

Social Discourses on Coal Seam Gas: Environmental Justice and the Media in the Hunter Valley, NSW



Left: The Hunter Valley. Photo: Chris Bagia; Right: Coal Seam Gas Protest NSW. Photo: (Green Left Weekly, 2011)

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Declaration

I hereby declare that this thesis has not been previously submitted to any other university or institution for a higher degree. Except where otherwise acknowledged, this thesis is comprised entirely of my work.

A handwritten signature in black ink, appearing to read 'Bagia', with a stylized flourish extending from the end.

Christopher Bagia

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Abstract

Research into Coal Seam Gas (CSG) in Australia has so far focussed on scientific and technical issues associated with its extraction and impacts on the environment. There is a large gap in knowledge about CSG relating to the social issues and impacts that arise from CSG development. This includes how the mining of CSG will affect local communities, and the energy and environmental futures of NSW. This research develops a case study of social perspectives on CSG in the Hunter Valley. The Hunter Valley has a history of contested land uses. It is considered to be the NSW wine and agricultural food bowl and has a history of coal mining, and it is now a proposed extraction site for CSG mining. Given the contested nature of the CSG industry in this region and its dependence on water, any impacts to ground water resources could severely affect the livelihoods upon which the local communities depend. CSG frames environmental justice concerns in the Hunter Valley – how environmental decision making and land uses differentially impact on local communities, and their capacities to sustain economically and environmentally healthy places. The case study utilises discourse analysis to explore social perspectives on CSG from a variety of sources, including CSG policy and print media. The goal is to understand how discourses on CSG shape public perceptions of its impacts, and how different framings of CSG are utilised by different actors in the region. This also informs how social perspectives on CSG are empowered and disempowered in policy and planning frameworks, and how communities themselves act on CSG development.

1. Introduction

In the last few decades the natural gas industry has developed rapidly and has presented itself as a viable alternative to finite resources of coal and oil (Bennett et al., 2013). At present the natural gas industry in Australia is centred on and driven by the extraction of Coal Seam Gas (CSG) (O'Sullivan and Paltsev, 2012). CSG has been promoted as the transition from noxious fossil fuels like oil and coal to a greener and cleaner burning energy source (Bennett et al., 2013). The push for further exploration, extraction and use of CSG has led to the former premier of Queensland Anna Bligh to state that this is fast becoming the new "gas age." Furthermore, Bligh believes that it will offer not only Queensland, but Australia, more opportunities for employment. It will also usher in a new age of prosperity for the Australian economy and the public (Bligh, 2011). However, the natural gas industry has come under public scrutiny with regards to the extraction of unconventional gases, namely CSG (de Rijke, 2013). CSG has been extracted in Australia since the early 1990's in the arable regions on the eastern seaboard, predominantly in the Bowen and Surat Basins in Queensland (de Rijke, 2013, Petkova-Timmer et al., 2009).

The issues surrounding the extraction processes and the environmental impacts of CSG have become a matter of national and international concern, which has been heightened by the release of the controversial documentary *Gasland* in 2010 (de Rijke, 2013). Produced by Josh Fox the documentary explored the more extreme environmental implications of gas extraction (Fox, 2013). Despite being considered as a biased misrepresentation, the documentary has resulted in increased public concern on an international scale. However, this documentary centres around the extraction of shale gas in the United States and intentionally or not, the Australian public's connection between shale and CSG extraction has become blurred. *Gasland* for the first time showed the power and role of the media and discourse in influencing public opinion especially on scientific topics that the wider population often does not understand (Christen and Huberty, 2007). This raises the question as to whether the issue of CSG is being perceived in a fair and unbiased way or whether the role of the media has facilitated opposition through changing public perceptions on what is essentially a complex topic and given rise to greater environmental justice issues.

The emergence of CSG in NSW, particularly in rural regions, has been associated with significant changes in lifestyles and the complex interrelationships that comprise these communities (Walton et al., 2013). As the implications of CSG mining become apparent, local communities are faced with the advantages and disadvantages of the mining process. These affect the social, economic and environmental balance within these regional communities (Walton et al., 2013).

Currently, the site for CSG exploration in NSW is in the North West region, specifically, in the Hunter Valley. This region is comprised of a number of towns and is considered the wine and food bowl of NSW (NSW Department of Primary Industries, 2013a). Given the agricultural significance, as well as the flourishing viticulture and equine industries in the region, the exploration and possibility of CSG mining has been met with severe opposition (Hunter Valley Protection Alliance, 2013, Lock the Gate, 2013a). It has been argued that the environmental fallout from the extraction of CSG could irreparably damage to these industries that are not only vital to the livelihoods of the local communities, but also for NSW, through water and land contamination. (Hunter Valley Protection Alliance, 2013). Major concerns are concentrated around the extraction processes and the use of hydraulic fracking which, could potentially contaminate ground water sources (Hunter Valley Protection Alliance, 2013).

As such it falls to the creation and implementation of effective mitigation policy that ensures the preservation of the environment and protection of local communities. The role of the NSW government in the protection of the environment is imperative (Hunter, 2012). However, the line between the protection of the environment and the economic prosperity of the State is often blurred. Ideally, a government would solely protect and respect the interests of the local people. In reality however, the balance between State growth and environmental protection is not easily achievable (Bugler, 2012, Hunter, 2012). Therefore, attempts to create viable legislation regarding CSG requires the NSW government to include all stakeholder parties in its decision making process. Failure to do so would risk the marginalisation of groups, which, may lead to more strenuous environmental justice issues (Bugler, 2012). However, pressure from the media and activists groups often leads to the creation of ineffective, or subpar, pieces of legislation. Influences that drive the creation of policy is key to understanding how environmental justice issues arise and is explored in Chapter 6.

Despite the need to understand the influences on CSG policy creation, the majority of studies conducted on CSG in Australia has focused primarily on the contamination potential and environmental implications of the gas extraction process. There has been little research conducted on the social implications of CSG mining and the extent that any environmental implications would have on the livelihoods of the local communities in regional NSW. These communities rely on delicate industries, that rely on a pristine and stable environment, such as viticulture and thoroughbred breeding to maintain their lifestyles (Hunter Valley Protection Alliance, 2013). Changes to the environment such as the contamination of water would mean the complete breakdown of these industries and the potential collapse of societal relationships within these regional communities (de Rijke, 2013, Walton et al., 2013, Petkova-Timmer et al., 2009). Furthermore there has been no research into the role of the media and discourse in influencing public opinion which can subsequently put pressure on the government to implement policy.

Discourses focus on how language is structured and how it shapes social contexts upon which public opinions are established (Mchoul, 1991). Discourse is associated with the production of knowledge, through the use of rhetoric, stories, values and the way in which facts are presented within the media and through other discursive contexts (Mills, 1999). Regardless, of whether these facts are informed by science, technology or experience, they possess the ability to shape the way in which society perceives an issue (Mchoul, 1991). Accordingly, the role of discourse can create negative connotations toward an issue such as CSG.

The media acts as an outlet to which many groups voice their issues and concerns so that it may be heard by the wider public. Activist groups and those who are marginalised often utilise the media as a means to heighten public awareness to the environmental problems that they are facing. However, the context in which environmental issues are reported is shaped by politics, public sentiments and values, as well as, the opinion of individual reporters. Thus, facts in the media often reflect preconceived ideas shaping issues in society and the political dispositions of the writer and media organisation. By presenting facts in this manner, the media is able to shape public opinions and contribute to the production of public consensus (or dissent) around issues of governance. Thus, rhetoric and discourse are important factors in understanding how people think and talk about the environment and how controversial issues

such as CSG become public knowledge¹. Social discourses on CSG produce different framings of what is considered to be an acceptable risk to local communities and environments and what is considered to be socially and environmentally just in relation to CSG development. CSG is an interesting case study because it reveals different shades of “green” in environmental politics, and it has generated unexpected tension between environmental activists, local communities, farmers and even conservative radio announcers. It is therefore important to understand who is speaking for and against CSG, whose and what interests does this serve, and whether social discourses on CSG playing out in the media and in government policy are supporting local communities in the Hunter Valley or are further marginalising them.

This study aims to address the gaps in research on social discourses on CSG by assessing the emerging industry in NSW and its representation in government policy formation and in the media. The research will take an in-depth look into the role of the media in influencing public opinion and policy creation. With this approach, the study will seek to examine the relationship between CSG, media reporting and government policy development and examine issues of environmental injustice.

1.2 Aims and Objectives

The basis for this research project is embedded in the media and policy discourse and how they have shaped the perceptions of CSG. Furthermore, this research will explore how these discourses impact environmental justice issues, not only in the local community but in the CSG industry as well. My research will seek to address whether the policy frameworks that are being implemented, protect the people or the CSG industry. Additionally, the impact that the media and wider public of NSW are having on the decision making process will also be analysed. In addition, the research will also focus on whether the communities themselves have a voice, and whether they are being actively involved or marginalised in decision-making processes relating to CSG mining.

¹ This however, is not a one – way street. Populism often shapes the motives of media outlets as well.

Further, I will identify how CSG is being perceived in the immediate community and how these perceptions have implications for decision making. I will also consider how CSG is viewed, by activists and the media. These influence the wider NSW population as they shape the politics and the public imagination of the issue. This will be framed by asking questions such as; why do people not want it? And how are they being represented? The use of a media and discourse analysis, supplemented with a policy analysis would probe these issues to understand how opposition to CSG is being shaped (Bajkiewicz et al., 2011).

The objectives of this research address four areas:

- i. To identify what are the social implications of CSG mining and how has it impacted the community.
- ii. Examine how CSG is represented in the media and how media discourse has influenced instances of environmental injustice as well as policy creation.
- iii. Identify the role of the media in shaping public perceptions and opinions of CSG.
- iv. Examine how instances of environmental injustice have been created and impacted the local communities and CSG industry.

These objectives are designed to address gaps in academic research relating to the social implications of CSG and the role of media discourse, discussed in Chapter 2.

2. Literature Review

There is growing concern over the status of finite resources and its availability in the future. As the economy continues to expand, industry flourishes under the unregulated guise of progress (Both, 2007). It has become evident through modern science that there is a desperate need to combat extreme pollution as a by-product of industry, and the need to find effective ways to regulate and manage this waste. However, at the forefront is mitigating the loss of these resources (Both, 2007). As such, scientists are looking for alternative sources of fuel to ensure the continuation of industry and ultimately, modern technology. One alternative that has been brought to the public's attention over the past few decades has been CSG (ABC, 2013). Australia, being a heavy exporter of coal, has since joined the global trend in the exploration and mining of CSG (Australia Pacific LNG, 2013). Australian Pacific LNG is one company that discovered CSG in the Bowen Basin, Queensland, and has been mining since the early 1990s. Exploration by AGL has also commenced in NSW, generating great controversy. AGL is currently lobbying the NSW government for permission to explore and mine in the Hunter Valley region, also known as the Wine and Food Bowl of NSW (Beames, 2013).

Currently there is a gap in the literature relating to the social implications of CSG mining, with the majority of academics choosing to focus on the chemical and physical changes to the earth arising from the extraction process (Anglicare Southern Queensland, 2013). Very little research has been conducted on how CSG affects the communities and the complex interrelationships within each society. Likewise, minimal research has been conducted on food and water security of not only the immediate area, but the wider NSW population.

2.1 Issues of CSG in NSW

As the exploration for CSG in NSW continues, the controversy surrounding its extraction has led to wide spread protests, often led by the farmers whose livelihoods are at stake (Lock the Gate, 2013b). Conflicts over access to land and resources has been an ongoing battle between rural communities and mining companies, and invariably involves the distribution of power

that each industry has to persuade the greater population as to what is important (McManus and Connor, 2013). More often than not it is the rural communities that are marginalised and forced to accept the advancing interests of mining companies (Haslam McKensie et al., 2008, McManus and Connor, 2013, Vickas et al., 2015). From an economic stand point the marginalisation of rural society relates specifically to the decline in food production, loss of commercial services and threats to viticulture and industries such as thoroughbred breeding (McManus and Connor, 2013). Continual competing discourses over land use threaten the stability of rural NSW and impacts the integrity of its 'sense of place' that these communities are centred on (Shervall and Hardiman, 2014). A study carried out by Shervall and Hardiman, 2014, on the social impact of CSG on Gloucester in NSW revealed that growing tensions between mining and agriculture have greatly disturbed the idea of a 'sense of place' and has given way to the idiom of a 'countryside that is under construction'. Furthermore, they reveal that the NSW government has succumbed to the pressures of the Australia Petroleum Industry and are happy to labour under the pretence that these industries can co-exist. This despite calls from scientific experts for stricter regulations and unprecedented levels of community opposition and protest, the majority of which is headed by the Lock the Gate foundation.

The Lock the Gate foundation is leading the anti CSG movement. Created in 2010 by local community members, on the back of community meetings in NSW and Queensland, this organisation seeks to protect Australian land, water and air quality (Lock the Gate, 2013a). Firmly set against the extraction of CSG, Lock the Gate claim that the repercussions of mining this gas will be far greater than the economic worth that it would bring to NSW. They are of the strong belief that it will damage the integrity of the land and groundwater sources caused by hydraulic fracking, and the production and mismanagement of by-products of mining. Further, the foundation believes that CSG extraction will cause irreparable damage to the food and water security of the State if contamination were to occur (Lock the Gate, 2013a). They assert that CSG, once extracted and processed, will produce far greater greenhouse gas emissions than currently used fossil fuels such as coal and petroleum (Lock the Gate, 2013a).

This, however, has been disputed by mining companies as well as a number of environmental scientists (Carey, 2012, Collins, 2011, Hepburn, 2012). It is believed that although the issues relating to the food and groundwater security are relatively unknown given the lack of

detailed studies carried out on CSG mining, the gas itself would produce far less noxious chemicals as currently used fossil fuels (Roarty, 2011). In fact, it has been stated that it may be “cleaner” than natural gas, and a viable transition gas for the future green movement (Roarty, 2011). Given the state of greenhouse emissions in Australia there is a need to expand and restructure the energy industry by focusing on lower emission fuel sources. Currently Queensland is planning at least four CSG – Liquid Natural Gas (LNG) projects which would make Australia the largest exporter of LNG in the world by 2018 (Vickas et al., 2015). More, however is needed from other states, such as the establishment of other renewable energy industries like solar, to ensure that lower emission industries such as CSG can continue to grow. Currently on 5% of CSG is being produced in NSW and is a highly controversial and debated practice that is yet to gain public approval (Vickas et al., 2015).

Despite the current debate surrounding CSG, there has been a failure to research the precise effects of extraction and usage of CSG on the environment, as well as the social implications and public perceptions of its extraction (EDO, 2013). Moreover, whilst monitoring and testing the chemical changes to the environment are of extreme importance, it appears that social implications, and the effect that CSG extraction will have on people in the immediate area and wider NSW, has been disregarded (Lloyd and Luke, 2013). Even less research has been done to consider how CSG will change the complex interrelationships of the communities that will play host to the mining endeavour, and how any changes in these towns may affect NSW (Lloyd and Luke, 2013).

