

# **Excavating the Post-Political: Mining, Water and Public Participation in Arizona, USA**

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THESIS

**Owen Michael King**

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# Abstract

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Contributing to recent debates in democratic theory and human geography around the ‘post-political’ nature of contemporary modes of governance, this thesis challenges the extent to which deliberative, participatory spaces of impact assessment lend democratic agency to those impacted by resource development projects. It examines the contention that the knowledge produced in these spaces is biased toward the interests of corporate power and capital accumulation. The research connects three ‘registers’ of theoretically-informed enquiry: the aforementioned *macro*-level theorisations of what constitutes democracy and ‘the political’; the *meso*-level questions around the implementation of participatory practice within NEPA; and *micro*-level empirical situations where the above have recently come into play.

Empirically, the research takes one case study of a proposed copper mine in southern Arizona, United States. Specifically, it focuses on the Environmental Impact Assessment (EIA) process mandated by the United States’ 1969 *National Environmental Policy Act* (NEPA). Central to this example are the links between two types of resource, hard rock minerals and water – the large-scale realisation of which has been fundamental to development in this semi-arid region – and the ‘hydrosocial’ ecologies and economies in which they are entwined.

Employing a mixture of extensive and intensive methods within a broad critical realist framework, the research centres on the content of public comments in response to the Draft Environmental Impact Statement for the proposed mine and a series of in-depth interviews with key informants. At the *meso*-level, it analyses the nature of competing discourses articulated in the NEPA EIS public commenting process, and the extent to which the institutional response to participatory process corresponds to normative conceptions of substantive democratic participation. At the *micro*-level, it aims to understand the role that spatial relations of social, political and economic power play in the trajectory of the process. Finally, the thesis considers how the case in question speaks back to *macro*-level theoretical debates around post-politics and post-democracy.

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# Acronyms and abbreviations

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## Documents

EIS	Environmental Impact Statement
Forest Plan	“Coronado National Forest Land and Resource Management Plan,” as amended (U.S. Forest Service 1986)
MPO	Mine Plan of Operations
ROD	Record of Decision

## Organisations & other acronyms

AAC	Arizona Administrative Code
ACC	Arizona Corporation Commission
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AGS	Arizona Geological Survey
ASARCO	ASARCO LLC
ASLD	Arizona State Land Department
Augusta	Augusta Resource Corporation
BLM	Bureau of Land Management
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNF	Coronado National Forest (i.e. the agency department of the USFS)
CWA	Clean Water Act
EA	Environmental Analysis
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement

EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
USFS	United States Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
FAC	Federal Advisory Committee
ID team	Interdisciplinary Team
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
PCS	Public Concern Statement (issued in response to public comments)
Rosemont	Rosemont mining district
Rosemont Copper	Rosemont Copper Company
SIA	Social Impact Assessment
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WUS	waters of the United States

**Note regarding legal references**

United States laws and regulations are not included in the bibliography but cited in the text in the standard American Psychological Association (APA) style.

This format comprises: the title number; whether it is a U.S.C. (United States Code) statute or C.F.R. (Code of Federal Regulations) regulation<sup>1</sup>; and the section number. For example: (16 U.S.C. § 1531).

All laws and regulations are searchable on the Cornell University Law School website at <https://www.law.cornell.edu/cfr/text> [accessed 26 April 2016].

**Note regarding references to data sources**

Data sources (for example, Environmental Impact Statements issued by the U.S. Forest Service) are cited in footnotes which refer the reader to the Appendix or an on-line source, and are not included in the bibliography.

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<sup>1</sup> When U.S. Congress passes a law, that law is recorded in a set of books known as The United States Code (or U.S.C.). New U.S.C. laws cannot be enforced until new regulations are issued. Those regulations implement the USC laws, and are recorded in the set of books known as: the Code of Federal Regulations (or C.F.R.)

## Prologue: The Patagonia Riot

20th March 2008, Patagonia High School, Santa Cruz County, Arizona, United States<sup>2</sup>.

A booming voice silences the cacophony in the large, fluorescent-lit hall, where almost two-hundred people, animated and earnest, are gathered around tables and easels. “Would everybody in here please come forward, we’re going to have a vote with a show of hands.” The convenors, federal staff with the United States Forest Service, are holding their third ‘open house’ ‘public scoping’ meeting on the ‘Rosemont Copper Project’, a mining operation proposed within their jurisdiction of the Coronado National Forest<sup>3</sup>. The project plans to take a chunk out of an eastern flank of the northern Santa Rita Mountains, 35 kilometres to the north of Patagonia in south-east Arizona, and has attracted considerable local attention.

The town of Patagonia is nestled in an upland region of Santa Cruz County, to the south-east of the city of Tucson. Perched above the Sonoran Desert, the surrounding country is all sweeping grasslands, studded with dwarf oaks, and criss-crossed by dusty, dirt roads. Shallow red canyons cut down through rolling foothills of the Santa Ritas, which rise to the west up to 2,800 metres. The gulches and creeks are largely parched of water, but occasional perennial oases are guarded by unkempt ranks of tall green cottonwoods. Between is a patchwork of public land, ranches, and smaller residential plots. Patagonia, like many old mining towns in the region, now sustains itself through a mixture of arts and tourism. It’s a colourful and surprisingly lively place.

In the town high school’s assembly hall, a vote is not on the agency’s agenda. But their guests have decided otherwise. “Would everyone who would like to have a *real* meeting...”, the speaker continues. The attendees, stood around the instigator in the middle of the hall, cheer loudly and raise their hands in the affirmative. In the background, a stern-looking Forest Service Ranger in khaki uniform, a pistol holstered on his hip, turns away to talk into his radio.

The Forest Service staff observe silently from the edges, beside their ‘discussion stations’ with display boards, captioned pictures, maps and diagrams, flyers and comment forms for the attendees to fill in. Those present look similar to many I met during my time in Arizona, and there are some faces I recognise. There are residents of the Cienega Valley, directly downstream of the proposed mine site, and from the neighbouring communities of Sonoita, Elgin and Tucson. Cargo pants, check shirts, waistcoats, Stetsons or baseball caps, curly-haired women and goatee-bearded men, most greying at least around the edges. Some of

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<sup>2</sup> Drawn from first-person accounts, media reports (Miller 2008), and video footage (Anon 2008) of events at the third open house meeting on the Rosemont Copper Project Environmental Impact Assessment conducted by the United States Forest Service (Coronado National Forest) at Patagonia High School, Patagonia, Arizona on 20<sup>th</sup> March 2008.

<sup>3</sup> The Coronado National Forest includes an area of about 7,200 square kilometres, spread throughout mountain ranges in south-eastern Arizona and south-western New Mexico.

them carry placards with an image of the mountains accompanied by the words 'Stop the Rosemont Mine', or 'Save the Scenic Santa Ritas'.

"Well, I would say that the *eyes* have it", says the ringleader, his bearded jaw tucked tensely into his flushed neck. "Now whoever is here from the Forest Service or Rosemont, I hope that you are taking this into account, and that you will hold a *real* meeting with public input, with proper notice. Otherwise, ah...I don't know, this is, this is just 'chart-looking!'"

Geoff Bird – a Cienega Valley resident who, seven years later, in a lay-by overlooking the proposed Rosemont mine site, would recount the event to me – is the next to speak up. "Yeah, I didn't come here for a first-grade meeting to look at charts!" His pleas are met with more cheers. His right arm is in the air, his pointed finger jabbing over the shoulders of those in front of him, insisting. "I came here to [voice] my opinions on what's goin' on here, and I want some people up there on the stage so I can ask them questions!"

In the background, with a nod from the Forest Supervisor, the CNF staff commence a withdrawal, packing up their displays into cardboard boxes and disappearing through the exits, speaking only among themselves.

With the ID team gone, those remaining arrange chairs in rows to face the stage, and proceed to conduct their 'real meeting' among themselves. A new speaker steps up to address the group, but moments later the armed Forest Service ranger invites him in no uncertain terms to leave the stage. No longer 'official', the gathering is broken up.

Outside, the attendees spill out into the school car park in the evening light. As CNF officials climb in to their white pick-ups, three departments of local law enforcement arrive on the scene. All are carrying weapons, which is not unusual, but some are also wearing body armour. They include the Santa Cruz County Sheriff's Department, a K-9 unit from Tucson, and officers from the United States Border Patrol on quad bikes. They are accompanied for good measure by the Patagonia Fire Department. The departing participants, largely retirees, are incredulous. "Better go save those Forest Service employees!" jokes one onlooker.

In the aftermath, the presiding Forest Supervisor for the CNF, Jeanine Derby, claimed "[i]t was very orderly, but then some people wanted to run it their way, so we closed the meeting." Another CNF representative stated, "people who don't understand the process will not be able to make an informed comment."

Seven years after the event, the Rosemont Copper Project had yet to be approved. Henry Bird and his wife, Mary, had since dedicated much of their time to campaigning with the 'Save the Scenic Santa Ritas' group to stop the Rosemont Copper Project. We lean against a barrier beside Highway 83 and look across the grassy foothills to the mountains rising behind the proposed mine site. For

Henry, it all started that day in the school hall. He is just as animated, still incredulous. “They called it the *Patagonia Riot*”, he tells me, not quite laughing.



Plate 0.1 – USFS Rangers close down the open house meeting at Patagonia High School. Image reproduced with the permission of Nogales International.



