcher had broadened the focus of the study to include all forces potentially impacting environmental management, not just institutional forces. Therefore, any information on the second and third types of institutional forces would only ever have been additional information and not essential to the study.

5.7 Further research

The findings of the research raised a number of questions requiring further investigation which were outside the scope of the study. The first of these is whether or not companies understand what environmentally sustainable organisations are. As many (inside and out of the coal industry) are espousing the aim of becoming sustainable organisations, it would be extremely difficult for them to achieve that level if they do not know what it is they are aiming for. Similarly, it would be worthwhile
investigating whether organisations believe that satisfying all of their mandatory environmental requirements (i.e. the compliance level of organisational sustainability) means that they are operating sustainably. If there is a misconception that organisations are operating sustainably by achieving compliance, this places a huge impediment on them ever moving past the compliance level. It would mean that, in reality, organisations are only aiming to achieve compliance, not sustainability, and, as such, they create their own glass ceiling at the compliance level.

As communities were found to be such a strong driver for environmental performance improvement, further research could be conducted to determine whether communities are aware of their power over organisations. By harnessing their power, communities could initiate direct, effective and substantial change in organisations. This in turn, would also help the industry to be more sustainable.

The findings of the study pertaining to the coal mining industry in Australia could be used for comparison studies in other industries or for longitudinal studies in the same industry. For instance, if the construction industry wanted to compare their environmental performance with the environmental performance of the coal mining industry, they could compare it with the findings of this research. Another example would be if another industry wanted to compare what was driving and restraining environmental management in their industry, they could compare theirs with those found in this study. In addition, comparisons could be made between the environmental targets aimed for in the coal industry and those aimed for outside of it.

This research identified a gap between what is publicly stated on websites by organisations as environmental targets and what is actually being targeted. Further investigation could be conducted to determine whether this is a common occurrence in other industries or countries. If it was found that there was a common disconnect between website claims and internal realities, it could perhaps call for more stringent regulation around what companies can publicly state on their websites in terms of environmental management and corporate social responsibility.

Further investigation could be conducted into the role of community as either primary or secondary drivers for environmental management. The role of communities as primary drivers of change for environmental management, and their potential influence on the regulators, puts an interesting spin on the concept of social licence to operate. In cases where organisations are performing at the compliance level, does it mean that they have not had to gain a social licence to operate, or does it mean that they gained their social licence to operate by obtaining their regulatory licence to operate?

With respect to the Australian coal mining industry, the viability of adopting a similar regulatory framework to the industry’s health and safety framework could also be investigated. The framework
appears to suitably address and eliminate many of the issues which arise in environmental regulation. The health and safety framework has proven remarkably successful in improving safety performance in the industry (Department of Natural Resources and Mines 2013; Joy & Terrey 2006) and it is believed it could do the same for environmental performance.

5.8 Study summary

This study investigated whether environmental sustainability policy and practice aligns in the Australian coal mining industry and what could be done to close any gaps between the two. In doing so, it established an action plan to enable the industry to become environmentally sustainable. In addition, it developed an all-in-one environmental sustainability assessment and improvement tool, which could be utilised by any organisation wishing to improve its environmental performance.

The research identified what was helping the industry achieve its goals and what was hindering it from doing so. Methods consisted of a document review, an online qualitative questionnaire and in-depth interviews. Analysis of the data was completed using the qualitative data analysis program Leximancer. The use of Leximancer was found to benefit the study in a number of ways. Firstly, it greatly reduced the amount of time needed to collate, code and analyse the data. Secondly, without the use of the program, the results would not have been presented in such an effective and interpretable format. Concept maps generated by Leximancer present a lot of different information in one single diagram. This allowed for fast and accurate analysis of the results.

The findings suggest that environmental policy and practice do not align in the coal mining industry in Australia. Publicly, organisations are aiming to be sustainable (the highest possible performance level out of six). In practice, organisations are only aiming to perform at the compliance level (which is the third performance level out of the six). It was also found that, on the ground, mining organisations are already achieving their in-practice targets as they are performing at the compliance level.

The strongest driving force overall for achieving their environmental management target (of slightly more than compliance) was found to be community. Community was found to be a more indirect influence and was classed as a primary driving force. It was seen to drive regulation which had a more direct impact on mining companies. Regulation was therefore seen to be a secondary driving force. In other words, community was found to be driving regulation which had a direct influence on mining organisations.

The strongest force restraining organisations in the industry from achieving their overarching environmental target was found to be an external one. It was related to regulation and regulators
themselves. These restraining forces became the focus of what needed to be addressed if organisations wished to fulfil their website aspirations of becoming sustainable organisations. It was noted that as the strongest restraining forces were the coercive types of institutional forces, they could be changed more easily than the other more subtle types of institutional forces.

The study identified nine key actions that the industry could take in order for mining organisations to be able to improve their environmental sustainability. The actions mainly centre on improving regulations, however, there probably needs to be a change in some other factors as well (such as community demands and institutional logic) before organisations can become fully environmentally sustainable. The institutional logic behind why the environment is managed the way it is in organisations was found to be a desire to maintain a licence to operate. This type of logic has massive implications in terms of how much of a restraining force it may be in itself for achieving better environmental performance. Further investigation on this topic was suggested in the study.

In summary, the study took a snapshot of environmental management in the Australian coal mining industry. It found that organisations are not currently performing sustainably environmentally, and nor are they aiming to do so in practice. It identified numerous factors which are preventing the industry from moving forward. These factors need to be addressed in order for organisations to reduce their footprints as much as possible. Finally, it provided practical guidance on actions that need to be taken if the industry does truly wish to become environmentally sustainable.


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Appendices

Appendix 1: Main study project information sheet and consent form

Appendix 2: Pilot study information sheet and consent form

Appendix 3: Focus group force field analysis questionnaire

Appendix 4: Pilot study questionnaire

Appendix 5: Pilot study focus group outline

Appendix 6: Pilot study interview sheet

Appendix 7: Pilot study SWOT template

Appendix 8: Research Phase 1 (website review) Leximancer theme and concept list

Appendix 9: Research Phase 2 (qualitative questionnaire) Leximancer theme and concept lists

Appendix 10: Research Phase 3 (in-depth interviews) Leximancer theme and concept lists