2.1.1 Social Implications

The threat to water and food in the Hunter Valley region is high priority, given that the water used in this region to irrigate crops is directly correlated to the amount and price of food in Sydney (ABC, 2013). The threat to food and water security have greater implications for NSW other than the obvious demise of rural communities, such as impacts to economic growth and state agricultural independence.

Yet, beyond the food and water security debate is the threat CSG mining will have on communities that will foster the mining initiative. It has been argued that such a large resources boom would bring a social change that would greatly benefit the community, by providing more jobs and a stronger sense of township amongst the people (Carrington and Pereira, 2011, Franks, 2012, Haslam McKensie et al., 2008).

Carey (2012) agrees that an endeavour such as the mining for CSG would bring a sense of prosperity to a town. However, Carey also highlights that such prosperity would be temporary, and that the implications both physically and socially would be long term. Further, when compared to Southern Queensland, NSW has a relatively small amount of available CSG. Accordingly, any damages to groundwater resources would have lasting implications for the region (Carey, 2012). Such a view has been supported by Foo (2012) and Hansan (2011), who each believe that the CSG extraction process would inevitably contaminate the groundwater, irrespective of how stringent regulations are. Foo (2012) commented that in Queensland an exclusion zone of 2km, which has now also been proposed in NSW, has no bearing on groundwater, and once it has been contaminated, the issues could be far reaching. Scientific research indicates that CSG mining practices could potentially harmful to the geological and hydrological systems upon which these rural communities rely (Shervail and Graham, 2013). This means that a short boom in industry has the potential to ruin farming practices and livelihoods of locals long after the CSG has been extracted (Petkova-Timmer et al., 2009). Ultimately, this may place these towns at risk if the region can't be rehabilitated (Petkova-Timmer et al., 2009).

2.2 Current Research - Environmental Justice and Environmentalality

2.2.1 Environmental Justice

The concept of environmental justice emerged in the United States in the 1980s. The US Environmental Protection Agency defines it as "the fair treatment and meaningful involvement of all people regardless of race, colour, sex, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies" (US EPA, 2014).

The concept of environmental justice (and its movement) in social science has gained momentum in the last few decades (Schlosberg, 2003). The increased interest in environmental justice as a form of social struggle has augmented the cause, however, has also increased the discord within the movement (Holifield, 2001). The environmental justice movement is constructed by loose coalitions of groups, each advocating for greater grassroots democracy, broader social justice, and reallocation of resources in environmental decision making and distribution of environmental rights. This means that the environmental justice movement tends to be localised, rather than global, in its outreach. This has caused the formation of disparate opinions as to the framework of environmental justice (Farrell et al., 2008). Each contingent within the movement has a specific agenda and goal that it aims to achieve. However, before any progress can be made, the movement as a whole must agree on the key issues to focus on, in order to ensure a maintained potency (Oxford University, 2013).

Further, one of the many inconsistencies in the environmental justice movement is the uniform definition of justice (Farrell et al., 2008). As such, theorists and social scientists have divided the main paradigms of justice within the environmental justice movement into three main categories: *distributive justice*, *procedural justice* and *social justice* (Schlosberg, 2004).

2.2.1.1 Definitions of Justice

a) Distributive Justice

The most commonly used concept for evaluating whether or not environmental injustice exists is distributive justice. This paradigm is frequently employed by a number of disciplines including scientists, lawyers and policy makers (Carter, 2000). It is used to analyse the relationship between a specific environmental hazard or issue, and the demographics of the population who are either in proximity to the hazard or affected by its impact (Arnold, 2011).

Distributive justice refers to the fairness by which the risks and problems of an environmental hazard are distributed among the population. It also identifies where specific demographical groups are being affected more and subsequently marginalised (Schlosberg, 2003). Potentially, this could be interpreted as indicating that burdens be distributed in relation to benefits. However, more commonly, distributive justice denotes “the right to equal treatment, that is the same distribution of goods and opportunities as anyone else has or is given” (Rechtschaffen and Gauna, 2002). In relation to the environmental justice movement, the agenda of distributive justice is, in essence, the fair treatment of all people, in terms of environmental hazard distribution. This is irrespective of their standing in society (Rechtschaffen and Gauna, 2002).

The first step in performing a distributive environmental justice analysis is to select the unit of analysis, such as demographics or a case study. However, determining which unit of analysis to use involves defining both the geographical domain and the stakeholders to be considered (Carter, 2000). Environmental justice studies typically have a number of geographical areas for the unit of analysis. Some have performed studies and research on geographical areas as large as Counties, whereas others have chosen to focus on smaller regions, concentrating on demographics considering zip codes or census tracts (Schlosberg, 2003). It is important to note however, that the scale of the study has a profound effect on the accuracy of results (Santa Clara University, 2013).

For example, consider a case study that took place in Contra Costa County in San Francisco where the unit of analysis was the entire County (Millman, 2004). The region has a higher percentage of minority groups and low-income populations than any other County in California. The area also plays host to eleven electricity-generating facilities. The distribution of these facilities shows a correlation between the minority and low-income County, and the creation of several major industrial facilities (Millman, 2004). It does not, however, directly indicate that those facilities disproportionately impact the minority and low-income residents of the County. The distribution of the minority population within the County relative to the geographical location of each of the power plants can only be understood if it is addressed at a smaller scale (Millman, 2004). A smaller scale study on townships or cities within the Contra Costa County would allow for better analysis and understanding of the spatial relationship

between the minority group and the power plants. Further, the addition of a census tract would allow for even greater detail.

b) Procedural Justice

The distribution of environmental hazards and risks is not the only method that can be used to evaluate environmental injustice issues. In fact, it seems that environmental justice activists and social scientists are more concerned with thought and decision making processes involved in the creation and implementation of policy (Haughton, 1999). This primary concern reflects the perception that the outcomes are limited by the processes behind which decisions are made.

Procedural justice relates to the fairness of the procedures that determine a specific outcome relating to an environmental hazard (Whyte, 2010). In order to fully adopt this form of environmental justice, it requires an equal concern and respect for stakeholders in the political decision making process that affect how risks and benefits are to be distributed amongst the community (Finger, 2013). Procedural justice can be used in two ways to evaluate the potential of environmental injustice (Haughton, 1999). Firstly, an ex-ante analysis evaluates the fairness of a procedure prior to its implementation and use. Secondly, an ex-post analysis evaluates whether the fairness of a procedure or decision making process, in retrospect of its completion, did in fact entail the equal consideration of the rights of all stakeholders involved (Rechtschaffen and Gauna, 2002).

Within the procedural justice framework itself, the question arises as to whether or not a fair procedure will necessarily lead to a fair and just outcome that benefits everyone. If not, this framework assesses whether a fair process can negate claims of injustice if a disproportionate outcome were to arise (Haughton, 1999). Exactly what qualifies as a fair procedure and correct decision making process is subject to interpretation, and remains ambiguous (Holifield, 2001, Whyte, 2010). Equal consideration of all stakeholders and the opportunities for them to voice their opinions and be heard by decision makers are key qualifications (Holifield, 2001). However, even if these requirements are met, a fair and balanced procedure

is not guaranteed, and there can be substantial variations in the procedures that are followed (Capek, 1993).

An example of this is the analysis of nuclear power plants in Switzerland carried out by Bruno Frey, who evaluated the acceptance of alternative siting processes. All the scenarios that Frey proposed ensured just and equal concern for all the communities that would be involved or affected. However, each followed a different process (Millman, 2004). Frey surveyed various community members and asked which siting procedure they preferred and thought would best suit them as individuals and as a community. What Frey uncovered was that the preferred procedure was negotiations between federal government and prospective host communities (Schlosberg, 2004). Despite finding that the use of negotiations was the preferred procedure, there were large variations in the responses Frey received during the study, which indicates the presence of discordant views of what really constitutes a fair and just procedure.

c) Social Justice

The social justice framework looks for “a more just ordering of society such that members of every class have enough resources and enough power to live as befits human beings” (Taylor, 2000). The foundation behind the social justice paradigm lies within the ideal that the risks and issues that an individual faces as a result of a particular endeavour, whether that be construction, mining or something else, does not occur in isolation. Rather, the “same underlying racial, economic and political factors that are responsible for environmental threats to the community also likely play a significant role in why the area may suffer from other problems” (Rechtschaffen and Gauna, 2002). Therefore, the nature of social justice calls for a more holistic approach and analysis with regards to potential environmental injustices. This includes all factors that have led up to the current hazard, and any inequitable distribution and marginalisation that may have subsequently occurred (Law, 1999). This approach requires all of the contributing factors and facets of environmental justice to work in a supportive manner, and not in a way that would lead to contradiction. Only then can an effective analysis into environmental justice issues be carried out with accurate results (Sandler, 2007).

2.3 Environmental Justice and CSG in NSW

The environmental justice paradigms in relation to CSG mining in NSW can identify if there are any injustices present, as with the aforementioned examples. Considering the issue of CSG mining through each individual justice lens will allow for a comprehensive and precise study. Given that each of these paradigms have expressed that the use of a single case study to render better results is imperative, a study of the Hunter Valley region should be an accurate representation of CSG mining in NSW.

However, the nature of the project would give rise to only three of the paradigms. Distributive justice is key to identifying the spatial distribution of the mining, whilst correlating them with the demographics of the area to identify any trends in the selection of the sites and the social status of the communities. Procedural justice will come into play through the analysis of the policy that is being implemented by the NSW government. It will allow me to see whether the process behind the decisions considers the rights of the local people, or whether it further marginalises them. Finally, social justice can be used to gauge public sentiment on the mining initiative, and whether they believe their opinions and concerns are being heard and addressed. Using this framework, I will be able to identify if any injustices are present that need to be addressed by the NSW government. However, identifying how certain words and terms such as “nature” are used and interpreted is key to understanding how instances of environmental injustice arise.

2.3.1 Defining “Nature” and “The Environment”

Discourses within environmentality fabricate disciplinary environments, which centre on the binary of power and knowledge, and define them as geo-power and eco-knowledge (Agrawal, 2005). As such, the idea of nature as a functioning entity on its own has no place in contemporary economics and governance. Thus it can be argued that nature has no explicit meaning until humans assign meanings to it through “informed” interpretation of processes (Eckersley, 1992). However, as human opinion often differs, observations of patterns within nature can be seen as bias insomuch as choosing to accentuate particular patterns and ignoring

others. Therefore, the meaning and definition of “nature” will always be multiple and inconsistent (Agrawal, 2005).

The lack of centeredness and uncertainty around the definition of nature, and in turn “environment”, is intriguing as modern contemporary ecological discourses express a variety of visions. These are based on moral values, political and cultural organisation, and social control, and accentuate the importance of solving “environmental issues” for modern society (Foucault, 1978). Accordingly, terms such as “environment,” “environmentalist” and “environmentalism” have been so excessively used and accepted as basic principles, that we are oblivious to the fact that they are more complex ideologies that have only recently come into fruition (Foucault, 1978).

Luke (1995) traces the emergence of the environment, and the growing awareness of “nature” and “the environment”, as an accepted concept by looking at the specific attention paid to environmental issues in New York media and tabloids. His analysis shows that the emergence of the environment in mainstream media in an established world city only started in the 1960s. Rachel Carson of the *New Yorker* writes an essay on how pesticides are destroying wildlife and links the topic to astronautics (a term that just 5 years previous was not registered on the index). In 1965, there are four entries including a speech by President Johnson on the need to maintain and preserve the environment. By the 1970s, Luke identifies that there are more than two full pages of citations relating to the environment and environmental problems. Within the *New York Times* paper, Luke shows the ever-increasing awareness of the environment. 1975 – one and two thirds page; 1985 – two pages; 1990 – three and a third allocated pages now encompassing a range on environmental topics such as nature, ecology, pollution, contamination and deforestation. This sudden shift in awareness highlights how discourses within politics and the media have brought to light the need to address the environment. However, as Foucault has argued, the true definitions of these keys words have been warped and changed to fit political and social agendas, thereby creating ambiguity and confusion around these now commonly used concepts.

2.3.1.1 Environmentality and Governmentality

The ideas of environmentality and governmentality were coined by Foucault which, reframe and redefine “the environment” in terms of the practice and implementation of power. Foucault’s work divides the environment into two separate, but interlinking spheres: the historical and biological. Foucault argues that throughout human history, the presence of the biological sphere, or be it the forces of nature, were considered in the form of disease and famine. These dominated human existence and brought with it a threat of death. However, the development of agricultural technologies, and advancements in medicine and healthcare, abated much of the former threat. As such, the historical, which, can be considered the will to survive, starts to envelop the biological.

Through this shift in understanding and power, humans are able to create their own definitions of “nature” and “the environment.” Thus, governmentality and the way in which, society is governed, is based on the way that humans interpret and define processes (Agrawal, 2005). We seek to control the ecological processes with the assigning of power and protection based on what we deem to be important and beneficial to us, rather than what will preserve the natural processes of the world (Agrawal, 2005, Luke, 1995).

This is highlighted by Agrawal (2005) when he travelled to the Kumaon region in India in 1985. Agrawal found that there were differing notions and ideals when the word “environment” was interpreted. It was not always seen as a way of human connectedness to the earth that needs to be protected, but rather a way of sustaining ones living at the most basic level; for example, cutting wood for fire to cook. Agrawal notes that at both ends of the spectrum (high economic process and grass roots living), the environment is seen not as an entity but a resource to be used to enhance our living. This was reinforced when Agrawal spoke to a local Indian, Hukam Singh, who said “what does it matter if all the trees are cut? There is always more forest.”

However as environmental awareness and ecological limits begin to grow, and are discovered and defined, the role of governmentality and its power is diminished. This results from the State governments, such as NSW, being forced to guarantee sustainable productivity and

advocate environmental protection through environmental protection authorities (Eckersley, 1992). Governmental discourses mobilise certain assumptions and procedures that generate “truths” that constitute power and legitimacy that vet understandings of reality in the wider public (Eckersley, 1992). These discourses have the ability to authorise or invalidate practices and concepts. Accordingly, there has been an “environmentalising” of governmental practices and regimes, shifting their focus to eco-knowledge as a way of re-operationalising governmentality as environmentality (Luke, 1995). The new ideal of environmentality is seen as an attempt by governments and transnational corporations to control environmental policy and activity globally. Specifically, the focus has been in developing countries, which is in essence the implementation of governmentality under the guise of environmental practice (Agrawal, 2005).

2.4 Previous Studies on Environmental Justice, Discourses, Environmentality and CSG

The majority of the studies relating to the mining of CSG in Australia focus primarily on the chemical and physical changes to the environment. Research conducted in this field has raised issues with the extraction process and the use of hydraulic fracking. It is viewed that hydraulic fracking has the potential to contaminate ground water sources, whether it be in the initial extraction or during the removal and storage of brackish water that is produced as a by-product of the process (Ahmed et al., 2000). Given the proposed location for its extraction in NSW, this threat has fuelled the opposition to the industry and acts as the primary concern for rural communities in the Hunter Valley (Chen, 2013, Connor et al., 2008). The contamination of groundwater has the potential to cause health problems as well as the ability to change the physical characteristics of the landscape, devastating agriculture and farming practices in the region (Collins, 2011, Connor et al., 2008, Lloyd-Smith and Senjen, 2011, Lock the Gate, 2014).