# **1. Introduction: mining, water and impact assessment in the United States**

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This thesis is about contested spaces of environmental governance, in which projects of economic development are assessed and adjudicated. More specifically, it is concerned with the extent to which such spaces can be claimed to have been democratised. It thus takes as its starting point the democratic principle that citizens have a right to participate in such processes that may have an impact upon them, and that subsequent outcomes are legitimate only insofar as they reflect the consent of those subject to them. It therefore engages with the widely accepted notion that democratic governance should be 'deliberative', in that it must provide open, consensual spaces within which members of the public are able to freely speak and be heard on issues of concern (Offe 2011). However, contributing to recent debates in democratic theory, this thesis challenges the extent to which the institutionalisation of this dominant deliberative paradigm lends democratic agency to those who participate. To do so, I take a unique empirical example of perhaps the most widely-used approach to environmental governance, environmental impact assessment (EIA).<sup>4</sup> More specifically, the research focuses on one case study of public involvement in the EIA process, mandated by the United States' 1969 *National Environmental Policy Act* (NEPA), one relating to a proposed copper mine in the State of Arizona in the southwestern United States. The overall aim is to investigate the limits to – and resultant 'overflows' from – what I will refer to as the 'democratic capacity' of this participatory process, and the implications for practice, policy and theory.

The research conducted centres on the links between two types of resource, the large-scale realisation of which have been fundamental to development of modern society, hard rock minerals and water. These two elements respectively constitute the substrate and synthetic basis upon which ecologies and human environments depend. However, the water cycle, and thus the spatial and temporal availability of water resources, is increasingly subject to climatic change, such that assertions of an imminent global water crisis have become commonplace. Yet in our globalised world, these 'local' resources are increasingly appropriated, embodied and reconstituted as commodities and products – such as electronics – which have become indispensable to modern lives far from their points of extraction. This creates a significant problem for government, in that global political-economic imperatives must be balanced against local, regional and national democratic legitimacy. Thus, the local ecological, cultural and economic impacts of activities such as mining become key objects of contestation in environmental decision-making.

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<sup>4</sup> The use of the term EIA here is intended to include both environmental *and* social impact assessment (SIA), the latter of which is often not explicitly referred to in the literature but can generally be said to be integral to the EIA process.

This chapter first introduces mining and water resources as the key themes in relation to environmental impact examined in this thesis, and highlights the significance of the relationship between the two. The research is situated in respect to political ecological perspectives on water and mineral resource exploitation. Section 1.2 introduces NEPA and EIA as a response to the environmental and democratic concerns which gained prominence in the 1970s and outlines the principles which guide the Environmental Impact Statement (EIS) process. In Section 1.3, the participatory requirements of NEPA are outlined. The aims of this thesis are then orientated in respect to the growing body of research on the post-political or post-democratic nature of such forms of democratic governance, and the politics of knowledge inherent in such approaches. After framing the research in terms of a contribution to *micro*, *meso* and *macro*-registers of scientific enquiry, I introduce the research questions which directed the empirical investigations. Section 1.4 then outlines of the structure of the thesis, which briefly summarises the chapters to follow, before a brief conclusion.

### 1.1. Water and mining

As one of the primary means by which humans acquire the raw materials for the manufacture of products, technologies, construction materials, and the generation of energy, mining remains as much an abiding interest to governments and corporations as it does to scholarly research. Despite considerable volatility over the past decade, in 2015 the value (total market capitalization) of the top forty global mining companies remained at US\$494 billion (PWC 2015). However, mining also has significant environmental impacts, and mining projects have been the focus of much conflict, with environmentalists and communities often pitted against corporations and states.

One of the major objects of this conflict has been the impact of mining upon water resources, and the subsequent environmental and social effects of major projects (Earthworks 2013, Warhurst 1999). From exploration through to closure, water plays a vital role in a mine's lifecycle (Collins and Woodley 2013). The processing of metal ores such as copper is impossible without significant quantities of water (Gunson *et al.* 2012, Woodley *et al.* 2013). As well as being used to process ore and separate minerals, water is also essential for a number of ancillary processes, including: transporting and processing ore; treating and transporting waste tailings; cooling, lubricating and washing equipment; and suppressing dust. During 2010, more than 7.35 million cubic metres of water were estimated to have been withdrawn for use in mining in the United States, making up 1% of total withdrawals and about 3% of total withdrawals for all categories excluding thermoelectric power. Groundwater was the source for 73% of total withdrawals for mining. Despite economic fluctuations, total mining withdrawals in 2010 were 39% more than in 2005. Using just over 2 million

cubic metres, the States of Nevada and Texas accounted for 41% of fresh groundwater withdrawals in 2010. Arizona alone withdrew 328,000 cubic metres during the same period (Maupin *et al.* 2014). In environments where water resources are becoming increasingly stressed, processes of extraction amplify such pressures significantly.

Mineralisations are often found in headwater areas that serve as sources for rural and urban water networks which have been put in place over the past century. They also frequently occur in desert areas where water required for extraction and processing has to be diverted from elsewhere and other uses (Bebbington *et al.* 2008). Many mining projects are also located in areas valued for their ecological integrity. Not only do open pit mines and their associated infrastructures have direct, extensive and destructive impacts on nature within the 'footprint' of the operation, they also have significant 'downstream' implications. The excavation of an open mine pit creates a hydraulic sink, causing drawdown of the surrounding water table. Water is essential for the reproduction of biological processes from which materialise innumerable habitats and landscapes. Thus, as well as impacting upon water supply for humans, this dewatering may affect plants and animals whose habitats are sensitive to water availability (McCullough *et al.* 2013). Furthermore, these landscapes and ecologies are themselves valued for their various attributes by different societal groups. For example, springs, streams, waterfalls, lakes and riparian habitats are often of traditional or spiritual significance for local and/or indigenous people (Johnston *et al.* 2011). Meanwhile, ground and surface water conditions are critical to the existence of localised topographies valued by many for recreation, exercise, and hunting.

Water, therefore, is at once an economic good embodied within the global flows of capital; a material good, which constitutes the products and services that have become essential to modern life; *the* essential element for both human life and socio-natural ecologies; and is embodied within cultural practices, which are significant for health and wellbeing (Staddon 2010). Few bodies of water, if any, on earth have escaped human interference. Thus, what have emerged through time are complex 'hydrosocial' landscapes, to which essential interests of an economic, social and cultural nature are attached (Linton and Budds 2014, Sultana 2013, Swyngedouw 2009). This complexity is the product of specific historical, geographical and socio-political contexts, with multiple competing interests, which the enactors of environmental decision-making processes are tasked with mediating. This thesis adopts a political ecological perspective, insofar as it views mining as one of many human endeavours which is enabled by water resources; and understanding the subsequent changes to ecological, social and economic relations as – to a significant degree – mediated through changes to flows and qualities of water.

At the same time, these water resources are heavily implicated in a growing global crisis that been propelled onto scientific and political agendas, and into the popular conscience – climate change. Since its emergence in the 1990s as a supranational concern led by the United Nations Environment Programme and the Intergovernmental Panel on Climate Change (IPCC), the precise nature of climate change (for example, the respective roles of the Atlantic thermohaline circulation, El Nino, polar ice mass balance changes, etc.) has been the subject of vociferous debate. However, it is increasingly accepted that that we are living in an era of global warming. With global mean temperatures (sea and air) increasing more quickly than at any time in the documented past, the impact of climate change and extreme weather patterns upon human wellbeing has become increasingly apparent during the past half-century (IPCC 2013, NOAA 2017, Trenberth *et al.* 2015).

Central to the implications of warmer global temperatures for humans are its impacts upon precipitation and water availability. Shifting weather patterns are further affecting the amount of water accessible for human use, and the way it moves through complex socio-technical-ecological systems. Increased variability and prevalence of extreme weather events are compromising efforts to regulate, capture, divert and utilise flows of water using historically acquired knowledges and techniques. Globally, as many as 780 million people do not have access to clean drinking water, at least 2.5 billion people are affected by inadequate access to safe sanitation systems, and as many as 5 million people—mainly children—die as a result of preventable water-related illnesses every year (Gleick 2000, United Nations 2009, World Health Organization and UNICEF 2012).

Water is thus one of the most critical sustainability issues facing the mining industry (Bebbington 2012b), and water resources are a significant consideration in the planning mining projects and in the assessment of their environmental and social impacts.

## 1.2. Environmental Impact Assessment and NEPA

EIA can perhaps most succinctly be described as a systematic process of assessing the environmental consequences of development actions. Its intended purpose is as an aid to decision-making and, increasingly, an instrument for ‘sustainable development’ (Glasson *et al.* 2005). The United States’ *National Environmental Policy Act* of 1969 (NEPA) represented the first formal incorporation of the concepts of EIA into domestic law (O’Riordan and Sewell 1981). It was signed into law by President Richard Nixon on 1<sup>st</sup> January 1970, declaring:

a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health

and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation.<sup>5</sup>

NEPA emerged at a time when Congress was receiving testimony from many quarters of society warning of environmental degradation and even disaster (Ashby 1976, Sullivan 2014). Its enactment was politically catalysed by a number of significant environmental accidents in the US, prominent among which were the Santa Barbara oil spill in January 1969 (NOAA 1992) and the Cuyahoga River fire in Cleveland the following June (Adler 2002). Popularised in part through a number of environmentalist publications, most notably Rachel Carson's *Silent Spring* (1962), a burgeoning environmental movement took up these events as symbols of the disastrous consequences of unregulated industrial development. Indeed, the weight of popular opinion compelled congressional representatives to compete for the political leadership of this new movement. Over the course of 1969, more than 2,000 legislative proposals relating to environmental issues were introduced to the two houses of Congress. The NEPA bill was introduced to the Senate by Henry Jackson in February 1969 (Spensley 2014), and was strongly advocated by Arizona Representative Morris Udall and his elder brother Stewart. Udall senior had used much of his time as Interior Secretary under presidents Kennedy and Johnson pushing for increased environmental protections, especially for Federal lands.<sup>6</sup>

In the words of its own administrative council (the President's Council on Environmental Quality, the CEQ), NEPA is the "Magna Carta" of the United States' environmental movement<sup>7</sup> (CEQ 2007a). The Act's policies are broad and general, and its goals are ambitious (Spensley 2014). The Act emphasises the need to recognise the "profound impact of man's [sic] activity on [...] the natural environment" and that "each person should enjoy a healthy environment." It seeks to balance the consideration of environmental factors with economic factors in decision-making by promoting the use of "all practicable means and measures [...] to fulfil the social, economic and other requirements of present and future generations of Americans" (CEQ 2007a).<sup>8</sup> It goes on to identify six specific goals as a guide to the federal government to implement the policy:

1. Fulfil the responsibilities of each generation as trustee of the environment for succeeding generations;

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<sup>5</sup> 42 USC § 4321

<sup>6</sup> The brothers would go on to establish the Udall Center for Studies in Public Policy at the University of Arizona in Tucson. The center specialises in issues relating to environmental policy, with a strong emphasis on water-related research.

<sup>7</sup> This alignment with the environmental 'movement' is something which has, at least to some extent, become manifest in the position of caution the EPA typically adopts in relation to development on federal land.

<sup>8</sup> 42 USC § 4331

2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;
5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

NEPA requires that responsible federal agencies must consider the environmental impacts of all actions on publicly owned, federal lands that may “significantly” affect the quality of the human environment (Spensley 2014). As well as federally funded or executed projects, such actions include those proposed by non-federal entities such as companies. The EIA processes instituted under NEPA are aimed at the production of an Environmental Impact Statement (EIS). The process through which this document is produced is used to inform the final decision on whether or not to approve a proposed action that has been determined to have potentially significant impacts.

Since its enactment, many other countries have transposed the principles of NEPA into their own formal procedures or legislation relating to planning or other areas of environmental governance. Forty-five years after NEPA was passed in the United States, EIA is now globally recognized as a principal tool of environmental management, firmly embedded in domestic and international environmental law (Esteves *et al.* 2012, Morgan 2012, Ortolano and Shepherd 1995, Pope *et al.* 2013). As discussed in Chapter 3, the case study of EIA chosen as the empirical object for this thesis represents an opportunity for a uniquely situated contribution to a body of research on a globally adopted mode of governance. As discussed in Chapter 2, engagements between EIA and critical democratic theory are also at a relatively nascent stage of development.

### 1.3. NEPA and public participation: aims and objectives

The NEPA regulations state that the information used in the EIS process must be of a high quality, incorporating “[a]ccurate scientific analysis, expert agency comments, and public scrutiny.”<sup>16</sup> Thus, in addition to the ‘lead’ agency (with primary responsibility for the management of the public land in question), other government agencies – at state, federal and local levels – which may have parallel

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<sup>16</sup> 40 CFR 1500.1

permitting decisions or special expertise in respect to the proposal are invited to contribute to the impact assessment as ‘cooperating agencies’.<sup>17</sup> However, beyond requiring “full disclosure” to the public (of any recommendations, reports or statements concerning proposals for actions which significantly affect the quality of the human environment), the original language of NEPA did not specifically address public involvement when it was enacted in 1969. One year later, President Nixon’s executive Order 11514 explicitly expanded NEPA’s text in this regard, directing all agencies to “ensure the fullest practicable provision of timely public information and understanding [...] in order to obtain the views of all interested parties” (Phillips and Randolph 2000). It was not until 1978, when the Council on Environmental Quality (CEQ) first issued regulations to implement NEPA, that the requirement for federal agencies to “[e]ncourage and facilitate public involvement in decisions which affect the quality of the human environment” was made explicit in the policy. And it took a further decade, following the impetus given to participation in sustainable development discourse in the early 1990s, for the CEQ to publish any form of guidance for participation and collaboration in NEPA (see: CEQ 2007a).

Notwithstanding these later developments, in their conception, neither EIA nor NEPA were democratic projects. Indeed, as an approach to mitigating the environmental problems associated with capital projects, EIA arose largely out of a technocratic, modernist philosophy (Lawrence 2000). It thus placed an emphasis on the physical environmental consequences of economic developments, employing engineers and scientific experts to model and predict the material impacts of proposed actions. This heavy emphasis on examining the impacts of proposals on the natural environment corresponded to an equal neglect of social impacts. These experts have often seen the EIA process as a ‘planning tool’, part of a ‘rational’ planning model in which objects, objectives and criteria for analysis are identified in advance. This rational view sees such processes as being devoted to objectively investigating the relative effects of alternative courses of action and selecting that which has the greatest net benefits for society (Ortolano and Shepherd 1995).

Indeed, it remains that EIA is not a ‘decision-making process’ upon which the public has a right of direct influence. To paraphrase the NEPA guidelines, its public involvement provisions do not constitute a ‘voting’ process for the approval or rejection of alternative courses of action.<sup>18</sup> Rather, it is a scientific assessment of impact that, in order to retain political legitimacy in light of recent deliberative trends, has been retro-fitted to require the encouragement and facilitation of public

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<sup>17</sup> Permitting decisions under parallel environmental regulations, for example the Endangered Species Act, which is administered by the United States Fish and Wildlife Service (FWS).

<sup>18</sup> See Appendix 22.2



participation at various stages of the analysis. The lead agency conducting the NEPA process retains decision-making authority, which informed by the scientific analyses that constitute the EIA process. Nevertheless, the regulatory guidance for NEPA does provide a framework for public participation in the production of the EIS, in the form of a spectrum of approaches from *informing* to *consulting*, *involving* and *collaborating* with interested parties (ibid). While this guidance is ambiguous in terms of what groups are involved, how, and to what extent; the research conducted for this thesis shows how the interpretation and enactment of this guidance is as much a product of the relationship between power and knowledge as it is of normative democratic ideals. As the Rosemont case exemplifies, this has consequences for the scientific and political legitimacy of the process and, consequently, its trajectory.

Despite their genesis, this thesis thus interrogates how public participation in EIA and NEPA plays out on its own terms in a contemporary context. That is, notwithstanding its origins, I argue that the popular legitimacy of the decisions arising from this form of environmental governance rest upon its adherence to a neoliberal discourse of public engagement and participation. Moreover, it has been argued that – whereas the analysis of the merits of major federal projects in the United States was previously conducted almost entirely behind the closed doors of federal and state government agencies – NEPA does represent a significant ‘opening out’ of these processes into the public sphere (Brooks and Harris 2008, Cramton 1971, Dietz and Stern 2008, Ortolano and Shepherd 1995). In particular, the idea of involving the public in early scoping of a problem is often viewed as one of NEPA’s most important contributions to public participation. This provision has been interpreted by some as a significant step toward normative democratic ideals in which citizens are not only are to influence decisions, but are also instrumental in the definition of issues to be addressed (Dietz and Stern 2008).

### 1.3.1. Aims and objectives

As the title to this thesis suggests, its aim is to interrogate what a number of political theorists have described as the ‘post-political’ nature of governance and public participation. Implicit in the term is a perspective that views the administration of the affairs of the state as having been depoliticised (Wilson and Swyngedouw 2014). As discussed at length in Chapter 2, ‘the political’ is seen as having been displaced by a consensual mode of governance stemming from theories of ‘deliberative democracy’ and ‘communicative action’, in which multiple ‘stakeholders’ are freely engaged in arrangements of public participation (Swyngedouw 2011). It has been contended that this approach is representative of a ‘post-democratic’ anti-democratic era, in which oppositional critique that falls outside of the scientific discourse of the dominant political-economic configuration is foreclosed

upon (Rancière 2004, Žižek 1999). This, some have argued, represents a disavowal of the irreducible antagonistic dimension of social relations, in which collective ‘we’ identities are always defined in relation to a ‘they’ (Mouffe 2005). Thus, despite espousing democratic principles of participatory consensus-building as central to decision-making, these theories contend that such policies and practices remain fundamentally exclusionary, biased toward political-economic interests, and are constitutive of a democratic deficit.

This thesis thus offers an empirical perspective on the democratic capacity of public participation in environmental governance by excavating the ground of this putatively post-political terrain in one case of the NEPA EIS process. This process of impact assessment was the primary empirical object of this research, as opposed to the ‘decision-making’ process that occurs subsequently. Based upon an interrogation of the relationships between power, knowledge and discourse, the following questions (RQ1 to RQ4) were aimed at connecting three ‘registers’ of theoretically-informed enquiry: *macro*-level theorisations of what constitutes the democratic and the political referred to above; *meso*-level questions around the implementation of participatory practice within NEPA; and *micro*-level empirical situations where the above have recently come into play. Critically, the research draws on perspectives from Science and Technology Studies to highlight the scientific and ethical controversies – or “hot situations” (Callon 1998) – that cannot be contained by this process of impact assessment, their implications for the trajectory of the case example used, and for the future practice, policy and theory.

- RQ1        *What is the thematic and geographical nature of competing arguments in the NEPA EIS public commenting process for the proposed Rosemont Copper Project?*
  
- RQ2        *What are the limitations to the agency of this public engagement and those participating in the NEPA EIS process?*
  
- RQ3        *What role do spatial relations of social, political and economic power play in the NEPA EIS process?*
  
- RQ4        *How can the Rosemont case be considered within the wider context of theoretical debates around the democratisation of environmental decision-making?*

#### 1.4. Thesis structure

Chapter 2 situates the above aims and questions in relation to relevant existing theoretical and empirical literatures, beginning with critical accounts of public participation in EIA and NEPA specifically. The chapter outlines the deliberative theoretical underpinnings of this participatory

manners practice, which first became influential in the discipline of planning in the late 20<sup>th</sup> century. The recent post-political critiques of this dominant consensual framing for the democratisation of governance, to which this thesis contributes, are introduced. The influence of the post-structuralist turn in this theoretical development, and its exponents' perspective on power, knowledge and the disciplinary effect of discourse, is related to contributions from the field of political ecology. A review of the latter literature, particularly in respect to water and mining, is then presented. It is argued that relatively little empirical attention has been paid to the substantive efficacy of participatory arrangements 'in-practice'. Moreover, the absence of a post-political theoretical perspective on public engagement in the NEPA EIS process is identified as a significant gap in the literature. Similarly, it is argued that few political ecologies of water and/or mining have been grounded in post-political theories of democracy. The chapter closes with a description of the historical and geographical context for the chosen case study for this research, specifically in relation to water and mining in the south-western United States and Arizona.