However, an independent study carried out by Dr. John Williams in 2011 on behalf of the Australian Council of Environmental Deans and Directors, argues against this notion and presents 2 key findings (Campbell, 2013). Firstly, the report identified that although CSG mining does pose a threat to groundwater, it is very minimal. Further, ways of mitigation such as aquifer replenishment and proper well decommissioning have not been properly considered

(Campbell, 2013). Secondly, it was found that the CSG mining industry should not be seen as an “evil” practice, and should be properly regulated like other industries (Campbell, 2013). Williams asserts that currently the CSG industry is moving too rapidly for legislation to keep up, and should instead adhere to legislation already implemented for mining. In addition, independent risk assessments must be carried out to respond to cumulative impacts whether they be positive or negative (Campbell, 2013).

These findings are supported by Carey (2012), who argues that whilst there may be a risk to water sources, there is insufficient information to justify these accusations. Currently, there is no national legislation that requires CSG mining companies to disclose which chemicals are used in the extraction process (Carey, 2012). Therefore, it is not possible to know the extent of damage the chemicals would have on community health, and whether these chemicals can leach through the bedrock into groundwater (Campbell, 2013).

Carey (2012) suggests that it should not be the health impacts, but the amount of water used in the extraction, that is the major issue with regards to CSG. It is understood that CSG requires a large amount of water for extraction. In NSW alone, it is estimated that 7500 gigalitres of ground water will be used over the next 25 years (Carey, 2012, Australia Pacific LNG, 2013). Therefore, questions about the risk to sustainable water management and the impacts of a rising groundwater level like salinity, should be at the forefront of political and scientific debate (Carey, 2012).

Water is a precious and much needed commodity for these rural communities, not just for drinking purposes, but for agricultural means on which their livelihoods depend. Given these communities are often remote, water is scarcely available and so it is treated with utter care and value. For a mining practice to pose even the slightest threat to these resources would render severe opposition. Claims of threats to water sources creates a highly negative image in both the immediate community and the wider public, whether or not there is any palpable evidence. The media has created an outlet to which these claims can be broadcast over large distances, further adding to the opposition. Often, the media actively highlights sensitive issues based on their own agendas and lacking proper scientific justification. This negative

influence on the wider public has the ability to change their social perceptions, and they do not necessarily possess intimate knowledge of the situation and CSG mining practices.

Given that CSG mining is a relatively new industry in Australia, there have not been many attempts to address the social implications. In the last five years there have been a few studies conducted in Queensland, but none in NSW. Furthermore, detailed research into the policy framework and the role of the media in shifting perceptions of CSG has also not been conducted in NSW. However, the need for this research is imperative, as the way in which the public views the industry will impact legislative decisions and ultimately, the future of the industry in NSW. The media plays a big part in informing the public on issues that may or may not affect them. As such, the media has a large influence on public opinion.

My research aims to fill this gap by looking at how the public perceive CSG, and which factors, such as the media, are influencing these perceptions. As part of the study, I will identify the role of the media. I will also determine whether policy and decisions are being created to protect the environment and communities, or whether there is a political agenda behind each legislative shift.

3. Study Area

3.1 The Hunter Valley Historical Overview

3.1.1 Aboriginal History and European Settlement

The Hunter Valley region of NSW, as seen in Figure 1, was first inhabited by the Wonnarua people who occupied the Upper Hunter for over 30,000 years. The Wonnarua trace their traditional roots and customs back to the early stages of the Dreaming (Wine Country, 2013). The Wonnarua consisted of 3 tribes that travelled between Sydney and the Hunter Valley, exchanging goods and performing traditional ceremonies at sacred sites along the Sydney – Hunter Corridor.

The Hunter River was first seen by European Settlers in 1797. It was an unintended discovery by Lieutenant John Shortland during a lengthy search for escaped convicts (Wine Country, 2013). Initially, the Hunter Valley was sourced for its high quality timber and coal. This was used to fuel the steamships which, provided the majority of the transport for Sydney and the surrounding areas (Wine Country, 2013). However, the subsequent discovery of the fertile soils soon gave way to a booming viticulture industry.

3.1.2 Early Vineyard History (1820 – 1900)

The construction of roads and the increase in road transport made the Hunter Valley easily accessible for new settlers. The sandy fertile flood plains of the Hunter River provided perfect conditions for a variety of agricultural endeavours. Shortly after the rivers' discovery, the arrival of the free settlers saw agricultural and pastoral activity in the region rapidly expand. It was at this point (early 1800s) that the first wine grapes were introduced in the Hunter (Tourism Australia, 2012).

By 1823, some 20 acres of vineyards had already been planted on the northern banks of the river, and what is now the Dalwood /Gresford area between Maitland and Singleton (Tourism Australia, 2012). George Wyndham of Dalwood, James King of Irrawang and William Kelman at Kirkton were the pioneers behind the Hunters' early wine making history and traditions (Wine Country, 2013).

The arrival of amateur viticulturist James Busby further cemented the wine making industry in the Hunter Valley. Busby had returned to NSW after a second tour of wine country in Europe, with a collection of 500 vine cuttings taken from prominent and private plantings. When Busby arrived in colonial NSW, he was accompanied by his sister who soon married William Kelman (Wine Country, 2013). Kelman had already established a small winery in the area now known as Morpeth. Kelman was eager to accommodate Busby's European cuttings. A replica set of these cuttings was created, and of the 500 original cuttings, 300 varieties were planted, establishing today's internationally recognised wine quality. By 1840, the Hunter Valley's registered vineyard area exceeded 500 acres.

3.1.3 Modern Vineyard History (1900 – 1970)

By the 1930s, the Pokolbin region had built a reputation for quality wine production. Several winemakers added to the Hunter Valley's reputation by exporting their products to Melbourne and Sydney (Tourism Australia, 2012, Wine Country, 2013). This was led by Maurice O'Shea, who is considered the father of Australian table wine. In addition, at Lindmans's, Ben Ean, Hans Mollenhauer and Karl Stockhausen assisted in cementing the Hunter as a premier quality wine making region.

Due to the Great Depression of the 1930s, World War I and II, and the shift in consumer preference for more fortified wines that were produced cheaper in other vineyards, the Hunter Valley suffered a major decline in vineyard activity. Nevertheless, despite great adversity and financial hardship, various wine makers such as Maurice O'Shea and the Tyrrells continued to create quality table wines. Wine merchants supported their craft and helped ensure that the quality of the Hunter Valley wines were not forgotten by the public (Wine Country, 2013). In fact, despite the harsh conditions, it is believed that some of the greatest wines produced in

the Hunter Valley came from this time period, displaying an unyielding passion for viticulture.

The 50s and 60s saw the market change yet again with popularity for fine, dry wines growing rapidly (Wine Country, 2013). This revitalised the wine industry. In 1963, Dr. Max Lake established the first new vineyard of the 1900s, Lake's Folly. A proliferation of wineries ensued, characterising the modern day Hunter Valley (Wine Country, 2013).

3.1.4 Today

The Hunter Valley today is recognised as one of Australia's most prominent and well known wine regions (Wine Country, 2013). Since its inception, the Hunter Valley has produced a plethora of quality wines that have received international recognition and merit. Currently there are over 150 wineries in the region, each producing quality white and red table wines. Of these, the Hunter Valley Semillon is the most famous, and is often compared to wine produced in Bordeaux and Champagne (Tourism Australia, 2012, Wine Country, 2013).

3.2 The Equine Industry

The equine industry in the Upper Hunter Valley is internationally acclaimed, ranked second only to Kentucky in the United States (NSW Department of Primary Industries, 2013b). It is renowned as the horse capital of Australia, due to its production of a wide variety of quality horses used for racing, and draught horses or other endurance sports such as polo. The Hunter Valley region is significant to the equine industry because of its free draining alluvial soil on the valley floors, which rise to surrounding uplands that are crucial for muscle and bone development. Furthermore the temperate climate and the lack of contamination to water sources and agricultural land makes this region ideal for the production of quality studs (NSW Department of Primary Industries, 2013b).

The industry dates back as far as 1891, with the creation of the Scone Polo Club and is also the location for the NSW Stockhorse Society (NSW Government, 2013a, NSW Government, 2013b, Tourism Australia, 2012). In recent years over \$2 billion has been invested into the

regions stud farms and horses. In 2009 – 2010 the Upper Hunter region provided 80 – 90 percent of Australia’s total value for stud horse exports, an estimated \$100 million (NSW Government, 2013b). The Upper Hunter Equine Industry is said to contribute \$2.4 billion to the NSW economy and \$5 billion to the national economy annually (NSW Government, 2013b).

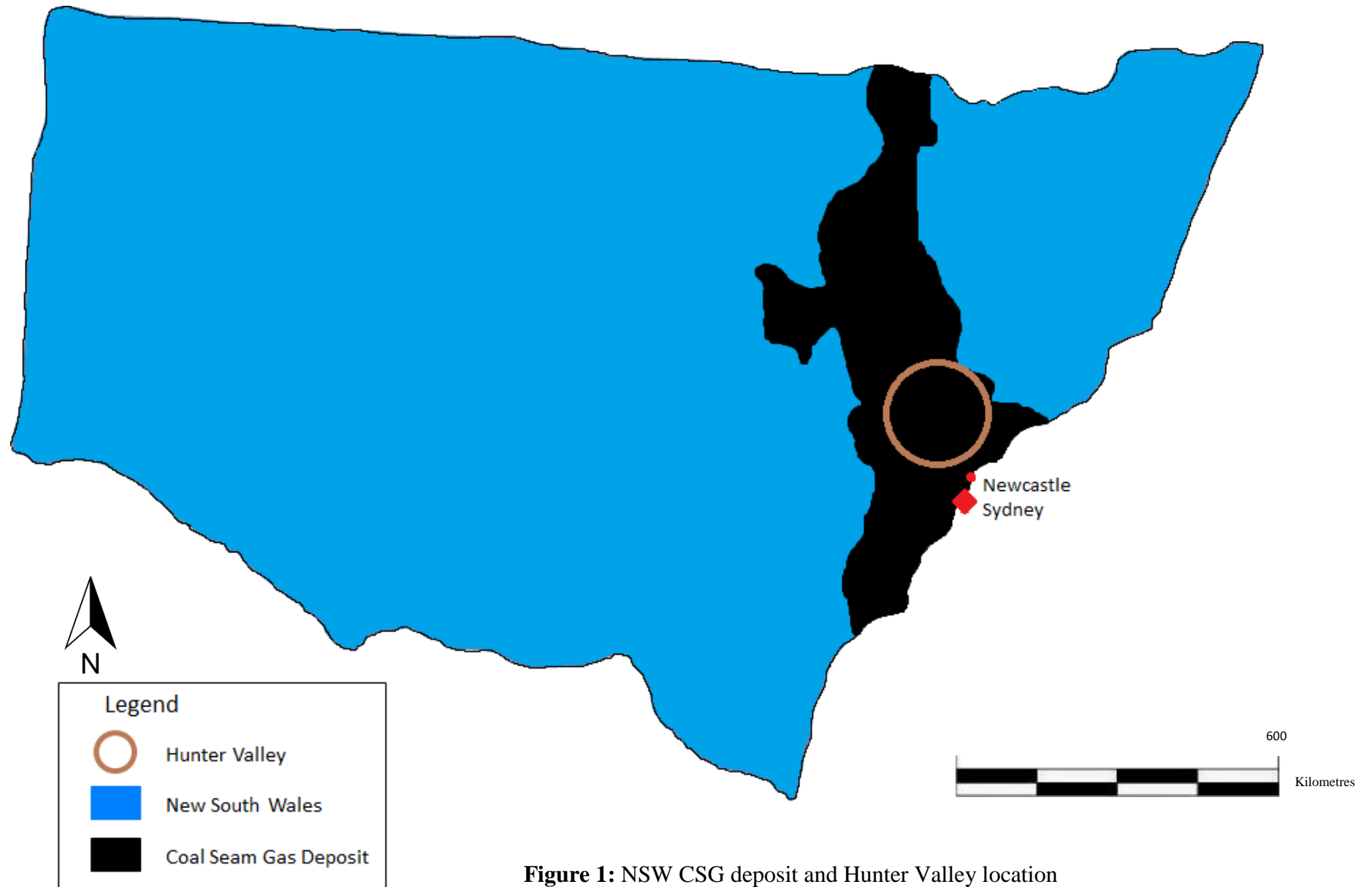


Figure 1: NSW CSG deposit and Hunter Valley location

4. Background to Coal Seam Gas

4.1 What is Coal Seam Gas

CSG is an unconventional form of natural gas that is comprised primarily of methane (up to 97%) found in coal deposits (Australia Pacific LNG, 2013). Having similar properties to natural gas, CSG can be used for cooking, heating and industrial activity (Hepburn, 2012). The gas forms and bonds to the surface of the coal particles, which are typically submerged in water, in a thin undisturbed film (Lloyd-Smith and Senjen, 2011). The water in these coal seams however, tend to be more brackish than other underground aquifers (Hepburn, 2012).

The quality of the gas within the seam is dependent on the thickness of the coal, the seams' overall depth, and its permeability (Lloyd-Smith and Senjen, 2011). High quality seams generally are permeable enough to allow for the gas and water to flow freely, and tend to be located at depths of 300 – 1000 metres (Australia Pacific LNG, 2013).

4.2 How is it Extracted?

CSG is extracted through a well that is drilled into the coal seam with a diameter of 30 centimeters (Cheng et al., 2009, Liang, 2009). A steel casing is then placed inside, which has a diameter of 20 centimeters, and cement is poured into the gap to form a barrier between the case and the well bore (Australia Pacific LNG, 2013). This ensures that there is no external interference during extraction (Australia Pacific LNG, 2013). Residual water within the bore is pumped to the surface and discarded. This reduces the pressure within the seam and allows the gas to flow through natural pathways in the rock into the well site for extraction (Cheng et al., 2009). The gas is then piped to a processing facility for quality testing and distribution (Australia Pacific LNG, 2013). The extraction process can be seen in Figure 2.

Often however, there are fewer natural pathways for the gas and water to pass through within the coal seam (Lloyd-Smith and Senjen, 2011). Essentially, this indicates that the seam is not permeable enough to allow for easy and efficient extraction. To enable extraction, the coal

seam is made porous through the pumping of a fluid composed of water, sand and chemicals. This is injected directly into the seam which forces additional pathways to open (Lloyd-Smith & Senjen, 2011). The sand within the solution ensures that the new pathways remain open and stop any geological hindrance from taking place. This is commonly known as hydraulic fracture simulation, or fracking (Lloyd-Smith & Senjen, 2011). It is this process that is the catalyst for the anti CSG movement that is currently occurring throughout Australia, and poses the greatest threat to the food and water security in NSW (Lock the Gate, 2012).