Chapter 3 outlines a unique methodological contribution to the analysis of the processes of EIA and public participation. The chapter first introduces the proposed Rosemont Copper Project, the rationale for the use of a case study, and its selection as the empirical focus for this research. It then provides an overview of the history and context of the Rosemont case, including a chronology of the NEPA EIS process. It argues that a broad critical realist epistemological approach, which connects [*macro*-level] structures, [*meso*-level] mechanisms and [*micro*-level] events, is appropriate to the aims of this thesis. The chapter thus describes a two-phase data collection and analysis, using extensive and intensive methods. The extensive phase entailed a Thematic-Spatial Analysis of the efficacy of the NEPA EIS process in incorporating public views into decision-making process (RQ1 and RQ2). The analysis centred on the written public comments submitted by 397 citizens in response to the Forest Service's Draft EIS. This was followed by a thematic analysis of the mandatory institutional responses to the public comments, and the extent of the subsequent changes to the Final EIS analyses. The intensive phase, meanwhile, included in-depth interviews with 27 key informants, participant observation, and archival research. These qualitative methods were used to explore the relative effects of structural relations of power and relative autonomous agency in the democratic process (RQ3). The chapter concludes by reporting on the ethical considerations prior to entering the field and reflecting on the methodological challenges faced during data collection.

Chapter 4 begins by describing data set in respect to the respondents whose comment submissions were thematically analysed, and the relationship between expressions of support or opposition and geographic scales of proximity to the proposed mine site. Responding to RQ1, the results of the

Thematic-Spatial Analysis are thus presented. The themes identified from the written comments and the analysis of their prevalence among the respondents in respect to the six geographic scales form the basis for the evaluation of their agency in the EIS process in Chapter 5. The results confirm the highly contested nature of the Rosemont matter, with themes emerging from the public comments pertaining to two primary domains: the *socioecological* and the *socioeconomic*. Concerns relating to water and water resources are equally prominent, with issues around water quantity and quality cutting across the aforementioned themes. Arguments from both sides strongly reflected concerted efforts and counter-efforts to frame public discourse on the part of various groups.

In response to RQ2, Chapter 5 presents an analysis of the institutional responses to the public commenting process and argues that the socioecological and socioeconomic contradictions of the proposed mine are regulated and de-politicised by the Forest Service. The analysis suggests that the written responses and amendments to the Final EIS correspond to three limited 'levels' of effectiveness in respect to public influence: *mitigation*, in which additional measures are incorporated to address or reduce impacts of the mine; *legitimation*, in which scientific rationales are reinforced by expanding the scope and rigour of analyses; and *disavowal*, in which arguments are rejected on scientific or legal grounds. While mitigation represents the upper limit of effectiveness, foreclosing upon all fundamental political opposition to the project, the overwhelmingly predominant forms of response are legitimation and disavowal. The chapter concludes by arguing that the democratic capacity of the NEPA EIS public involvement process is structurally delimited by institutional norms and conflicting legal mandates.

Drawing upon interviews and other intensive field-based methods, in Chapter 6 I describe a more complex space of social engagement that extends beyond the participatory arrangements of NEPA and the way in which democracy is institutionalised and depoliticised. Here, hierarchical relations of power are reproduced through disciplined institutional agents who subscribe to a political-economic consensus served by the discursive de-politicisation of the contradictions of mining. Otherwise, power is articulated through actors who perceive statutory, constitutional and personal limitations upon the discretion they are able to exercise in the EIS process. In some cases, however, locally embedded cooperating agency employees are able to exercise relative levels of autonomy from these power structures, giving them greater scope to interrogate, alter, resist and/or even subvert the NEPA EIS decision-making process. Meanwhile, in non-state spaces of heterogeneous association, actors are variously engaged in antagonistic strategies of re-politicisation. These tactics, which may significantly alter the trajectory of institutional decision-making processes, include

knowledge production and dissemination; political lobbying; manipulation and/or exploitation; litigation; and direct dissent and disruption.

In Chapter 7, I return to the above research questions and discuss how they were answered over the course of the thesis. This includes paying attention to the debates that link science, policy and democracy and post-political theories, to which the research was intended to contribute (RQ4). The overall contribution of the thesis is discussed in respect to the aims, objectives and gaps in knowledge highlighted in chapters 1 and 2. Recommendations, in the context of the empirical case study, focus on the actions that different stakeholders may take forward to improve practice, policy and theory. The chapter also reflects on the research process, and considers some alternative research strategies and possible future lines of research.

### 1.5. Conclusion

This chapter has introduced NEPA as a key space of environmental governance in which democratic participatory arrangements have been implemented. The empirical research conducted for this thesis was situated at the nexus of water and mining, taking its lead from political-ecological analyses of socio-natural relations. In summary, this thesis explores the tensions between the implementation of legislation designed to protect environmental resources on one hand, promote their commodification on the other, whilst also facilitating public participation in the process. Building on recent debates within geography surrounding 'the political', it contributes to perspectives on the consensual or coercive means by which antagonistic interests are reconciled toward legitimate (or illegitimate) policy decisions. Critically, it challenges mainstream definitions of the political insofar as they may, advertently or inadvertently, foreclose upon certain opportunities for more open public engagement with contentious issues. In other words, what the research conducted here seeks to shed light upon is the democratic capacity of participatory approaches to environmental governance, policy, institutional decision-making processes and institutions themselves.

## **2. Democracy, science, nature and space: macro, meso and micro-level debates**

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This chapter comprises a review of the academic literature within which the research conducted for this thesis is situated. Following the same schema introduced in Chapter 1, it addresses the *macro*, *meso* and *micro* registers of inquiry, which in turn correspond to the four research questions identified. The chapter begins at the *meso*-level, outlining in Section 2.1 the emergence of a new emphasis on ‘public participation’ in supra-national discourse and domestic policy toward the end of the 20<sup>th</sup> century. Three broadly geographical literatures are reviewed: the first on public participation generally; the second on the significance of the interface between science, policy and decision-making in this context; and the third on focussing specifically on its implementation in EIA and NEPA specifically. The case for increased public participation is juxtaposed against critical accounts of its implementation, often in the form of typologies and spectrums with an implicit normative democratic emphasis. Science and technology studies (STS) have developed one aspect of these critiques, calling into question the status of certified scientific knowledge and the interests it serves. The EIA literature similarly focusses more on critiques of the linear-rational models and the need for a more pluralistic theoretical underpinning. The need for contributions which focus on outcomes rather than participatory process is recognised, it is further argued that there exists a space in the literature for an analysis of the institutional response to public input (RQ1 and RQ2).

Moving up to the *macro*-level, in Section 2.2 the theoretical influences on the practice of democratic environmental governance are reviewed. I outline the deliberative turn in democratic theory, which has widely informed the creation of participatory arrangements in planning and environmental governance. Recent critical engagements with deliberative democratic theory, which contend that ‘consensual’ approaches foreclose upon antagonisms that constitute ‘the political’ and serve to preclude oppositional critique of neoliberal rationales, are then reviewed. These ‘post-political’ or ‘post-democratic’ theories are situated as a branch of post-structuralist thought which, since Foucault, has sought to explicate the relationship between knowledge, power, and the discursive means through which subjectivities are produced. It is to this debate in political theory and human geography that this thesis aims to offer an empirical contribution (RQ4). It is argued that while considerable critical attention has been paid to democracy and depoliticisation in the field of urban planning, situated accounts of the practice of environmental and social impact assessment are relatively rare in this respect.

Section 2.3 moves on from Foucauldian perspectives on institutional spaces of discipline and government, to a review of subsequent developments in post-structuralist thought. Rooted in anti-essentialist critiques of science, the field of science and technology studies (STS), its major branch of actor network theory (ANT) and the discipline of Political Ecology provide rich literatures that

theorise and explore the multifarious networks of human and non-human actors and spaces through which knowledge, power, autonomy and equality are contested (RQ3). Here, the empirical lens is simultaneously widened and focused, acknowledging both multiplicity and specificity, and employing intensive, qualitative approaches to apprehend at the *micro*-level what Michel Callon (1998) called ‘hot situations’ that shed light on the relationships between power, science, policy and decision-making.

Finally, the literature reviewed in Section 2.4 contextualises the case study chosen for this research (discussed in greater depth in Chapter 3) in respect to the historical development of the southwestern United States and the State of Arizona, with particular emphasis on the importance of water resources and mining.

### 2.1. ‘Participatory’ democracy and governance – *meso*-level debates

Democracy refers to the idea that all members of a political society have the right to an equal say in determining its structure and activities. Political rule, in other words, should not only be accountable, but should, to some degree, rest in the hands of the demos (Forrest 1966). Long after its advent in ancient Greece, this democratic principle became ensconced in an emerging post-feudal consciousness either side of the Atlantic Ocean: in Europe, in the revolutionary French republic; and in the new American nation, following a civil war fought over its antithesis, slavery. In his famous speech, that many United States citizens can still recite today, Abraham Lincoln dedicated the blood-soaked ground at Gettysburg – the turning point of the American Civil War – to those who had fought and perished for the idea that:

all men [sic] are created equal [...] that this nation, under God, shall have a new birth of freedom—and that government of the people, by the people, for the people, shall not perish from the earth.

As the United States has grown into its role as leader of the western world, commitment to democracy as a normative ideal among western governments has since become almost absolute. Following the end of the cold war, the opening up of government to ‘public participation’ received a significant impetus. It emerged principally in relation to environmental issues, as part of the redirection of international attention away from the former Soviet Union and towards the increasingly apparent links between ecological crises and global development. The principle of public participation was established as a supranational developmental discourse in the United Nations 1992 Rio Declaration on Environment and Development, with Principle 10 stating that:

Environmental issues are best handled with participation of all concerned citizens, at the relevant level. At the national level, each individual shall have



appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided (UNCED 1992).

Public participation has since been adopted as a cornerstone and fundamental function across democratic environmental governance. In 1998, the United Nations (UN) 'Aarhus Convention' created a legal obligation for UN member states to promote access to information and public participation in environmental matters (UNECE 1998). In turn, the UN's 2000 Millennium Development Goals, and the subsequent 2015 Sustainable Development Goals emphasised the need to support and strengthen the participation of local communities in ensuring the availability and sustainable management of water and sanitation for all (United Nations 2015, United Nations 2017). Participatory requirements have been transposed to regional scales of governance, such as in the European Union through the European Commission's *Water Framework Directive* (WFD); and subsequently down to the scale of nation states, with these supranational legal frameworks and multilateral arrangements and their attendant participatory requirements, adopted as national policy.

Institutions thus widely assert that public participation is a key factor in better decision-making on environmental issues that are increasingly contentious, particularly given the pressures of climate change and population growth. It has been claimed that public participation has normative benefits in terms of achieving democratic ideals, and pragmatic benefits in terms of improving the quality and durability of policy decisions (Reed 2008). Normative claims include those of inclusivity, fostering public trust, knowledge co-production and social learning. The latter two benefits also factor in the pragmatic register, acknowledging the importance of situated knowledges and establishing long-term public support. Literature in relation to these normative and pragmatic claims, which Reed (2008) suggests delineates arguments often used to describe the benefits of participatory approaches, are summarised in Table 2.1.

As Reed (2008) concludes however, the claimed benefits of participation have not always been realised, and its theory and practice has met with an upwelling of critical accounts (Barnett and Low 2004). Indeed, there also exists a further body of literature that critiques the need to enhance public participation in environmental governance in general. Notwithstanding questions over whether the

**Table 2.1 - Summary of the suggested benefits of adopting a participatory approach divided into normative and pragmatic claims (references cited in Reed 2008).**

<b>Normative claims</b> <b>(Benefit for democracy)</b>	<b>Pragmatic claims</b> <b>(Quality and durability of decisions)</b>
Increase the likelihood that stakeholders on the margins of society are included in decision-making processes (Martin and Sherington 1997)	Deliver higher quality interventions and technologies that are suitable for the socio-cultural and environmental conditions, meeting the needs of the people (Reed 2007, Reed and Dougill 2010)
Increases public trust in decisions – participatory processes should be transparent, considering different viewpoints (Richards <i>et al.</i> 2004)	Increase the rigour of research by providing high quality input data (Hansen 1994, Reed <i>et al.</i> 2006, 2008)
Empower stakeholders through increasing their ability to understand and use co-generated knowledge (Okali <i>et al.</i> 1994)	Incorporating local views into the design early can increase the success in achieving the needs and priorities of participants (Dougill <i>et al.</i> 2006)
Promote social learning, whereby the participants learn from each other through the participatory process, as well as raising the importance of recognising each participants viewpoints (Blackstock <i>et al.</i> 2007, Fritsch and Newig, 2009)	Building trust between participants and establishing a common ground can build a sense of ownership of the project resulting in long-term support, and subsequently increasing the likelihood of the implementation of outputs of decision-making processes (Richards <i>et al.</i> 2004, Stringer <i>et al.</i> 2006)
Reduce the probability that environmental decisions are seen as unfair, as participatory processes include a diverse range of views (Richards <i>et al.</i> 2004)	Deliver high quality decisions by preventing the occurrence of negative outcomes through the increased completeness of data and knowledge created on an issue (Fischer 2000, Beierle 2002, Koontz and Thomas 2006, Fritsch and Newig 2009).

potential benefits can be realised that are discussed in the following sections, a number of authors have highlighted the real potential disadvantages of enhancing participation. These include examples where decision-making is slowed by a tendency for participatory processes to become ‘talking shops’ that create ambiguities (e.g. Bojórquez-Tapia *et al.* 2004, Vedwan *et al.* 2008). Moreover, it has been shown that participation may even degrade environmental decision making more often than improving it (e.g. Coglianese 1997, 1999, Rossi 1997, Sunstein 2001, 2003, 2006). Nevertheless, as discussed below, this thesis interrogates how public participation plays out on its own terms, within a certain institutional and situational context. Key aspects of this perspective are the interplays between power, knowledge, discourse and policy.

### 2.1.1. The ‘tyranny of participation’

Numerous ‘typologies’ of participation have been put forward which imply a normative axis of ‘good’ to ‘bad’ participation (Cornwall 2008). Sherry Arnstein’s (1969) “Ladder of Citizen Participation” is the seminal example. With a foot on the ‘bottom rung’ of her ‘ladder’ (Figure 2.1), Arnstein begins

with forms of “non-participation”, in which the state acts to legitimise its actions through coercive forms of “education.” Looking farther up the ladder, despite concessions made to give voice to participants, Arnstein sees acts of information provision and “consultation” as ineffectual “tokenism.” Meanwhile, towards the top of the ladder – and, by implication, the ultimate goal of democratic decision-making – are arrangements in which at least a portion of the power is delegated to those with an interest in the issue at hand. Thus “partnership” and even “citizen control”, at the very summit, are examples of the most egalitarian forms of relationship between the state and civil society (Arnstein 1969).

It is notable that the activities Arnstein (1969) associates with ‘tokenism’ can often be identified in the institutional discourses and legislation which claim to promote participation. The World Bank, for example, includes both giving information and consultation as forms of participation, and goes on to equate the provision of information with “empowerment” (Cornwall 2008). Such framings hint at Arnstein’s characterisation of tokenism, whereby:

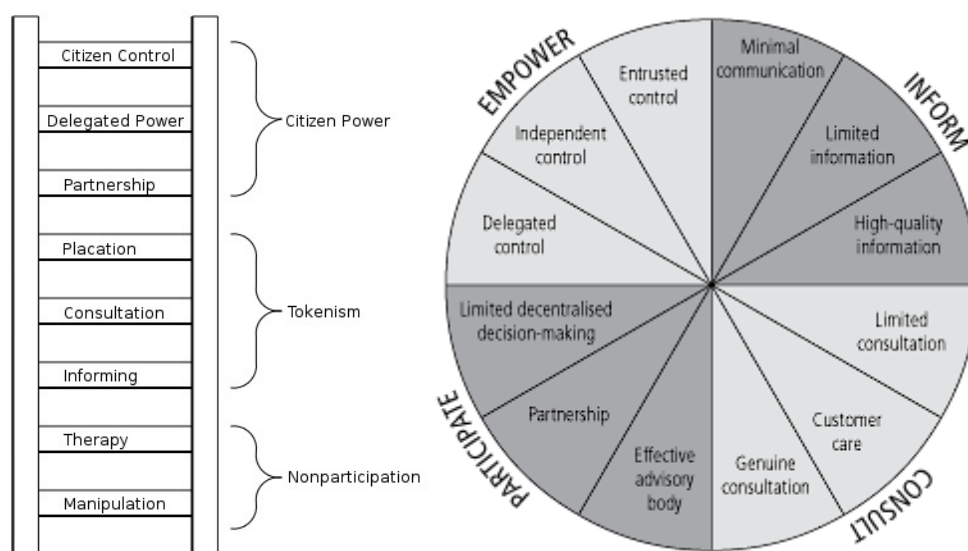
citizens may indeed hear and be heard. But under these conditions they lack the power to ensure that their voices will be *heeded*. When participation is restricted to these levels, there is no followthrough, no ‘muscle,’ hence no assurance of changing the status quo (Arnstein 1969: 217, original emphasis).

Over the proceeding half century, the ladder has become an enduring part of academic enquiry, policy and practice as a device to critique, design, implement and evaluate participatory processes (Collins and Ison 2009). Pretty (1995) similarly describes a spectrum defined by a shift from control by authorities to control by the people or citizens. White (1996), meanwhile, distinguishes between the conflicting aims of participation between practitioners and participants, such as *legitimation*, *leverage*, and *empowerment*. Callon (1999) suggested three models of public engagement in scientific decision-making: the “Public Education Model”; the “Public Debate Model”; and the “Co-production of Knowledge Model” (see also Rowe and Frewer 2000). Callon’s formulation implies a progression from the top-down flow of knowledge, which is increasingly losing its legitimacy; to a bottom-up inclusion of multiple, uncertified ‘lay’ knowledges which challenge the positivist, universal laws of ‘certified’ science (Callon 1999).

Following Arnstein, for an increasing number of commentators, the need to engage the public more directly in policy development and decision-making and planning has been seen an “increasingly hegemonic” (Bickerstaff and Walker 2005) discourse, a “pervasive rhetoric” (ibid: 2123), and even “an act of faith” (Cleaver 1999). Goldin (2013) summarises the criticisms of participation into ‘four fatal flaws’. Firstly, the failure of the state to commit the required resources (Goldin 2010, Goldin

2003). Secondly, the use of participatory processes as a method of coercion to legitimise a predetermined agenda (Cooke and Kothari 2001). Thirdly, participatory processes tend to focus on the form rather than the substance, resulting in an overemphasis on the execution of the participatory techniques, making participatory processes feel like ‘managerial exercises’ (Clever 2001, Harris *et al.* 2013) Finally, more often than not participation is left as a vague term, resulting in those creating and involved in participatory research drawing different meanings as to what the process and outcomes should be (Goldin 2010, Goldin 2003).

As an organising metaphor for participation, the ladder has become the focus of considerable critical evaluation. These critiques highlight a number of assumptions implicit in Arnstein’s framing. Davidson (1998) proposed a ‘wheel of participation’ (Figure 2.2), arguing that the level of engagement required is highly dependent on the contextual situation. A linear notion of participation thus implies that the context remains constant, and neglects the importance of feedback loops or variations in the implementation of the process itself (Bishop and Davis 2002).