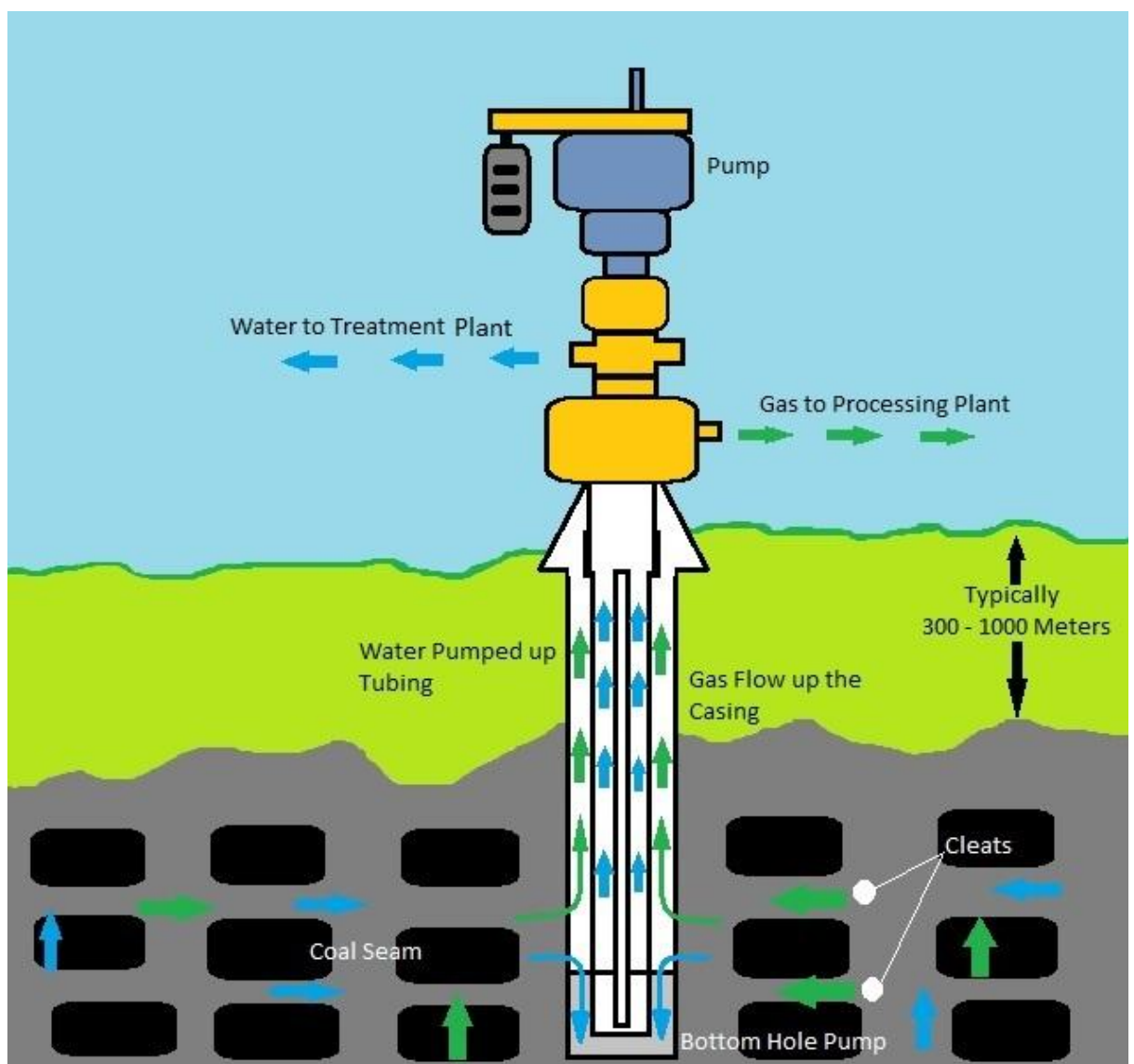


Figure 2: CSG extraction process

5. Methods: A Case Study Approach

The aim of the case study was to investigate the application of environmental justice to social perceptions and representation of CSG in the media and policy. The fundamental tools used to access this were selected based on the need to meet the project goals and include, media analysis, policy analysis, and research and analytical software such as NVivo and Factiva. This section examines the methodology used to apply and put these tools into practice. This has been broken down into a number of parts. Firstly, the reasoning behind the choice of the case study site is discussed. Included is a comprehensive triangulation of the case study research, which identifies the contributions of media, policy and community components within the study. Secondly, the use of a qualitative case study is discussed regarding the strengths and weaknesses of a stand-alone case study, as opposed to a comparative study. Furthermore, the reasoning behind the use of qualitative methods to form the basis for this study, rather than quantitative methods, is discussed.

5.1 Why the Hunter Valley?

The choice of the Hunter Valley as the focal point for this study reflects practical considerations and current debate on CSG operations in NSW. Having chosen to undertake a study into the social implications of CSG mining, the paucity of academic literature became a substantial factor in the study when looking for articles specifically pertaining to social implications in the Hunter Valley. Therefore, a wider literary scope was used to find articles on social injustice and media discourses from other studies, which were then utilised as benchmarks in my cross-reference and study of the Hunter Valley. This highlighted the marginalisation of community groups in the Hunter Valley, when the effects to the environment are considered in academic studies. Furthermore, the constant shift in CSG policy and governmental practice with regards to protecting the physical environment has led to a lack of focus in protecting the rights of the local communities and local industries, and the CSG industry.

With this context, the Hunter Valley provided the ideal location for this study. The current interest for CSG to be mined in the Hunter Valley and its potential impact on the fragile

viticulture and equine industries, has resulted in an increase in activist activity and community opposition. This allows for a comprehensive look into the social implications and perceptions of CSG in this region, the media's role in influencing public opinion, and subsequently, policy implementation.

Additionally, the selection of the Hunter Valley as a suitable area for exploration and extraction of CSG, raises concerns about the distributive nature and justice of mining. Questions are raised as to why the Hunter is being used as the key extraction site. This is particularly so given the viticulture and equine industries in the area. CSG can be extracted in safer areas closer to Sydney, such as Camden, where there is greater capacity for the proper regulation and disposal of produced water. Thus, issues of distributive justice will be analysed in the study to establish if these communities are being marginalised and the influences that have led to its selection.

5.2 Analysis Triangulation

The use of triangulation is viewed as being a key aspect of case study research. Triangulation involved the use of three key methods: the triangulation of community perceptions, media influence, and policy creation (Figure 3). This aimed to provide a comprehensive insight into how the CSG industry is perceived and how these perceptions arose. Furthermore, within this framework, the use of interviews, document analysis and media observation ensured that an informed and comprehensive study was undertaken.

The use of a single case study underlined the strong need to look at an issue from a number of differing perspectives (Hillman, 2004). Although the need to do this is often embedded in relation to the rigour and cogency of the study, the concept of a triangulation approach is not limited to correlation, but is also targeted at enhancing ones' understanding (Hillman, 2004).

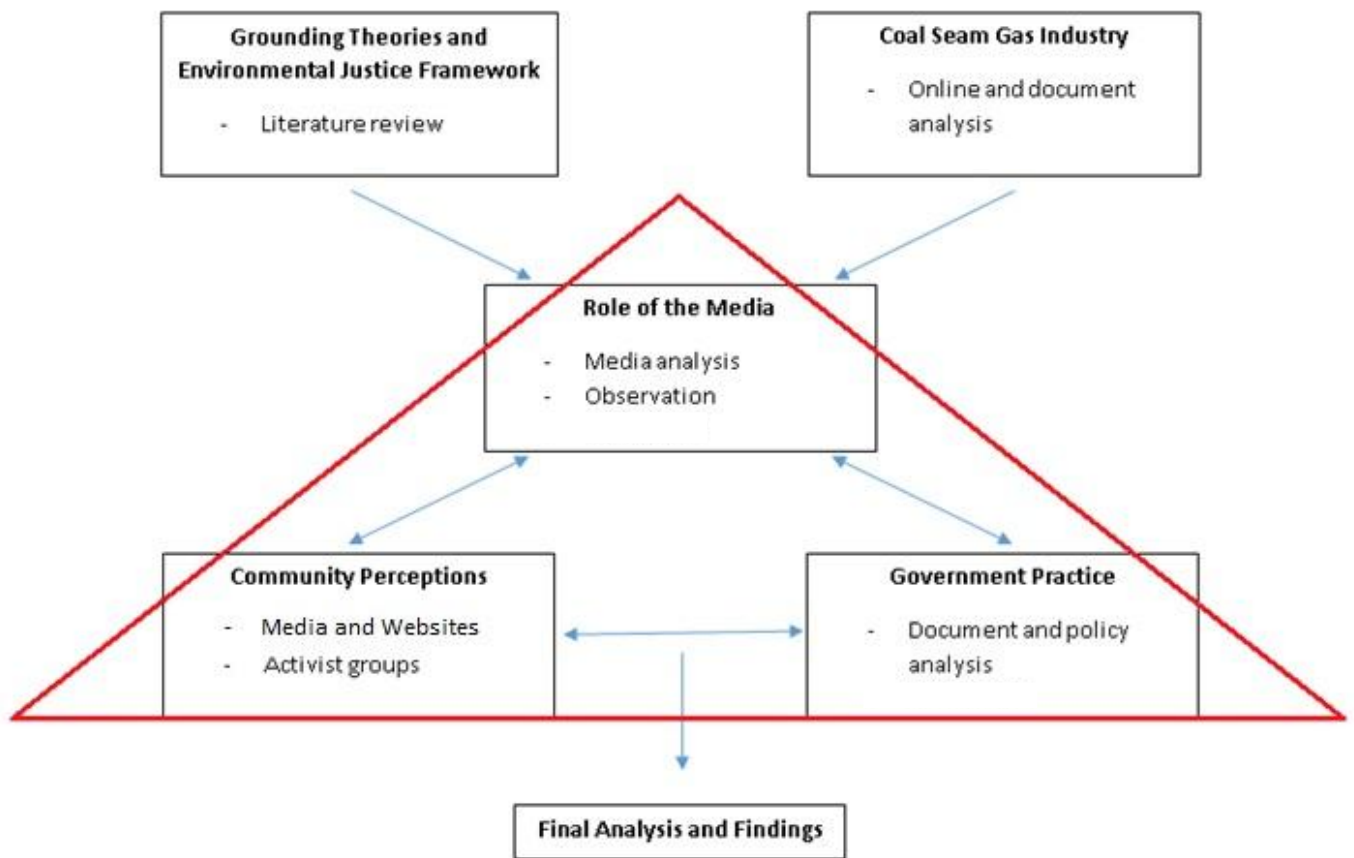


Figure 3: Research conceptual model and triangulation

5.3 Data Collection

Discourse analysis formed the basis upon which data was collected and collated for this study. Such analysis focuses on the structure of language and the creation of context through which people formulate their own opinions (Mchoul, 1991). Discourse is not responsible for the ideas and opinions themselves. Rather, it leads to the production of knowledge through the use of rhetoric and context in which facts are presented (Mills, 1999). Regardless of whether these facts are informed, they possess the ability to shape the way in which society perceives an issue. The key ideas behind discourse are largely influenced by the work of Michel Foucault (1970, 1978). Although discourses commonly refer to non-literary forms of communication, Foucault believed that a true analysis of discourse did not differentiate between literary and non-literary (Foucault, 1970). The analysis of discourse allows for questions to be raised about the integrity and justification upon which something is asserted, and the subsequent repercussions of those statements.

“Literature is the contestation of philology... it leads language back from grammar to the naked power of speech, and there it encounters the untamed, imperious being of words.” (Foucault, 1970)

Here, Foucault recognises the power of language and its ability to influence a wider population, which was then adapted by Agrawal (2005) in defining “environmentality”. The use of language is key in this project, as it informs the NSW public of the issues surrounding the CSG mining. The analysis of the discourses within the print media allows for an investigation into the impacts of writing and language (Fairclough, 1992, Frow, 1985, Kong, 2009). Discourse also shapes institutions and practices, and therefore, this study focuses on discourses produced by media outlets, activists, government and industry. First, however, one must understand what discourses are and how they feed into the knowledge and power that Foucault addresses (Johnson and Milani, 2010, Mills, 1999).

Accordingly, extensive reading into the history of discourse, and the way in which it shapes and transforms language, was undertaken. Subsequently, an analysis of key media sources in NSW using a Foucaultian framework of discourse analysis was carried out. The intention of this discourse analysis was to give insight into how information presented in the media influences and shapes the perceptions and opinions of lesser informed community members.

The language of 1520 print media articles derived from seven key print media sources was analysed to uncover the role of discourse and rhetoric in the media in relation to CSG, and its implications on environmental justice. The news database Factiva was utilised for the culmination of media articles. Factiva allowed for the specific filtering of newspaper articles to ensure that the project guidelines were met. Within the program, media articles were filtered by topic (coal seam gas) and broad location (NSW) to provide the basis of the media and discourse analysis.

Thus, as an integral part of the project, a policy analysis was carried out to identify whether any underlying issues of procedural and distributive justice exist in policy and decision making processes. Therefore, access to NSW government databases and legislation formed the backbone for this part of the data collection.

5.4 Data Analysis

To ensure that the project aims and objectives were adhered to, the purpose of the data analysis was to understand how discourses on CSG shape public perceptions of its impacts, and how different framings of CSG are utilised by different actors in the region. This also informs how social perspectives on CSG are empowered and disempowered in policy and planning frameworks, and how communities themselves act on CSG development.

In order to examine the role of media discourse in shaping public perceptions of CSG and its impact on policy creation and environmental justice, the 1520 print media articles were analysed using the program NVivo. NVivo was used as it allowed for the specific analysis of key words and text. These words are referred to as “buzzwords,” and are often used in the media to create evocative or emotive connotations. These are designed to “inform” and influence public opinion based on a preconceived agenda.

Within NVivo, the use of the ‘query’ function allowed for the coding of specific key words, shown below in Table 1, that would indicate the discourse of the media articles and highlight the central topic of the conversation.

Table 1: NVivo coding themes

Codes	Sub Codes	Reasoning
Environmental	Protection Integrity Aesthetics Human	<p>These words form the central basis for how CSG is perceived in the wider public. By coding for these words it can be understood how the media uses discourse and rhetoric to shape public perceptions. Sub codes were chosen based on their relative importance within each theme code. These sub codes highlight the important subtexts relating to the social implication of CSG.</p>
Water	Importance Livelihood Security	
Contamination	Society Mitigation Solutions	
Implications	Scope Damage Long term	
Chemical	Processes Pollution	
Justice	Procedural Distributive Fairness	
Community	Health Attitudes	
Government	Consultation Decision making Policy	

Once coded for, the program allows for the creation of word maps and trees that highlight the most commonly used words and phrases in the articles. In doing this, it represents the key topics of the articles which can then be used to ascertain whether there is bias or a balanced argument presented to the public. It indicates who the favoured groups within the article content are, and whether there is any subtext that could suggest issues of environmental justice such as location.

In addition, timelines of policy were created (Figure 6) based on NSW government databases. These timelines indicate the implementation of regulations and legislation that relate to the mining of CSG in NSW. Furthermore, a timeline of activist groups was created (Figure 4). Once created the timelines were compared to the monthly output of print media articles in Factiva. In doing so, trends between the creation of activist groups, policy and the fluctuations of media articles could be made. From this, it can be inferred that media attention to CSG is not constant, and only spikes when activist groups speak out or the government is implementing new policy.

These trends were then compared to the word frequency and text analysis compiled in NVivo. The use of evocative language and topic sentences has the potential to shift the perceptions of a reader who has no prior knowledge on the subject. By considering the media's use of language and the times of fluctuations, the media's position on the topic at a particular point in time can be understood. Accordingly, any biases can be identified. Moreover, the media will often highlight the location of the issue and whether or not the people were openly and fairly consulted prior to the implementation of a policy piece. Thus, further investigation into the environmental justice was undertaken by firstly considering the locations of the media hype, and attempting to decipher why these regions were selected for the express purpose of mining CSG by investigating the social parameters of the area. Secondly, the public consultation behind major pieces of policy was considered. Whether this was adequate or whether it marginalised the local people was then determined.

5.4.1 Policy Analysis

The basis for the policy analysis was to understand the framework behind decision making with regards to CSG, given the sensitive nature of the Hunter Valley. This analysis acted as a major supporting stage for this project. However, it proved to be the most challenging in light of constant legislative and institutional shifts due to the relatively new industry of CSG within NSW.

The initial goal was to interview members of the NSW government, or those involved in the decision making processes, and establish how local communities were being included in the thought processes behind policy creation. Unfortunately, however, no interviews were conducted as parties involved with CSG policy were reluctant to talk. As such, the project relies on the strength of publically available documents on government and departmental websites to explore implications of distributive and procedural justice. The decision to utilise this was based on the need to establish how science is portrayed in policy, and subsequently, how it is received and responded to by the general public. Despite the wide availability of government documents and related policy, the project itself would have been strengthened had there been supporting evidence provided through interviews.

6. Results and Discussion

This chapter examines how the role of the media and discourse has shaped public perception and policy creation. Furthermore, issues of environmental injustice are identified and discussed with relation to how they have been created and the impact of these injustices on the local communities of the Hunter Valley. This chapter has been divided into three sections, to better highlight how discourses have informed public opinion and their implications on the CSG debate in NSW.

6.1 Social Perspectives of CSG and the Role of the Media

The media envelops almost every facet of the modern era, playing a large role in influencing the thoughts and opinions of everyday people through the vast array of media outlets available. Yet what is portrayed to the public may not always be factually accurate. Therefore it is up to the individual to differentiate between fact and fiction (Lloyd and Luke, 2013). However, as a large proportion of the NSW population has no prior education on CSG matters, it can be difficult for the individual to do so. As such the use of discourse and rhetoric within media articles, often based upon the media's own agenda, has the potential to actively transform and shape public opinion on important matters (Fairclough, 1992).

The current pressing debate surrounding CSG in NSW has been a constant source of scrutiny for local media outlets. The position of the media has fluctuated based on the events at any given time, be it policy changes or activist activity (Christen and Huberty, 2007). It is, however, evident that the media has sought to object to the mining of CSG, and the decision making processes and policies implemented by the NSW government, based on community outcry and populism. It raises issues as to whether or not the media should be presenting an objective and balanced representation of facts. However, if it is reported and embellished in the media, someone will believe it (Bell and Garrett, 1998). If this is coupled with the ongoing pressure and constant protesting of activist groups, the issue soon appears to be rather biased. Nevertheless, members of the community will support the cause and mount pressure on a government already struggling with creating a comprehensive policy framework.

The Lock the Gate foundation has positioned themselves at the centre of the anti CSG movement, and has focussed attention on the CSG debate in NSW. The foundation was originally created in 2010, as can be seen in Figure 4, as a result of community meetings in Queensland and NSW relating to the growing pressures of mining. At this point in time, it can be seen that both Santos and AGL had vested interest in mining for CSG in NSW.

Accordingly, Lock the Gate was created and undertook the initiative to stop the mining effort. Lock the Gate claim that the repercussions of mining unconventional gas, given the techniques used for extraction, would be far greater than the economic benefit to the state (Lock the Gate, 2013a).

“Extraction will damage the integrity of the environment especially groundwater sources in NSW causing irreparable damage to the food and water security of the state.” (Lock the Gate, 2013a)

The media has become the key medium through which Lock the Gate has voiced their opinions on CSG mining. A constant stream of media releases and newspaper articles with titles such as *“The CMC rejects complaints on propriety of coal seam gas approvals (Lock the Gate, 2012)”* and *“What's Changed, Minister? Footage Reveals Macfarlane's CSG Backflip (Lock the Gate, 2012)”* has ensured that the mainstream public does not ignore their arguments. Moreover, the relationships between key people may also dictate how CSG is represented in the media. For instance, the founder and leader of Lock the Gate, Drew Hutton, is close personal friends with conservative radio commentator Alan Jones, who is known for expressing controversial views and using evocative language to influence his large public following.

“Radio broadcaster Alan Jones... suggesting the mining industry may have unduly influenced her (The Chief Scientist and Engineer of NSW) landmark report into coal seam gas.”(SMH, 2014a)

Comments such as this, from an influential commentator like Alan Jones, do influence the way in which people formulate their own opinions on an issue such as CSG. If they are led to believe that the Chief Scientist and Engineer’s report was unduly influenced by the CSG

industry, the public will not fairly consider the findings of the report and only condemn the industry further.

2005	AGL joint venture with Sydney Gas Limited to Explore the Hunter (PEL4 & 267)
2008	Santos begins exploring for CSG in Broke, NSW Hunter Valley protection Alliance formed (HPVA)
2009	AGL assumed 100% ownership of gas exploration licences as they acquired Sydney Gas Limited
2010	Lock the Gate Alliance formed Santos drills first pilot well (4) west of Gunnedah in the Pilliga region, NSW AGL books first wells for exploration in the Hunter Valley (Scone and Muswellbrook)
2011	Santos completes acquisition of Eastern Star Gas & wells in the Pilliga Stop Pilliga Coal Seam Gas group formed
2012	Wollombi Valley Against Gas Group formed Anglicare address social justice and CSG in Queensland
2013	Changes to the Environmental Planning Act (Strategic Planning Policy) AGL Camden Project revised to 0 wells at Stage 2 Most media attention on CSG in NSW in February

Legend	
	Years of heaviest public opposition to CSG and highest media attention
	Activist groups formed
	Mining company activity
	Change in major government policy

Figure 4: Timeline of organisations and public opposition

The rise and fall of media interest correlates with the interests of the mining company's attempts to secure petroleum licenses, or the decisions made by the government. This is evident when comparing Figure 5 to the timeline in Figure 6. The spike in media coverage in February 2013 is associated with changes by the NSW government to the *Environmental Planning and Assessment Act 1979* and the Strategic Planning Policy to implement a tougher licensing criteria. It is likely that these caused AGL to revise their decision to mine for CSG.

Furthermore, April 2013 saw another rise in media attention. This resulted from the fallout of the government's decision to amend the Mining State Environmental Planning Policy to incorporate a 2km buffer zone from residential and agriculturally significant land at the end of March (NSW Government, 2013a).

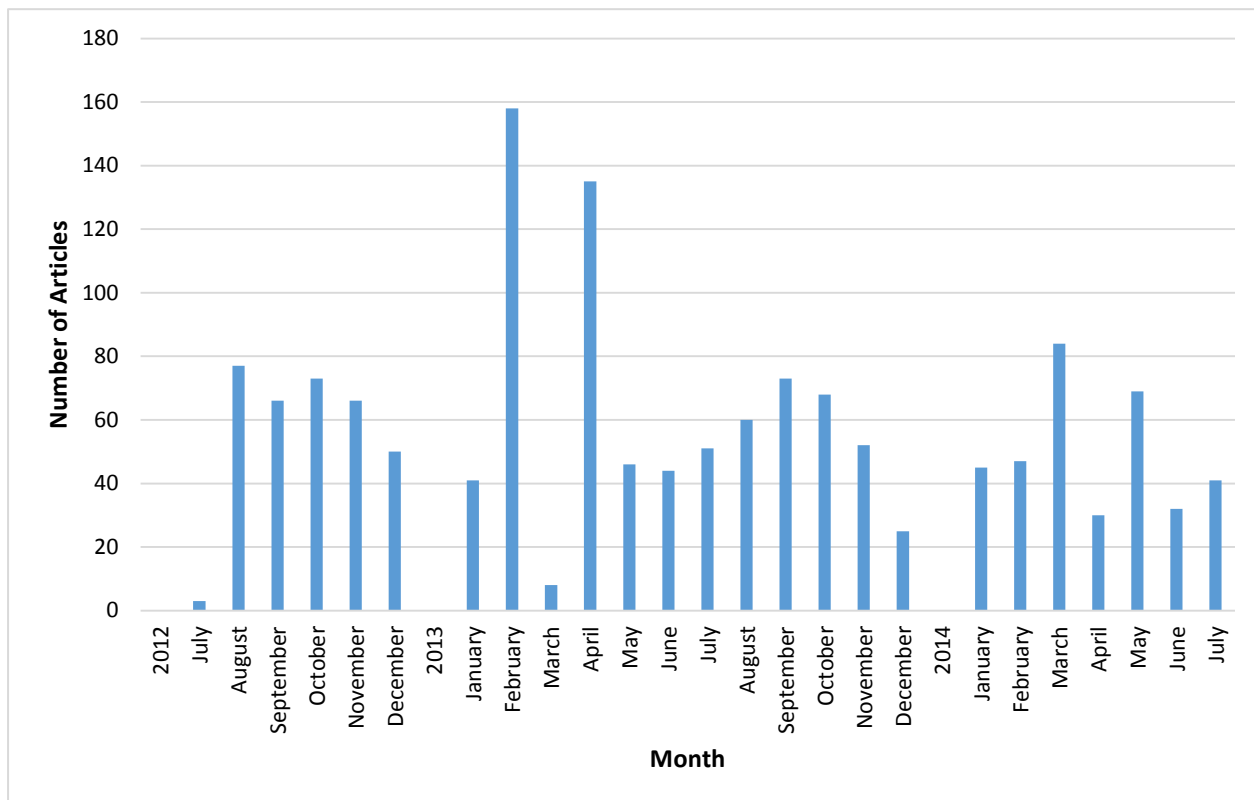


Figure 5: Monthly State and Local Print Media Articles for Pre-Selected Media Outlets for period July 2012 - July 2014

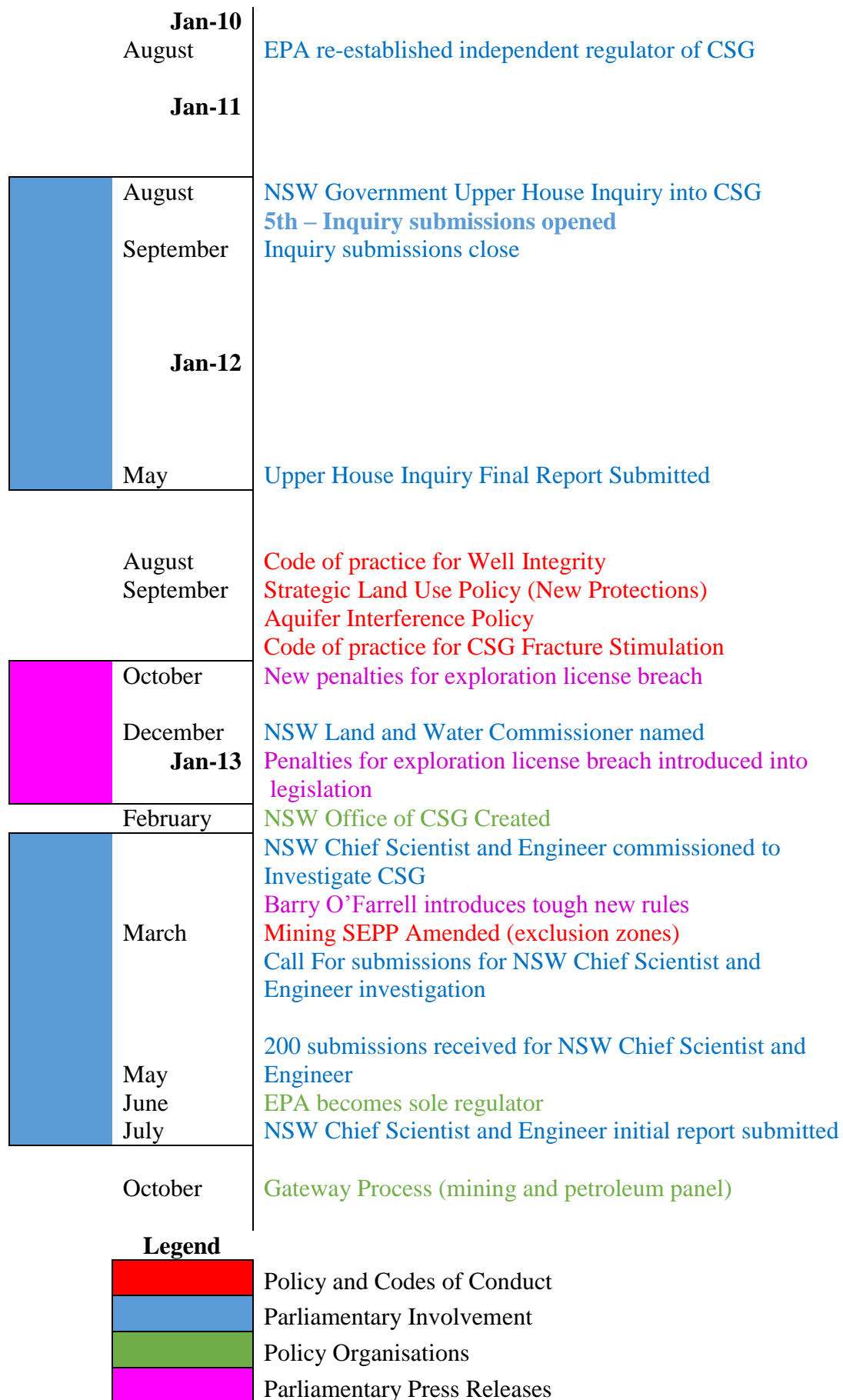


Figure 6: Timeline of NSW government policy and parliamentary action

The power of the media is often ignored in debates over CSG development. However, the media fuels opinion, and can influence public knowledge about CSG (Liang, 2013). Moreover, media reporting often blurs the distinction between facts and emotion, which in turn creates problems for understanding the science of CSG extraction, as well as issues of risk and environmental justice. For example, the technical details of CSG extraction in Australia (which are different to those in other places such as the US) can get downplayed in the media. Simultaneously, however, emotional issues such as the perceived loss of environmental security or sense of place, are heightened (Matheson, 2005). This in turn produces conflicted messages of environmental injustice. This is due to threats to rural industries and lifestyles featuring strongly in the media, whilst issues such as the cost of energy are often ignored (see Table 2, page 46).