**Figure 2.1 (left) – Arnstein’s ‘Ladder of Citizen Participation’ (1969). Source: adapted from ‘Diagram showing Sherry Arnstein’s ‘Ladder of citizen participation’ by DuLithgow licenced under CC BY 3.0.**

**Figure 2.2 (right) – ‘Wheel of Participation’, adapted from Davidson (1998).**

Similarly, Campbell and Marshall (2000) contend that academics and decision makers often assume that the higher rungs on Arnstein’s ladder are the desired outcome. Others have argued that participation is not hierarchical in nature, with “citizen control” as a goal irrespective of participants own expectations or reasons for engaging in matters of concern (Choguill 1996, Tritter and McCallum 2006). Collins and Ison (2009), meanwhile, point out that the roles and responsibilities of participating individuals are often based on the construction of their interest in the situation.

Other arguments have focused on examples from the developing world to contend that it is vital to pay closer attention to who is participating, in what, and for whose benefit (Cornwall 2008). Participation, in other words, does not take place in a power vacuum, and may have unexpected and potentially negative interactions with existing hierarchical structures (Kothari 2001). For example, participatory spaces may reinforce existing privileges which discourage minority perspectives from being expressed (Nelson and Wright 1995), thus creating “dysfunctional consensus” (Cooke 2001: 19). Cooke and Kothari (2001: 4) go so far as to state the case for participation as a “new tyranny” which facilitates “the illegitimate and/or unjust exercise of power” through a modernist and instrumentalist project, guilty of entrenching rather than destabilising relational inequalities.

These areas of concern all point towards an appreciation of participation as a more complex ‘mosaic’ (Tritter and McCallum 2006), in which the issues at hand may be loosely defined and/or highly contested. For her part, Arnstein acknowledged that her eight-rung ladder is an over-simplification, but maintained the basic point – that there are significant gradations of citizen participation (Arnstein 1969). This thesis seeks to contribute to perspectives at the *meso*-level of policy through an interpretation of the institutional responses to public comments on an Environmental Impact Statement. Critically, however, the latter constitutes one aspect of a research approach which, as described in Chapter 3, links to a more nuanced understanding of power relations at work in ‘democratic’ spaces of governance, and how they might be shifted. Beyond normative concerns, this points to the dominant role of scientific expertise and its interface with policy that has been a focus for research over recent years. This literature is reviewed in Section 2.3, which links into the approaches used by political ecologists as a means to achieve an understanding of the relationships between power, science, policy and decision-making.

#### 2.1.2. NEPA and public participation in impact assessment

Around two decades after its enactment, the CEQ commissioned a number of reports which reviewed the effectiveness of NEPA, including in respect to its collaborative, consensus-building and public involvement aspects (CEQ 1997, CEQ 2003, NECRAC 2005). Emerging from this period of introspection was a recognition that the desired level of public involvement was not always achieved, and the commonly held perception of the NEPA EIS process as a “one-way communications track” that does not use public input effectively, and leaves litigation as “the only means to affect environmental decisions significantly” (CEQ 2007a). In response, in 2007 the CEQ published a handbook for NEPA practitioners entitled ‘Collaboration in NEPA’, in which it emphasised that “collaborative approaches to engaging the public and assessing the impacts of federal actions under NEPA can improve the quality of decision-making and increase public trust and

confidence in agency decisions” (ibid). To assist federal agencies in expanding the effective use of collaboration as part of the NEPA EIS process, the CEQ handbook provided guidance on the approaches which should be used by federal agencies to engage the public at each stage of the NEPA EIS process (CEQ 2007a).<sup>20</sup>

Advising that methods should be appropriate to the specific context of the proposal in question, the CEQ handbook recommends various approaches to public involvement across a “Spectrum of Engagement” for each stage of the NEPA EIS process. Four ‘levels’ of engagement, are set out (see Table 2.2). Beginning with the level of least shared influence with parties, these levels are to: inform, consult, involve, and collaborate. The handbook seeks to characterise the extent of participation at each level, stating that:

At the Inform level, the agency informs interested parties of its activities. At the Consult level, the agency keeps interested parties informed, solicits their input, and considers their concerns and suggestions during the NEPA EIS process. Here the agency consults with parties without necessarily intending to reach agreement with them. At the Involve level, the agency works more closely with interested parties and tries to address their concerns to the extent possible give the agency’s legal and policy constraints. At the Collaborate level, parties exchange information and work together towards agreement on one or more issues at one or more steps in the NEPA EIS process (CEQ 2007b).

In its accompanying ‘Citizens Guide to NEPA’, the CEQ suggests that public meetings “may be held in a variety of formats” (CEQ 2007a). A number of methods are named as appropriate to various levels of engagement, including public commenting, public meetings, and the ‘open house’ sessions (see Table 2.2). Open houses are identified as appropriate for the scoping, Draft EIS and Final EIS review stages of the NEPA EIS process, corresponding to the ‘inform’ level of engagement at which the goal is to “[p]rovide sufficient objective information for parties to understand the issues being addressed” (CEQ 2007b). The guidance permits considerable discretion for federal agencies in terms of the types of engagement that may be used at different steps in the NEPA EIS process, and offers no prescription as to what the approaches may entail, focussing instead on the collaborative end of the spectrum in which ‘deliberation’ and ‘consensus building’ between cooperating agencies are emphasised.

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<sup>20</sup> As argued in thesis, the interpretation of this guidance by the Forest Service in the case of the proposed Rosemont Copper Project (particularly in relation to ‘open houses’ and ‘public hearings’) emerges as a key issue in which public contention over the legitimacy of the approaches to public involvement has a direct impact upon the trajectory of the NEPA EIS process.

It is notable that in its adaptation of the Public Participation Spectrum from the International Association for Public Participation, the CEQ omits the latter’s most impactful level of engagement: to *empower*, placing “final decision making in the hands of the public” and promising to “implement

**Table 2.2 – The CEQ’s “Spectrum of Engagement in NEPA decision-making” (CEQ 2007b).**

	INFORM	→ CONSULT	→ INVOLVE	→ COLLABORATE
<b>Agency Commitment:</b>	Provide parties with comprehensive, accurate and timely information about its NEPA decision-making.	Keep parties informed and consider their concerns and suggestions on the NEPA process. Provide documentation of how their input was considered in the decision-making process.	Communicate with parties to ensure that suggestions and concerns are addressed and reflected within legal and policy constraints when assessing environmental effects during the decision-making process. Provide iterative feedback on how their input is considered in the decision-making at various steps during the NEPA process.	Work directly with parties at one or more stages of the NEPA process, seeking their advice and agreement on: the purpose and needs statement, alternatives, collection and use of data, impact analysis, development of a preferred alternative, and/or recommendations regarding mitigation of environmental impacts.
<b>Agency Goal:</b>	Provide sufficient objective information for parties to understand the issues being addressed through the NEPA process.	Obtain feedback on issues in NEPA process, the alternatives considered, and the analysis of impacts.	Consistently solicit and consider parties’ input throughout the NEPA process to ensure that parties’ concerns are understood and addressed before the analysis of impacts is concluded and a final decision made.	Directly engage parties in working through aspects of the NEPA process potentially including the framing of the issues, the development of a range of reasonable alternatives, the analysis of impacts, and the identification of the preferred alternative – up to, but not including, the agency’s Record of Decision.
<b>NEPA Phase:</b>	Scoping, draft and final review and comment periods	All phases	All phases	All phases
<b>Processes:</b>	Fact Sheets, Newsletter, Web Site, Open House, Panel Presentations, Public Meetings.	Notice and Comment, Surveys, Focus Groups, Consultation, Tribal, State, Public Meetings.	Workshops, Deliberate Polling, Individual and/or group consultations, advisory committee.	Individual and/or group consultations, advisory committee, consensus-building, facilitation, interagency working groups, mediation, joint fact finding.

what [the public] decide” (IAPP 2014). Indeed, even in relation to the ‘consult’ and ‘involve’ levels, the guidance qualifies that consultation does not necessarily imply the intention to reach agreement, and that concerns are addressed to the extent possible give the agency’s legal and policy constraints. Similarly, the CEQ’s spectrum of engagement strongly resembles the typologies of participation highlighted above, albeit making no concessions to ‘citizen power’ or ‘knowledge co-production’.

In relation to public commenting, meanwhile, the CEQ regulations provide guidance on how the comments received during the public involvement should be used. The regulations require that comments meet particular standards to be recognised and potentially impact agency planning. In the scoping stage, comments need to be ‘significant’, while comments received after the later publication of the Draft EIS should be ‘substantive’.<sup>21</sup> While the interpretation of this guidance varies between federal agencies, the Forest Service has clarified what it means for a comment to be ‘significant’ or ‘substantive’ in their own NEPA guidance documents. To receive the agency’s full consideration, comments must not be based on ‘opinion’, nor should they be ‘conjectural’, but must be scientifically-based or be expressed in terms of effects (see Table 2.3) (USFS 2012).

NEPA has always been of particular significance to the United States Forest Service, who as a federal agency of the United States Department of Agriculture are responsible for the management of the country’s National Forest System, which comprises 31% of public land in the country. While the Bureau of Land Management maintains the largest portfolio (40%), the Forest Service has historically emphasised different priorities relating to the protection of the environment (Vincent *et al.* 2014). As well as forests, Forest Service lands frequently incorporate designated wilderness areas, sensitive habitats and significant water flows.

The Forest Service Handbook (USFS 2012), requires that all substantive comments on the Draft EIS are individually and collectively reviewed, analysed and evaluated, with each receiving a response to be published in the Final EIS. When the number of comments is exceptionally voluminous, the responsible official is given discretion to determine that a summary of responses is appropriate. Thus, comments that are pertinent to the same subject may be aggregated by categories (USFS 2012). The method typically employed here is a process called ‘content analysis’, which is a “systematic method of compiling and categorizing the full range of public viewpoints and concerns regarding a plan or project [...] intended to facilitate good decision-making by helping analysts to

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<sup>21</sup> 40 CFR 1503.4 (b)



clarify, adjust, or incorporate technical information into a planning document.”<sup>22</sup> Once analysed, the response to each comment or group of comments must clearly state one of the following has been actioned:

- Modify alternatives including the proposed action.
- Develop and evaluate alternatives not previously given serious consideration by the agency.
- Supplement, improve, or modify its analyses
- Make factual corrections.
- Explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response.