Language and rhetoric also play a key role in how matters are portrayed in the media and then understood by the general public (Kong, 2009). There is a strong use of “buzzwords,” such as those that can be derived from the themes in Table 1 in 5.4. These are the crux of evocative language, and essentially gain the attention of the audience, regardless of the topic (Bell and Garrett, 1998). It usually only pertains to one or two key words that are used in the title of the article, and then at regular intervals throughout the news piece (Bell and Garrett, 1998). In the case of CSG, there is often excessive use of words such as ‘hydraulic fracking’, ‘groundwater’ and ‘contamination.’ The use of these words, however, is not the problem. It is the *context* in which they are used (Bell and Garrett, 1998). In the majority of cases, particularly with words bearing scientific merit, a sufficient explanation into what the phrase means and the process behind it, is not supplied (Matheson, 2005). This gives rise to misinterpretation and leads to a lesser informed public (McDonald, 2003).

However, media is not limited to news and current affairs. It also encompasses other mediums, such as documentaries (O’keeffe, 2006). Documentaries such as *Gasland* have shown the public a darker side to CSG or Shale gas mining, without a balanced and informed argument (Fox, 2013). A clip from *Gasland*, depicting the lighting of water from a kitchen tap due to gas intrusion, went viral on the internet without the proper context being explained (Fox, 2013). As a result many negative views to mining unconventional gas were formed.

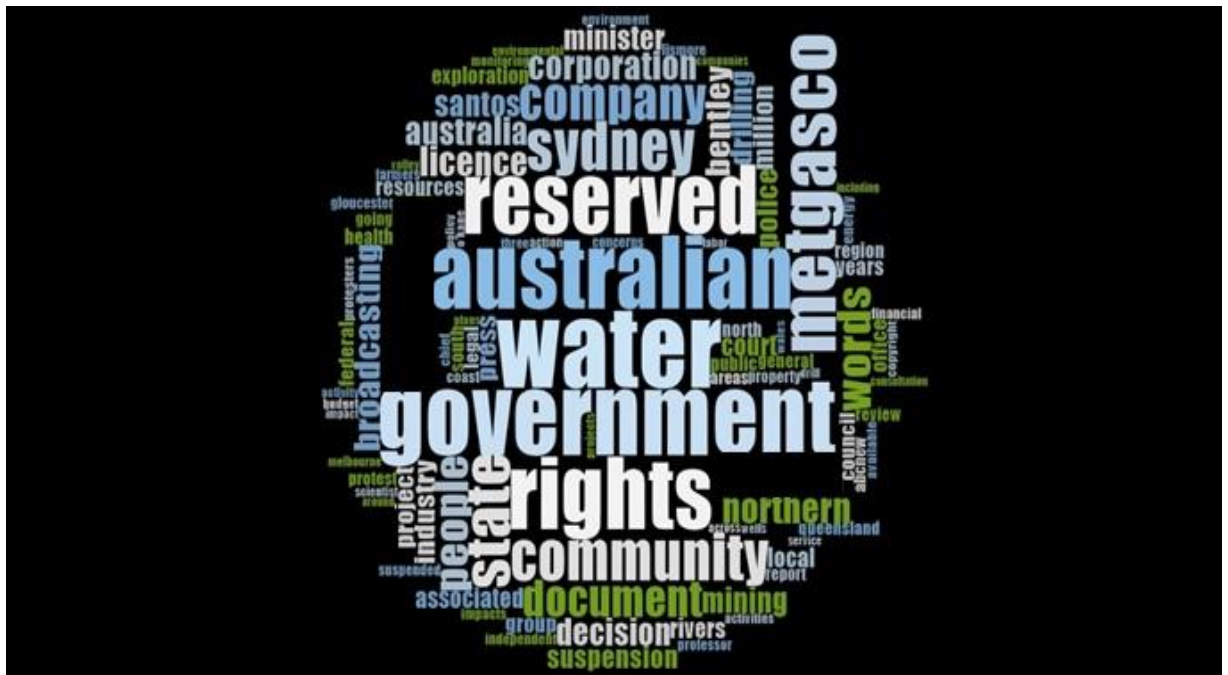
“In general, media effects are usually described as cognitive, affective or behavioural. Cognitive affects are those that concern acquisition of

information – what people learn, how beliefs are structured (restructured) in the mind, how needs for information are satisfied or not. These effects include concerns about what is learned as well as how much is learned.”
(Perse, 2001)

A large number of media articles have chosen to focus on the controversy that surrounds CSG extraction, as well as the mistakes and indecision of the NSW government. With this, there is a lesser focus on the plight and environmental injustice of local communities. Community rights however, tend to be focussed on far more greatly when the issue involves an activist group, such as the “sit-in” protest in Bentley, Northern NSW (Lock the Gate, 2013a). Over the course of a few days, the media concentrated on the struggle of the local residents. However, it is evident that in order to engage a wider audience, the media exploited the emotional situation in Bentley.

It has been quite similar in the Hunter Valley. News media has only focused on the community if there has been a major threat to an agriculturally significant industry, such as the thoroughbred industry in Scone, or when there has been a rise in activist activity (Chen, 2013). This study looked at the articles produced by 8 key print media sources² in NSW over a period of 2 years, in which a total of 1520 articles were produced. A word frequency analysis of these articles using NVivo, revealed that the bulk of the language focussed primarily on the government and environmental issues such as water. The word cloud, below in Figure 7, is a visual representation of the top 100 most frequently used words by the 8 selected print media sources. The larger words in the foreground are those most commonly used. It is clear when examining this word cloud that the focus has been mainly related to the government or environmental issues related to CSG. As such, discourses within the media, such as those invoked by these words, create knowledge that shape the perceptions of the public.

² ABC, Australian Associated Press, Northern Rivers Echo, The Land, Sydney Morning Herald, Sun Herald, Muswellbrook Chronicle and the Scone Advocate



These discourses in the media have been used to draw in a wider public audience, and highlight the struggle between the local community and the CSG industry. There will remain, however, the constant underlying question as to whether the media is using the conflict of CSG and the local community outcry as a way to bolster ratings, or whether they genuinely believe that there is a true issue that needs to be addressed (Kong, 2009). It is evident through NVivo analysis that the fluctuations in the media coverage of CSG correlates with variability in conflict and perceived interest.

When the opinions of stakeholders such as Lock the Gate are compared to industry or government officials, it is clear that there is a distinction between the unequal representations of stakeholders within the media. By concentrating on particular stakeholders and excluding or discounting the opinions of others, the media has been able to tailor the opinions of the wider public. This is to such an extent that the environmental injustices surrounding CSG targeted communities have been put aside to make way for direct attacks on the government's view on environmental integrity (Collins, 2011, De Zuniga, 2012, Eckersley, 1992, Frow, 1985). Moreover, despite responses from mining companies and environmental scientists that CSG is less polluting and may in fact be a viable green transition fuel, the media has focussed largely on public outcry and environmental degradation that may be caused by CSG if extraction were to take place in NSW (Liang, 2013).

“Santos coal seam gas project contaminates aquifer: A coal seam gas project operated by energy company Santos in north-western NSW has contaminated a nearby aquifer, with uranium at levels 20 times higher than safe drinking water guidelines, an official investigation has found.” (SMH, 2014b)

“There had also been a case in NSW where elevated levels of heavy metals and uranium were detected in water near a pond holding water produced as a by-product of gas mining. Although the food chain was not threatened in this case, it demonstrates the potential for contamination to occur, they (experts) write.”(Australian Associated Press, 2014)

Evidently, the power of the media has imprinted negative connotations of CSG mining in the minds of the wider public, despite the lack of sufficient scientific research to support their claims. The use of discourse and rhetoric has enabled the media to generate mass opposition and hysteria over environmental issues of CSG mining (Frow, 1985, Kong, 2009), with the constant undertone of government fault. As a result, this has forced the government to implement subpar policies in order to keep up with public pressure generated by media embellishment. Due to a barrage of negative press, the CSG industry has been unable to present a case as to what the industry may offer NSW in terms of economic gain. Further, it may be argued that media attention on local communities has fluctuated solely on the movements of activists rather than the actual concerns of local people. There has been a failure to recognise the importance of addressing the concerns of local individuals, not just the broader industries. Often, the concerns of these industries do not reflect the opinions of individuals within a community. As such, local communities have been further marginalised, as their concerns about the industry are discounted or manipulated in ways to advocate for the media agenda and government backlash (Fowler, 1981, O'keeffe, 2006). It is imperative that these “invisible” voices are acknowledged and considered in decision making, and are not lost in the discourses and wider issues reported in the media.

The media will only occasionally address the issues of individual locals for human interest, and often does not reflect the truths behind their real issues and concerns. The media has a right to embellish and manipulate the context in which they report, distorting the true meaning

and issues (Kong, 2009, McDonald, 2003, Mchoul, 1991). The power of the media is generated by addressing the concerns of the area as a whole in relation to local industry and activism, and subsequently how that will affect the greater Sydney population. In doing so, the media is able to portray CSG to reflect their own agendas and influence the wider public (O'keeffe, 2006). Until the NSW public and local communities in the Hunter Valley are better informed on the processes, benefits, and risks of CSG mining, the debate behind CSG and its' viability will always remain ambiguous. (Lloyd and Luke, 2013, Rana, 2013, Walton et al., 2013).

6.2 Queensland, the United States and Gasland

6.2.1 Queensland

Commercial production of CSG has been occurring in Australia since the mid-1990s. Since then, the industry has rapidly expanded with 90% of CSG being extracted from the Surat and Bowen basins in Queensland (Hamawand et al., 2013).

In 2012, a study was conducted by the University of Queensland on the how CSG is perceived and understood by the public. The study included 1007 residents aged 18 or older from the Greater Brisbane area (University of Queensland, 2012). The results indicated that there were mixed attitudes as to whether the CSG industry was having positive or negative effects on Queensland. Of the sample, 70% of people were aware about CSG extraction of which only 40% knew what CSG was used for, and 5% knew about the extraction processes and potential environmental impacts (University of Queensland, 2012).

“People who indicated that they know a lot about CSG were more likely to indicate that it is having a positive impact on Queensland. People who know only a little about CSG were more likely to indicate that it is having a negative impact on Queensland.” (University of Queensland, 2012)

The overall outcome showed that the general public was relatively uninformed about CSG. When given a number of positive and negative statements about CSG, individuals were unsure whether to agree or disagree, further indicating a lack of knowledge. Respondents

however, were interested about learning more about the industry and the environment, showing interest in environmental impacts, and impacts on people and community well-being. The study found that those who had some idea of what CSG was got the bulk of their information from TV, newspapers, and internet sources.

“People’s perceptions were being driven by stories in the media and it appears few people had been exposed to balanced, factual information.”

(University of Queensland, 2012)

The media has created a growing public concern around whether the CSG industry is being managed and regulated effectively to ensure that it is safe for people and the environment, as well as whether local land owners are being marginalised. Despite a lack of in depth knowledge on the extraction techniques and use of CSG, the study showed that the public had developed strong views, based on media influence, about the rights of farmers and how profits from CSG production should be used by the government (University of Queensland, 2012).

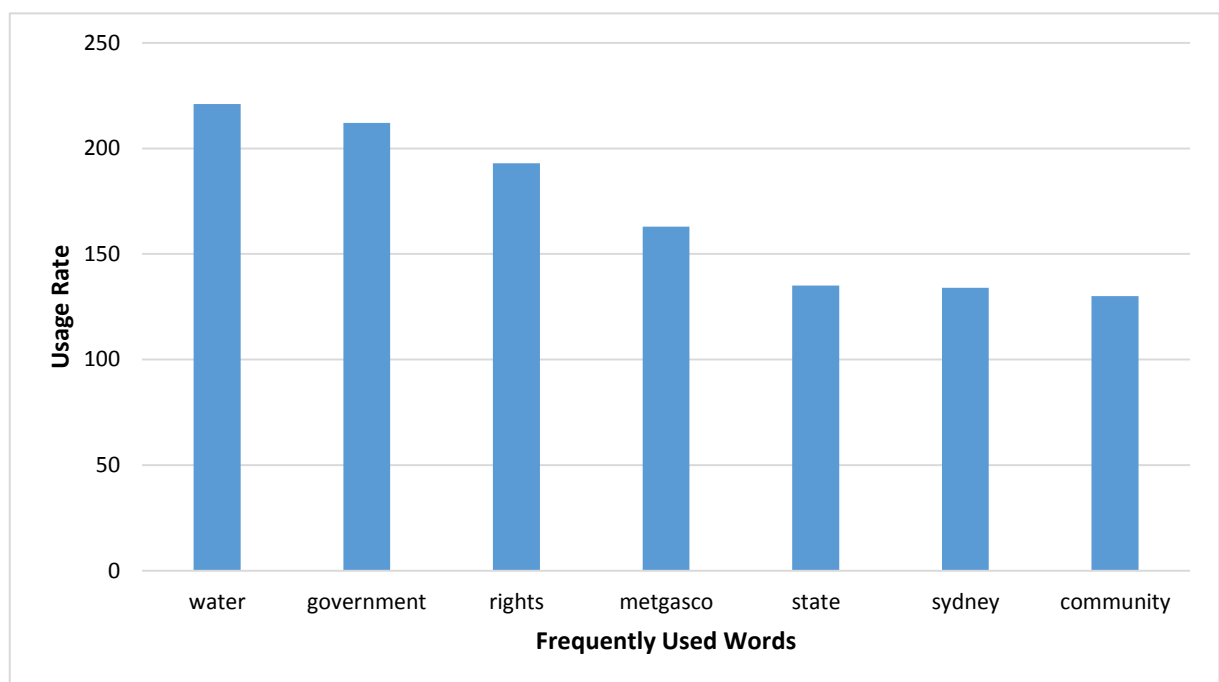


Figure 8: Top Most Frequently Used Words by the 8 Preselected Print Media Sources

The Queensland study corroborates much of the evidence that has been uncovered during this research of social perception of CSG in the Hunter Valley. It is evident that the media has a far reaching influence on the development of the wider public's opinions and ideals. Much the same as the Queensland case study, the role of the media and its influence over the public is growing based on the use of evocative language, discourse and rhetoric. Figure 8 displays the top most commonly used words by the 8 print media sources selected for this study. It highlights the key type of language used by the media to secure the full unwavering attention of their readership. Furthermore, through the use of this evocative language, the media imprints an ideal into the minds of a lesser informed public audience. Words such as 'water', 'government' and 'rights' are important key words when discussing CSG. However, in the wrong context, they can transform the meaning of a phrase or article.

Moreover, the frequency and continual use of these words and themes can embed and create ideas within a readers' mind (Frow, 1985). This is evident when comparing Figure 8 to Table 1 in Section 5.4. Table 1 represents key themes selected by myself as aspects for investigation in the media. The NVivo analysis, of the 1520 print media articles, revealed that key themes such as 'water' and the 'government' were used frequently in the media. The results from the NVivo analysis are summarised in Table 2 below, depicting the common and recurrent themes that have been used by the media over the past two years, the most common of which are highlighted. The text analysis results in Figure 8, which were derived from the 1520 articles, showed that the themes as words themselves were also used habitually. In doing so, the repetition of these themes allows for the creation of knowledge based on any agenda as set by the media.

Table 2: NVivo analysis results

<u>Codes</u>	<u>Count</u>	<u>Sub Codes</u>	<u>Count</u>
Environmental	30	Protection	9
		Integrity	2
		Aesthetics	0
		Human	9
Water	221	Importance	3
		Livelihood	2
		Security	13
Contamination	15	Society	6
		Mitigation	0
		Solutions	6
Implications	3	Scope	0
		Damage	13
		Long term	50
Chemical	3	Processes	6
		Pollution	4
Justice	6	Procedural	6
		Distributive	0
		Fairness	7
Community	130	Health	45
		Attitudes	2
Government	212	Consultation	28
		Decision making	4
		Policy	30

The words in Figure 8 themselves, create context by which a reader can be swayed. The continual reference to the mining company, Metgasco, along with a specific geographic location such as Sydney, and a major issue such as water, provide the platform upon which a media source can create a compelling topical article. This has the “shock value” to create enough fear to change the wider public’s perceptions on an issue such as CSG. In addition, the sub codes highlighted in green in Table 2, express the underlying subtext in media articles relating to the need to implement longer term decision making. These themes indicate key

areas that are perceived by the public and media that need to be addressed in the NSW political framework and regulation of CSG, prior to any approval for extraction being granted. However, many of these themes contained within the media are a product of discourse (Matheson, 2005), and are influenced by external case studies such as Queensland and the United States.

6.2.2 United States and *Gasland*

A common rising theme throughout media publications over the last 2 years is the inclusion of issues and debates from the United States. Environmental outfall from unconventional gas production from the US has been a focal point of many arguments and press releases made by activist groups in NSW. The use of hydraulic fracturing technology has secured further energy resources in the US (Jenkins and Boyer, 2008, King, 2010). Yet it is this technology that has sparked major outcry from the public in the US, which has filtered as “evidence” into the Hunter Valley debate. Unconventional gas production in the US however, is not the same as CSG production in the Hunter Valley, despite the common use of hydraulic fracturing (Jenkins and Boyer, 2008).

Despite the presence of CSG, the majority of unconventional gas production in the US is shale gas. What differentiates shale gas from CSG is that it is typically found at depths of 1000 to over 2000 metres in low permeability sedimentary rock (Rutovitz et al., 2011). Shale is much harder than coal, and thus is more impermeable. Therefore, its extraction always requires hydraulic fracturing. To gain maximum exposure to the shale deposit, drillers generally employ a combination of vertical and horizontal drilling techniques. This is unlike CSG production in Australia, which only employs vertical drilling. The water and chemicals used to frack the shale seam has to be pumped at a higher velocity than when hydraulically fracking a coal seam (Rutovitz et al., 2011). This, combined with variable drilling techniques, leaves greater scope for environmental contamination (Jenkins and Boyer, 2008, King, 2010, Parliament of Victoria, 2013). Regardless of these differences, the contamination of lands in the US has found its way into the NSW media, which has framed it as a comparable story to CSG in the Hunter Valley. This is without framing the correct context, and without conveying vital information that differentiates the industries.

In addition, local activist groups were involved in bringing an anti-fracking activist from the US for a tour between February and March 2014. The express goal was to inform the media, decision makers, and other audiences of the environmental implications of hydraulic fracking. This action was a purely emotive response, designed to support the arguments of activist groups such as Lock the Gate, and subjugate any actions by the government or the CSG industry. The fact that many of the sites discussed were shale gas sites was not mentioned by organisers or the media (Phillips, 2014). Again, vital evidence for the public was excluded, thereby creating a different factual tone and agenda. Furthermore, the allure to attend the lecture was the fact that the activist appeared in the *Gasland* documentary movie released in 2010 (Phillips, 2014).

Gasland has had a large role in shaping the perceptions of CSG extraction in NSW. The movie depicts graphic visual images of the environmental degradation relating to the hydraulic fracking of unconventional gas reserves. The most evocative of these relates to a man turning on a tap and exposing it to a match, which ignites natural gas that dissolved in the water. This single scene had the ability to embed itself into the minds of the public, to the extent where it has become the main point of reference for the lesser informed public about CSG mining. These types of scenes create negative connotations about the mining of CSG before a person can learn more about the industry, its advantages and disadvantages. This hinders the ability of the public to formulate their own opinions due to a preconceived attitude. Furthermore, unbeknown to the public, this powerful scene in *Gasland* was in fact untrue (Colorado Department of Natural Resources, 2008).

"There are no indications of any oil & gas related impacts to your well water." (Colorado Department of Natural Resources, 2008)

It was found that the dissolved gas was naturally occurring, and the water well used to supply his home with water had in fact penetrated several coal beds that had then released methane into the well (Colorado Department of Natural Resources, 2008). Despite this, media sources embellished the findings of *Gasland*. It was contextualised such that it is considered as perceived truth on the impacts, both socially and environmentally, that CSG mining will have on the Hunter Valley.

6.3 Environmental Justice

The way the public perceives and understands environmental justice is essential to how an individual or a community responds to a sensitive industry such as CSG. Differing ideals and opinions of processes can complicate the way policy is created, and the decisions behind their implementation, creating serious management and regulatory issues (Hillman, 2004). In relation to CSG, these issues typically arise from contested conceptions of land use, health and economic prosperity. Previously, the thoughts and procedural processes regarding land use and land use policy were dominated by the government and rural landholders. However, the rise in media attention on environmental issues over the last 10 years, and the way that environmental issues are presented, has incorporated the wider public into the debate on acceptable land use practice and environmental protection. In NSW, there appears to be a declining trend since 2012 as to the perceived importance of the environment as a political issue (EPA, 2013). Simultaneously, there is an increasing use of environmental issues by the media to attack and discredit the government. It is clear that the debate surrounding the exploration and extraction of CSG in the Hunter Valley concentrates heavily on environmental injustices that have arisen in the media and governmental practices.

6.3.1 Justice for all?

Environmental justice is a principle theme of this case study, and the stepping stone to establishing a more participatory approach to the management of CSG and the protection of local communities. What has become evident throughout this study is the need to address two major areas of environmental justice: distributive and procedural justice. Distributive justice pertains to the fairness of where CSG will be mined in NSW, and the reasoning behind the regions' selection (Capek, 1993). Procedural justice goes beyond this. It considers who should have a voice in the regulatory process, and how decisions behind the policy framework are made (Finger, 2013, Haughton, 1999, Holifield, 2001). In essence, it seeks to investigate whether it is inclusive or exclusive of all stakeholders, whether they be community members or the CSG industry (Holifield, 2001).

There are growing notions of environmentality and governmentality that add to the complications with decision making and policy creation. This relates to the creation of definitions of what we perceive comprises “nature” and the “environment”, which ultimately dictates how we govern and regulate our activities to protect them (Agrawal, 2005). In the case of the Hunter Valley, we assign the protection to the physical environment but not the social environment, creating procedural and social injustices during decision making processes (Agrawal, 2005). This results in the marginalisation of local communities. Governments and media discourses can invoke certain assumptions that generate “truths”, constructing legitimacy of understandings in the wider community (Foucault, 1970). This is clear when examining how the public perceives and responds to the mining of CSG in the Hunter Valley. The discourses in the media have created negative connotations of CSG mining. When combined with activists and evocative movies like *Gasland*, such discourses have driven public opinion, even if the processes are not properly understood (Eckersley, 1992). As the public become increasingly informed on the issues through the media and activists, whether with or without true facts, the role of governmentality is weakened. Thus, the government is forced to guarantee sustainable productivity by way of legislation (Bell and Garrett, 1998, Fairclough, 1992, Frow, 1985, Kong, 2009), which is vetted by inadequate scientific justification that cannot operate long term, such as the amendments to the Mining State Environmental Planning Policy (NSW Government, 2013a, NSW Government, 2013b). These complications are the foundations upon which distributive and procedural injustice is built.

Currently, the NSW regulatory framework for CSG mandates a two-stage approval process. The first stage is being in possession of Petroleum Production Lease pursuant to the *Petroleum (Onshore) Act 1991* (NSW). The second stage is the development consent required under the *Environment Planning and Assessment Act 1979* (NSW), prior to an exploration lease being granted (Rana, 2013). Furthermore the Minister for Resources and Energy has the authority to grant a PPL under the *Petroleum (Onshore) Act 1991* (NSW). If the proponent of the exploration lease owns the land, then they are prima facie approved by the Minister. However, despite the *Petroleum (Onshore) Act 1991* (NSW) not including a need to ‘have a regard’ or ‘consider’ the principles of ecologically sustainable development, it does require the Minister to consider environmental impacts prior to granting a title to the proponent (Rana, 2013).

In NSW, policy creation and implementation seems to be entering a stage of reacting to the stakeholder and/or public outcry. This creates a perceived lack of outcomes in relation to concrete decision making and policy implementation. Thus, the NSW government has focussed on the advice of smaller panels of experts to deliver policy that will suit the needs of all stakeholders, when realistically this is not achievable. This intuitional turnaround reflects tension within the Hunter Valley and wider NSW, and their perceptions of procedural justice. The community appears to be frustrated over the lack of effective regulatory plans, and desires a more broader-based decision making process. In the long term, this would not benefit any stakeholder given the nature of the industrial processes in extracting CSG, and the sensitivity of the Hunter Valley region. Given the state of current legislation and constant repealing and reformation of policy, the experiment to attempt to regulate CSG through separate governing bodies and committees is currently ineffective.

There is a lack of consensus and capacity building between the governing bodies and stakeholders, as to what the correct course of action should be to regulate CSG if extraction is to occur in the Hunter Valley. As well, there is a lack of consensus about the protections needed for the environment and local communities. Furthermore, the NSW government have been put under increasing pressure in the Hunter Valley from land holders and other stakeholders. Growing concerns around the impacts to their livelihoods have been raised, considering that environmental risk modelling has failed to deliver viable solutions to mitigate issues within the correct political timeframe. Accordingly, the government has been forced to change existing processes, and have radically changed the political policy framework system. This drastic change presents major difficulties when attempting to generate community participation, and a community based management system, that provides protection to the environment and prevents any social implications in local communities. What this study has revealed is that constant changes and reactions from the NSW government are born from the separation of distributive and procedural justice (Finger, 2013, Haughton, 1999, Lloyd and Luke, 2013).

Much of this study looks at the environment justice issues surrounding local communities and the wider public, as influenced by the media or government. However, this study has uncovered that there are justice issues that relate to mining companies as well. Procedural processes that have influenced the creation of policy have hindered the progression of the

CSG industry. This is only, in part, because of public and media pressure. The viticulture, equine and coal industries in the Hunter Valley are long established and have ties to various influential people and governing bodies. Such contacts have the potential to influence the way in which policy is mandated. Similar to the way that policy has not being inclusive of the public, there are issues of procedural justice with regards to how the CSG industry is being represented in the policy creation process.

Moreover, given the industry youth in NSW and the propensity for the NSW government to alter policy, the scope for influence over its regulation is far greater than in Queensland, where the industry is established. A key example of this is the creation of the Aquifer Interference Policy in 2012 (NSW Government, 2013a), as seen in Figure 6. Changes in water licencing and industry use regulation have occurred following the protests from the viticulture and equine industries and their proponents. This is to ensure that water security is maintained for their respective industries, regardless of the hindrance to the newer CSG industry. Furthermore, elements of distributive justice come into place when you examine the locality of the CSG proposed industry. Given that the Hunter Valley is considered the ‘Wine and Agricultural Bowl of NSW’, the introduction of what has been dubbed a “*dirty*” industry by the media has not gained public support. This is despite the fact that the coal industry has been operating in the same region for decades. However, the introduction of new mining techniques into what is viewed by the wider NSW population as a significant and sensitive area, has been a considerable factor in the opposition to CSG and the justice issues pertaining to the industry itself.

6.3.2 The Hunter Valley: Not Only Important to the Community

Historically, the Hunter Valley region has always played a large part in the mining industry of the Australian economy. Coal mining has been an integral part of the history and culture of the Hunter Valley, providing employment and developing thriving communities (Tourism Australia, 2012). The coal industry itself has seen some opposition in recent years over mining procedure, however the vast majority of community outcry has surfaced with the growing presence of CSG (Connor et al., 2008). It is evident that although both forms of energy are derived from coal beds, regulatory procedures used for coal mining cannot be

applied to CSG mining. Thus, a separation as to how new regulations should be created and implemented has occurred.

An ever increasing emphasis on the need for procedural justice has seen the quick transition from a more top-down decision making process, to a more experimental one that focuses on rehabilitation rather than mitigation (Eckersley, 1992). In addition, issues behind the selection of the Hunter Valley as the primary CSG site are present, given that there is access to CSG deposits in the more suburban areas of Sydney. The local communities feel that they have been marginalised and targeted based on the lower density of their population, and the lesser likelihood for opposition (Foster, 1998). However, the government and policy makers have overlooked the fact that place matters, not only for the extraction of CSG, but for the local communities (Foster, 1998, Holifield, 2001, Law, 1999, Lloyd and Luke, 2013). These communities' livelihoods rely upon fragile industries that drive their communities, and much of the NSW and Australian economy.

The Hunter Valley is renowned for more than it's internationally acclaimed wines. Scone is the thoroughbred capital of Australia, and a major global competitor on supplying quality horses for show and racing, generating over \$100 million annually for the Australian economy (Tourism Australia, 2012, Wine Country, 2013, NSW Department of Primary Industries, 2013b). Additionally, the fertile nature of the Liverpool plains has created a major 'food bowl' that supplies quality fresh food to NSW communities, including Sydney. These industries hinge on a well maintained pristine environment to ensure a continuation of quality produce. Minor changes to the environment can have devastating implications for these industries and the communities that rely so heavily upon them. Therefore, the question being asked by the public is, if this region is so important, why would the government risk its degradation with what can only be described as a short term energy industry? It is clear that there is a strong element of distributive injustice that is taking place in relation to the mining of CSG in the Hunter. Furthermore, given that CSG can be mined in outer Sydney with the same ease of access as in the Hunter Valley, it is clear that both the government and CSG industry attempted to gain access to CSG through the "path of least resistance" when selecting the Hunter Valley as the primary exploration and extraction point (Capek, 1993, Foster, 1998).

The dichotomy of procedural and distributive justice can be seen in the content of the media articles, and in the movements of activist groups against the extraction of CSG in the Hunter Valley (Eckersley, 1992, Matheson, 2005, McDonald, 2003, Mchoul, 1991). Majority would contend, however, that an increase in participation in the governance and regulation of environmental matters regarding CSG would not deliver effective management outcomes without the presence of comprehensive scientific justification (Eckersley, 1992). An example of this was the amendment to the Mining State Environmental Planning Policy, stating that a 2km buffer zone be applied to all CSG mining operations that were to operate in proximity to suburban areas. However, this was implemented without sufficient scientific research, and has subsequently been repealed (NSW Government, 2013a). Recent changes such as these highlight that there is a current deficit in what is intrinsically important, and what should be contained and protected within legislation. Identifying these key elements is necessary to achieve effective environmental and social management (Hillman, 2004).