Meanwhile, the CEQ guidance emphasises that, notwithstanding these extensive requirements to solicit and acknowledge public input, decision-making still resides with the agency. Indeed, they state that “[c]ollaboration does not turn the NEPA EIS process into one in which an agency’s responsibility to make sound decisions is replaced by how many votes are cast for a particular option or alternative” but “does enable decision makers to consider any consensus that may have been reached among the interested and affected stakeholders, furthering the lead agency’s ability to make informed and timely decisions” (CEQ 2007a). Thus, while substantive engagement with deliberative democratic theory has largely been evaded by the impact assessment community, the emphasis on consensus-building within participatory spaces has been adopted within the regulatory guidance under NEPA. As Butler (2013) highlights, however, public land management agencies are vested with the authority to make decisions that cannot be relinquished to a collaborative group. Thus, personnel have to navigate a core tension between engaging in collaborative dialogue and preserving agency authority.

The participatory elements of the NEPA EIS process have been the object of analysis and critique to the extent to they achieve their democratic aims. A number of authors have shown how ambiguities in NEPA guidance gives broad discretion to federal practitioners, which allows for the recreation of NEPA's critical tasks from process to process, and suggests that the outcomes of NEPA EIS processes may be powerfully driven by the particular practices, dispositions, values, attitudes, situations, and beliefs of those actors (MacGregor and Seesholtz 2008, Predmore *et al.* 2011, Stern *et al.* 2009). A distinct separation of the public involvement processes from the impact assessment and analyses proper, and from the final decision point, has been a recurring criticism in this literature

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<sup>22</sup> See Appendix 6.11

**Table 2.3 - Interpretations by the CEQ and the Forest Service concerning how to handle public comments received through the NEPA EIS process (Predmore *et al.* 2011)**

Interpretations of NEPA public involvement (Source)	Timing
Use “. . .the scoping process not only to identify significant environmental issues deserving of study, but also to de-emphasize insignificant issues, narrowing the scope of the environmental impact statement accordingly” (CEQ, 40 CFR 1500.4(g)).	Scoping
Non-significance is defined as those comments that are “conjectural in nature and not supported by scientific evidence”. “Non-significant issues” are unlikely to be used to “formulate alternatives” (USDA Forest Service Forest 2007, Unit 9: 3–4).	Scoping
Responsible official is directed to “consider all substantive comments” (CEQ, 36 CFR 215.6).	Draft EIS
Non-substantive comments are those that “do not warrant a detailed response” and this includes those that are “just opinion, general comments, or position statements”. Non-substantive comments do not warrant detailed consideration because they do not cover ‘effects’ and instead are about “their like or dislike for the proposal” (USDA Forest Service 2007, Unit 14: 20).	Draft EIS

(Hoover and Stern 2014, Poisner 1996, Stern 2010). Predmore *et al.* (2011) argue that the emphasis on ‘public disclosure and improvement’ by practitioners of NEPA public involvement processes suggests a strong emphasis on those aspects that are legally required, to the detriment of stakeholder relationships. Others have advocated for additional attention to participants beyond ‘informing and disclosing’ (Force and Forester 2002, Stern *et al.* 2009).

It has been contended that NEPA is used as a vehicle by those who oppose federal projects to litigate on the grounds of failure to comply with environmental legislation (be it NEPA, the Endangered Species Act, or other federal and state-level statutes) (Twelker 1990). However, in serving only to exchange information, it has been argued that the NEPA EIS process fails to encourage any discourse relating to cultural values or what outcomes constitute the public good. As a result, the public hearings become a space in which the public, in the knowledge that their input is invalidated and excluded, engage instead in strategic speech and political manoeuvre (Poisner 1996). Predmore *et al.* (2011) suggest that NEPA reinforces a rationalist planning paradigm rooted in the CEQ’s NEPA regulations and to agency planning guidelines that direct employees to address only ‘substantive’ or ‘significant’ comments which are received during public comment periods. This delineation between ‘substantive’ and ‘un-substantive’ public input works to ‘construct’ representations of the public by

privileging those who are able to communicate in scientific and legal terms over those who cannot, with latter group typically abstaining or withdrawing from the participation process (ibid).

Relatedly, broader debates surrounding the nature of impact assessment in terms of a critique of the technocratic, 'information processing' or 'linear rational' model of decision-making have been taking place since the late 1990s (Ortolano and Shepherd 1995). It has thus been argued that the trend towards the adoption of democratic principles in impact assessment has been slower than in other fields, such as urban planning (Adelle and Weiland 2012, Esteves *et al.* 2012). The basis for the rationalist model was the adoption of a rational process of analysis of all the relevant information necessary to guide the choice, from a range of alternatives, of the best solution for a defined problem or need. The approach is characterised by a strong technical emphasis, with planners and other professionals acting as objective processors of information, producing independent evaluations of the alternatives, to be provided to decision-makers (Lawrence 2000). The form of institutionalised impact assessment that emerged with NEPA in the 1970s and still dominates in many countries is strongly influenced by this model (Morgan 2012). More recently, authors have pointed to three broad areas of concern in relation to impact assessment, each of which are central to participatory aspects: theoretical concerns for the nature and purpose of the approach and the relationship to decision-making processes; problems associated with the practice of impact assessment; and the effectiveness of the processes implemented (Morgan 2012, Ortolano and Shepherd 1995, Pope *et al.* 2013).

The major share of these literatures focusses on the level of practice and often present increased participation as highly desirable, seeking to offer perspectives on how it might be made more effective (Bowd *et al.* 2015a, Charnley and Engelbert 2005, Chávez and Bernal 2008, Del Furia and Wallace-Jones 2000, Diduck *et al.* 2007, Doelle and Sinclair 2006, Glucker *et al.* 2013, Hartley and Wood 2005, Lockie *et al.* 2008, O'Faircheallaigh 2010, Palerm 2000, Salomons and Hoberg 2014, Shepherd and Bowler 1997, Sinclair *et al.* 2008). Some argue for procedural improvements and normative principles to foster more meaningful public involvement, preventing conflict and consensus (Charnley and Engelbert 2005, Del Furia and Wallace-Jones 2000, Diduck *et al.* 2007). However, others propose a shift from process to outcome-based assessment (Doelle and Sinclair 2006), while emphasising the potential for co-production of scientific knowledge upon which decision-making should be based (Bowd *et al.* 2015b). Lockie *et al.* (2008) highlight the tendency to separate community participation from the conduct of impact assessment, suggesting an approach focused on expectation and image management than on participation in decision-making and the ignorance of negative social and economic impacts.

Lawrence (1997: 81) argued for more attention to be paid to theory-building in impact assessment, arguing that such a contribution is essential to “further understanding of human activity, the environment, and critical interactions between the two.” The response to this call drew upon a number of related and better-theorised fields, including political science (e.g. Bartlett and Kurian 1999), policy (e.g. Kørnøvn and Thissen 2000), decision theory (e.g. Nitz and Brown 2001) and planning theory (e.g. Hildén *et al.* 2004). Bartlett and Kurian (1999) adopt a political science perspective and identify six models they consider to have been implicit in previous discussions of EIA in the literature: the information processing model; the symbolic politics model; the political economy model; the organisational politics model; the pluralist politics model; and the institutionalist model (see Table 2.4). Similarly, Lawrence (2000) examined five planning theories: rationalism, pragmatism, socio-ecological idealism, political-economic mobilization, and communications and collaboration. Leknes (2001) uses a simpler three-fold categorization of decision-making approaches: the rational, new institutionalist, and negotiation perspectives. O’ Faircheallaigh (2010) focusses more clearly on the participatory element, suggesting a three-fold

**Table 2.4 – Bartlett and Kurian’s (1999) theoretical models of EIA decision making.**

Information processing model	Essentially the rationalist, decision-support model
Symbolic politics model	EIA used to suggest accordance with certain values, but not necessarily holding to those values
Political economy model	EIA used by the private sector to reduce financial risk, and if possible increase financial opportunities, by internalizing environmental externalities
Organizational politics model	changes occur in the internal politics of organizations required to use EIA
Pluralist politics model	EIA process used to open opportunities for negotiation and compromise among different interest groups
Institutionalist politics model	Political institutions are changed significantly by the effect of EIA on values, actions and perspectives in their policy-making processes

classification its purpose in EIA: obtaining public input into decisions; providing some degree of public sharing of decision-making; and altering the structures and power relationships of decision-making. However, rather than a static framework or model with rigid boundaries, O'Faircheallaigh sees a dynamic relationship between these three forms of participation (ibid). Diduck *et al.* (2007) envisage changes in the structure and power relationships of decision-making, and the development of constructive relationships between public, proponents and decision-makers. Lostarnau *et al.* (2011), meanwhile, highlight the importance of specific social, political and cultural settings and traditions in determining the development and practice of these processes. Mutual understanding of these contexts, it has been argued, can only come about by learning, and this has been reflected in several case studies that emphasize the importance of different forms of social and organizational learning, through participatory approaches to impact assessment (Lostarnau *et al.* 2011, Reed *et al.* 2010, Tippett *et al.* 2005).

Each of these models imply a progression from top-down rationalism, toward a more pluralist framing. However, they are by no means fully accepted, and tend to oversimplify, reflecting the lack of theoretical maturity associated with research in this field (Pope *et al.* 2013). More recent research has tended to place greater emphasis on empirically evaluating impact assessment practices against theories of collaborative participation or deliberative democracy. Many of these have argued that the prevalent rationalist framings should be supplanted by Habermasian, deliberative, collaborative, communicative approaches which have been widely adopted in the planning discipline (e.g. Hourdequin *et al.* 2012).