This creates doubt upon the longevity and resilience of recent NSW legislative reforms, as well as the overall equity of the outcomes of the policy implementation (Hillman, 2004). Moreover, the constant pressure from the media and activist groups that drive public opinion, have played a major role in forcing the government to implement subpar policies and regulatory frameworks (Frow, 1985, Mchoul, 1991, Perse, 2001). This obvious tension between the need for policy reform, the need to ensure procedural justice to eliminate community and industrial marginalisation, and the constant public pressure driven by the media and activist groups, reflects the urgency and scale of the task at hand (Fowler, 1981, Rose and Miller, 1992).

Local communities have been depicted in the media as the victims of CSG exploration. Often, despite local community groups being mentioned in the media, it is the threats to local industries like viticulture and equine that feature in these articles. Environmental justice is an important driver for procedural and social equity. However, what this study has revealed is that there are “invisible” voices of local individuals and families, whose concerns centre on the preservation of their livelihoods. These voices are being lost amongst the attention on how procedural and distributive justice can resolve issues for local industry and policy reform. Most would contend that if you solve these issues, then the individual will also be protected. This is not necessarily the case.

Organisations like Lock the Gate, despite fighting for community rights, do not always represent the views or opinions of all local communities. This is something that needs to be recognised in decision making. Activist groups and local industry, contrary to popular belief, possess significant power and influence in politics, and it is their interests that are currently being framed in environmental justice. Environmental justice cannot just address the obvious issues or those created by media discourse. It must encompass all facts of local community, industry, and politics, including the “invisible” voices. This is a complex and difficult undertaking, however it is essential to limiting the marginalisation of stakeholders.

Nevertheless, if the NSW government is to implement effective policy and properly regulate the CSG industry with minimal environmental and social impact, there is a need for the active engagement and inclusion of local communities. Further, it is crucial that there is adequate community consultation to ensure that these community groups are able to voice their concerns to decision makers, and are better informed on the processes of CSG, its potential impacts, and how it may affect their livelihoods. If this occurs, the impacts of media discourse and its influence on local community will be considerably diminished (Capek, 1993).

7. Conclusion

The pursuit of environmental justice is equated with the need to have a balanced outcome that addresses all perceived inequities, and that seeks to establish stability between the social, environmental and political paradigms. The lack of consensus on the regulation of CSG in NSW indicates a need to understand how knowledge about nature is socially produced. The term “nature” needs to encompass both the physical environment *and* the social systems in the community. This broader understanding of nature needs to then be mirrored in decision making and policy implementation, including how decisions are disseminated to the broader community.

However, as discussed, media discourse is currently shaping public opinion and driving opposition to CSG. The presentation of CSG in the media, as shown in the analysis, has concentrated on the disadvantages of the industry. Moreover, a reliable readership is ensured through the use of key discourses such as “water” and “contamination”. The power of the media, and the increasing pressure on the NSW government to appease all stakeholders, has led to procedural and distributive injustices in the Hunter Valley. This is evidenced through the constant changes to the CSG political framework and regulations. Further, this research uncovered that these injustices also apply to the CSG industry. This is particularly through the creation of policy, based on mounting community opposition and the political power of the viticulture and equine industries, rather than informed scientific decision making.

To eliminate instances of injustice, the NSW government must ensure that the community is properly informed. This will disempower any misleading information in the media, on both the advantages and disadvantages of the CSG industry. Further, the need for active community engagement in the decision making process is imperative if effective management and regulation of CSG is to occur. This study has revealed gaps in the political framework that surrounds CSG, and the lack of understanding and tolerance for an industry whose “dirty” image is driven by the media.

As Queensland has demonstrated in the Surat and Bowen basins, the capacity for effective regulation and extraction of CSG is achievable by recognising that there are multiple

objectives the State must consider in supporting and regulating the industry. Such an approach can exist in NSW, and specifically in the Hunter Valley. However, from a political, social, industrial, and environmental standpoint, there is low confidence and trust by and within each of these sectors. To assist further, research must be conducted on the social and environmental impacts the CSG industry will have on the Hunter Valley, and more broadly across NSW. Moreover, due to the tenuous characteristic of the Hunter Valley's local industries, that juxtaposes coal mining against viticulture and horse breeding, studies must be conducted to identify the ideal socially and environmentally suitable areas in NSW to extract CSG.

Until an effective policy framework is created, and the discourses in the media are countered with sound facts and research, CSG mining should not take place in the Hunter Valley. This will ensure that instances of environmental injustice are diminished, and that there is effective regulation and protection of the industry, community and environment. Good and balanced policy must seek to recognise the various interests and positions of stakeholders, as well as the regional setting of CSG mining.

The Final Report of the Independent Review of Coal Seam Gas Activities in NSW, published by the Chief Scientist and Engineer of NSW³, revealed similar findings to this study. It concluded that there were serious stakeholder concerns surrounding the process of hydraulic fracking, and its potential to contaminate water sources. There is a perception in parts of the community that CSG extraction is more damaging to the environment than other extractive industries, which was highlighted in the social perceptions of this research. Moreover, local communities have strong affinities with their land, and its central role in their livelihood. The report expressed a lack of trust between members of the community toward industry representatives and government officials. This is concurrent with the findings of this study. However, this study showed that the lack of trust is largely driven by media influence.

The Chief Scientist and Engineers' report, did not identify the role of the media and the influence of discourse on public perceptions of CSG that were uncovered in this study. As shown, community interest groups such as Lock the Gate, possess a great deal of power with

³ This report was published 1 week prior to this thesis being submitted and has not been analysed in the discussion

regards to the media and the context in which things are reported. Key interest groups are frequently quoted, and are positioned in media articles as having authoritative positions on policy and decision making, arguably over and above that of experts and government officials.

Who has had the greater role on the policy affecting CSG remains a point of contention, and is central to the concept of environmental justice. While community groups have a persuasive impact on media coverage, key industries such as the viticulture and equine arguably have played an important role in the Hunter Valley in limiting, and in some cases excluding, CSG at a policy level. It is these powers and discourses that shape the way in which CSG is perceived by the local community, and whether instances of procedural and distributive justice arise. As such, these powers and the need to effectively inform the public on CSG, must be addressed by the NSW government in its consideration of the Chief Scientist and Engineers' report. Environmental justice issues must form the basis for the balanced treatment of all stakeholder groups.

8. References

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9. Appendices

<u>Federal and State Policy Frameworks and Regulators of Coal Seam Gas</u>			
Government Level	Description of the Policy or Organization	Relation to CSG	Commencement
<i>Federal Policy/Regulations/Or ganization</i>			
Environmental Protection & Biodiversity Conservation Act 1999	The <i>Environment Protection and Biodiversity Conservation Act 1999</i> (the EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places which are defined in the EPBC Act as matters of national environmental significance.	The main piece of Federal Environmental legislation that regulates CSG mining if projects take place on nationally sensitive land.	Amended and Commenced: December 2008

The Chief Scientist of Australia	Professor Ian Chubb AC was appointed to the position of Chief Scientist on Tuesday 19 April 2011 and commenced the role on Monday 23 May 2011. The Chief Scientist for Australia provides high-level independent advice to the Prime Minister and other Ministers on matters relating to science, technology and innovation. They also hold the position of Executive Officer of the Prime Minister's Science, Engineering and Innovation Council to identify challenges and opportunities for Australia that can be addressed, in part, through science.	All matters relating to national CSG mining operations that could potentially harm nationally important land are reported to the Chief Scientist, who then reports and advises the Federal Ministers.	
State Policy/Regulations/Or ganization			
Environmental Planning & Assessment Act 1979	The Environmental Planning & Assessment Act (The EP&A Act) is a three tier system of State and Local significance, and requires the <i>relevant planning authority</i> to take into consideration the impacts to the environment (both natural and built) and the community of proposed development or land-use change. Most development requires a <i>Statement of Environmental Effects</i> detailing the impacts to both natural and human environments, which should be taken into consideration by the regulatory authority while larger projects require a more thorough <i>Environmental Impact Assessment</i> and greater public scrutiny.	Used to regulate the impacts of CSG both the natural and built environment. Mining companies must submit reports under this legislation detailing the overall impact the CSG initiative will have on the surrounding area as well as viable mitigation measures.	Amended and Commenced: May 2014
Petroleum (Onshore) Act 1991	The Petroleum (Onshore) Act 1991 covers onshore exploration and production of petroleum (ie oil and gas). It	The chief licensing piece of legislation in relation to all fossil fuel extraction and	Amended and Commenced:

	creates exploration and production titles and also addresses environmental protection, royalties and compensation. The regulation requires all exploration or other activity carried out under the authority of a petroleum title to be carried out in conformity with the schedule published by the Department	development. Companies must meet the regulations and guidelines set out in this Act before a permit to mine CSG can be given.	December 2013
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Water Management Act 2000	<p>The object of the Water Management Act 2000 is the sustainable and integrated management of the state's water for the benefit of both present and future generations.</p> <p>It recognises the need to allocate and provide water to ensure the environmental health of our rivers and groundwater systems, while also providing licence holders with more secure access to water and greater opportunities to trade water through the separation of water licences from land.</p>	Regulates CSG operations relating to water, which includes water contamination, brackish water treatment and protection of vital water sources in NSW.	<p>Amended and Commenced: November 2013</p> <p>To be re-amended in early 2015</p>
Protection of the Environment Operations Act 1997	<p>The Protection of the Environment Operations Act 1997 is an important piece of planning and environmental legislation that was brought into effect by the Office of Environment and Heritage (OEH). This single piece of legislation repealed the following legislature (Dep. Environment and Heritage, 2011):</p> <ul style="list-style-type: none"> • Clean Air Act 1961 • Pollution Control Act 1970. • Clean Waters Act 1970 • Noise Control Act 1975 • Environmental Offences and Penalties Act 1989 <p>The legislation has since been amended in 2005 and has been drafted for amendment again in 2011 to incorporate number factors, such as a shift in regulatory bodies and a increase in penalties as well as a tightening on things that were considered loopholes in the previous legislature (Dep. Environment and Heritage, 2011).</p>	Regulates all Pollutants that can result from CSG mining. It lays out the fines and penalties for breaching the mining license and is the primary piece of legislation used by the EPA as a prosecution tool.	Amended and Commenced: January 2013

Office of Coal Seam Gas	Created in February 2013 the OCSG will act as the secondary regulator of CSG activity in NSW. Its primary role is to ensure compliance with permits, WH & S and reporting major environmental threats to the EPA. The Office also acts as an advisor to the Premier and the State Cabinet.	<p>The OCSG is responsible for:</p> <ol style="list-style-type: none"> 1. Administering CSG titles and activity approvals granted under the Petroleum (Onshore) Act 1991 and associated assessments under the Environmental Planning and Assessment Act 1979; 2. Monitoring and auditing title compliance, including in relation to rehabilitation and security deposits; 3. The application of workplace health and safety requirements under the Petroleum (Onshore) Act 1991 and the Work Health and Safety Act 2011 (WHS) to petroleum operations 4. General enforcement and compliance of CSG operations within these acts. 	Commenced: February 2013
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Strategic Land Use Policy	<p>Sets out a range of initiatives to balance the growth of the mining industry and the protection of water sources and agricultural land.</p> <ul style="list-style-type: none"> • The reform now covers the Upper Hunter Valley • Strengthening of regulations for exploration • Establishes the role of the land and water commissioner • Establishes a state wide Aquifer Interference Policy • 2 codes of practice for CSG mining • Agricultural impacts will be assessed at the exploration stage • Agricultural land mapped for protection now over 2 million hectares • Implementation of a Gateway Panel 	<p>Primary piece of policy that sets out the protections and regulations for CSG mining. Maps the states most vulnerable agricultural land and protects for CSG mining operations. Has ensured that the previous “exceptional circumstances,” which allowed mining activity to assume preference over agricultural operations as a State Significant process, has been repealed.</p>	Commenced: September 2012
Aquifer Interference Policy	<p>The purpose of this policy is to inform the minister of their role and requirements in administering the <i>Water Management Act 2000</i>. The policy will form the platform for the assessment and advice provided by the minister at various stages of an assessment under <i>the Environmental Planning and Assessment Act 1979</i>.</p> <p>This policy sets out the important sections of each legislative piece that corresponds with the use of water in mining or activities that may affect water sources. It explains the licensing and water extraction guidelines from various water sources such as aquifers, rivers and lakes. As well as the appropriate means to dispose of waste water.</p>	<p>Coal Seam Gas mining under this policy has been classified as a high risk activity. This policy sets out the guidelines for the minister to advise on the exploration and extraction of coal seam gas as well as the disposal of waste water. Informs the minister on the processes of hydraulic fracturing and allows for the assessment as to whether it will impact any water sources and is in compliance with the “Code of practice for Coal Seam Gas Fracture Stimulation.”</p> <p>Furthermore it reinforces the ban on the use of evaporation ponds for waste water produced during CSG activities.</p>	Commenced: September 2012

Mining and Petroleum Gateway Panel	<p>Independent body established in October 2013 under the Mining SEPP. It is one the key elements of the <i>Strategic Regional Land Use Policy</i>. The principle role of the panel is to assess the agricultural impacts of State significant mining and CSG on Strategic Agricultural Land before a development application is lodged.</p> <p>Following assessment 2 types of certificates can be awarded – a certificate confirming the proposal meets the specific criteria and conditions or a conditional certificate that may include recommendations such as further studies or project modifications.</p>	<p>Convened under the reformed Strategic Regional Land Use Policy the Gateway Panel is responsible for the assessment and initial certification of all CSG mining proposals. Water security and threats to agricultural land will be assessed by the independent panel.</p> <p>The Gateway Panel must issue a confirmation certificate for any proposal to proceed to the development application stage under the <i>Environmental Planning and Assessment Act 1979</i></p>	Commenced: October 2013
Code of Practice for Coal Seam Gas – Well Integrity	<p>Provides a guide for CSG title holders on how to ensure that they comply with the condition of their license on exploration, extraction or production under the <i>Petroleum (Onshore) Act 1991</i>. This is to guarantee that well operations are carried out safely and without any risk to health and any detriment to the environment.</p> <p>This code sets out activities, technical requirements, actions, responsibilities and responses to events.</p>	Code of practice that ensures safe well procedures during CSG exploration and mining. Sets out the procedure for the assessment of the impact to the environment, water sources and disposal of waste products.	Commenced: August 2012
Code of Practice for Coal Seam Gas – Fracture Stimulation	<p>Code created to ensure that fracture stimulation activities are conducted in a safe manner that don't pose threat to local communities, water resources and the environment.</p> <p>Is to be used in conjunction with the Code of Practice for CSG – Well Integrity.</p>	This regulates and promotes safety in CSG production. The codes must be adhered to under the Petroleum (Onshore) Act 1991, as the primary activity to extract CSG from coal seams this code plays an important part in the operation and extraction of CSG.	Commenced: September 2012