Despite the rhetoric and concerns that have been expressed, there have been relatively few attempts to empirically validate the many claims that have been made for or against participatory approaches. The exceptions have tended to emphasise evaluating the process rather than the outcomes (e.g. Beierle 2002, Blackstock *et al.* 2007, Brody 2003, Renn *et al.* 1995, Rowe and Frewer 2000, Webler 1999). There has been a focus on understanding participant perceptions of what makes a good or bad, effective or ineffective participatory process (e.g. Blackstock *et al.* 2007, Chase *et al.* 2004, Webler and Tuler 2006), and practitioner perspectives have been similarly addressed (e.g. (Hoover and Stern 2014, MacGregor and Seesholtz 2008, Predmore *et al.* 2011, Stern *et al.* 2009). Those which have attempted to assess the outcomes of participation have predominantly done so in terms of environmental or social objectives, often analysing multiple cases (e.g. Beierle 2002, Brody 2003, Chess and Purcell 1999, Sultana and Abeyasekera 2008). Koontz (2005) conducted a multi-case analysis of the extent to which stakeholder participation influenced the

recommendations of community-based task-forces developing local farm preservation policy in the United States.<sup>23</sup>

However, a high proportion of academic contributions to this area focus on impact assessment in the general sense (e.g. Esteves *et al.* 2012, Glucker *et al.* 2013, Morgan 2012). There is some sectoral focus, though this is predominantly in relation to hydropower (e.g. Chávez and Bernal 2008, Diduck *et al.* 2007); yet few relate to specific immanent examples of proposed mineral resource developments such as is provided by this thesis. The research conducted for this thesis is unique in its application of an extensive thematic analysis of the substantive impact of public input into an impact assessment for a single case study, such as has been for this research. Nor has such an approach previously been combined with an 'intensive' analysis of the means by which participation is mediated through discursive relations of power, relative autonomy and heterogeneous networks of association. As the following section discusses, these latter themes are central to the macro-level post-structural theories of the political that this thesis offers a perspective on.

## 2.2. Democratic theory: *macro*-level debates

Since the 1970s, engagements with democratic theory in human geography and related spatial disciplines have remained faithful to the terms of a contrast between theories of 'deliberative democracy' on the one hand, and post-structuralist theories of radical democracy and 'agonistic pluralism' on the other. In this framing, as will be discussed in this section, the consensual orientations of deliberative democrats are juxtaposed against those for whom social life is ineradicably shaped by power (Barnett 2012). Thus follows a discussion of the deliberative turn in conceptualisations of democracy, which first challenged rationalist framings in the discipline of planning. Then, post-structuralist theorisations of what they see as the 'post-political' or 'post-democratic' nature of the widely adopted deliberative paradigm are introduced. Herein, consensual approaches are criticised for excluding those who do not consent, and for seeking to continue to impose a rationalist scientific discourse which serves the interests of political-economic power.

### 2.2.1. The deliberative turn

Prior to environmental movement, the advent of EIA and the participatory principle, the primary institutional decision-making arrangements that concerned themselves with the effects of development projects were those which fell under the umbrella of spatial planning. Until the 1970s,

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<sup>23</sup> Finding a significant effect in counties where the citizens and the elected officials were highly concerned about the issues involved, and where participants were connected with strong social networks that focussed on the issues being discussed.

the discipline was dominated by rationalist theories, whose value was seen in their 'objectivity' and its claims as a scientific enterprise with the associated kudos and respectability that accompanies it. Spatial planning thus focussed on the best way of producing results, where the practitioner applies a non-ideological, scientific rationality to various issues (Allmendinger 2009). By the 1980s, the approach had come to be criticised as an instrumental 'means' to reaching a limited number of preconceived 'ends', in which the ability of policy to be transformed is limited. A shift had begun towards more inclusive forms of decision-making, which were rooted in theories of 'deliberative democracy', largely from the work of Marxist scholar Jurgen Habermas.

Habermas saw the instrumentalisation of government logics as arising from the enlightenment period, which had given birth to the intellectual inheritance now labelled 'modernity'. The innovative forces of technological invention which had led to the industrial revolution, he argued, were released by a new materialist, objective, positivist focus of scientific enquiry, combined with economic organisation (Healey 1997). Habermas contended, however, that the rules of rationality are shaped by participation in a community (Sultana and Loftus 2012). For him, the task of politics is to create the conditions in which no party to the social dialogue can exploit or silence the other, since each person has equal access to the conversation. This 'deliberative democracy' gives voice to each citizen in what Habermas describes as an "ideal speech situation" (Habermas 1981, Habermas 1996) designed to guarantee discursive equality, freedom and fair play. His 'theory of communicative action' took speech – and specifically conversation – as a model of a social activity which is intrinsically meaningful to those who take part in it (Habermas 1981). In this formulation, no decisions are made without all voices having been heard. Thus, democratic legitimacy is achieved by the collective and critical evaluation of the institutions and the norms of society through discursive practice (White 1995).

Over the course of the 1990's, the terms 'communicative planning' (Forester 1989), 'argumentative planning' (Forester 1993), 'planning through debate', 'inclusionary discourse' (Healey 1992), and 'collaborative planning' (Healey 1997) were employed to describe and transform the concepts of Habermas into planning philosophy. In the latter, Healey argues that the giving of rights to be heard through inclusive procedures which foster mutual learning about the concerns of others must be met with responsibility on the part of the participants to listen, give respect and learn. She has argued for an approach that maps, organises and builds on the fine detail of the diversity of social relationships, networks and nodes that make up complex local economies and which respect the totality of interests in a given issue. Strategy should be developed through an iterative process of stakeholder mapping, assembling like-minded stakeholders into fora within which understandings

about an issue can be developed, debating substantive issues in open arenas of discussion, and giving good, clear, open reasons for taking one course of action rather than another (Healey 1997).

In the United Kingdom in the late 1990s, the language of collaborative planning dovetailed with the Blair Government's emphasis on 'decentralisation', 'participation', and 'community empowerment', and the 'third way' ethos of theorists such as Anthony Giddens (1998) and Ulrich Beck (1997). This outlook was based around notions of 'reflexive modernity', in which traditional ideological divisions of left and right are replaced by a new consensual politics produced through the interaction of a variety of stakeholders. Herein, a plethora of inclusive participatory spaces would emerge, in which a variety of actors would be engaged in addressing the increasingly complex challenges facing society. A central argument of this theory was that the traditional spaces of political participation were unsuitable for the challenges presented by reflexive modernity. Indeed, a variety of new 'deliberative' institutions were established, including citizen's juries, citizen's panels, in-depth discussion groups, consensus conferences, round tables, and focus groups to feed into policy (Mahony 2010).

Deliberative, consensus-based approaches have since been taken up extensively across other institutional settings at different scales. Such language is prominent in the United Nations Sustainable Development Goals, and in the stated aims of many other supra-national development agencies. For example, in developing a set of principles which became foundational to the concept of 'Integrated Water Resources Management' (IWRM), the 1992 'Dublin Statement on Water and Sustainable Development'<sup>24</sup> states that "[w]ater development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels" (ICWE 1992). These principles were subsequently translated into the European Union's *Water Framework Directive* (WFD), which obligated EU states to involve stakeholders and the general public in strategic planning through River Basin Development Liaison Panels and Consumer Challenge Groups.

Deliberative democracy has thus been seen as espousing forms of collective decision-making that are inclusive, reflexive and consensus-oriented in ways that enhance access to, and legitimacy of, a more transparent and accountable form of governance. In this view, rational discourse among equals allows all participants to open debate and interrogate others in a process facilitated impartially and based on universal principles such as justice and democracy (Calhoun 1991). Relative to rational planning and the more autocratic forms of governance that predated it, many aspects of

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<sup>24</sup> The Dublin Statement on Water and Sustainable Development was the primary output of the 1992 International Conference on Water and the Environment, held in Dublin.



the deliberative approach are praiseworthy in the normative sense. It seeks to recognise multiple and diverse stakeholders operating in an increasingly complex, pluralist and unpredictable world. It envisages an informed citizenry engaged in respectful interaction and dispute resolution. In essence, deliberative democratic approaches “seek to replace the argument of the greater force with the force of the better argument” (Brand and Gaffikin 2007: 292). However, as the next section describes, in light of continuing and emerging political and environmental crises, a growing body of thought has recently examined the deliberative turn in terms of the erosion of democracy.

### 2.2.2. Theorising the post-political

Foundational to the post-political/post-democratic theoretical perspective has been the thinking of Michel Foucault, and his historical excavation of the way in which power relations are interwoven with knowledge, discourse, social practices and material arrangements. For Foucault, power is ‘productive’ in that it normalises the kinds of conforming identities and modes of behaviour that are commensurate with dominant discourses (Castree 2005). He recognised, in other words, the existence of asymmetric relations of power which affect the ability of differentiated groups to enter social negotiations in an equitable way (Cooke and Kothari 2001, Flyvbjerg 2000, Richardson 2005). In this view, deliberative democratic framings pay insufficient attention to the notion that participation is constrained by, hides, and simultaneously perpetuates certain sets of power relations.

Foucault saw discourses as diffuse, anonymous, and constitutive of the phenomena they are often purported to represent. Power is thus not something that is wielded by institutions such as those of the state. Rather, it “emanates through them in a ‘capillary’ fashion as multiple discourses do their work on people’s minds and bodies” (Castree 2005: 147). In Foucault’s view, power/knowledge relations ‘produce’ subjects whose behaviour is discursively regulated and modified in line with given rationalities. In his study of the evolution of prisons in *Discipline and Punish*, he describes this mode of subjugation as ‘discipline’, through which actors are ‘made’ into objects and instruments of power. This disciplinary power is invoked within a range of techniques of hierarchical observation, normalising judgement and examination which Foucault refers to as the “micro-physics of power” (1977). In this way, the prison can be seen as an assemblage of practices and materials in which relations of power are organised in a hierarchical way.

Post-political theorists have thus turned to Foucault’s perspective on how social categories are ‘normalised’ and temporarily defined by certain discourses through the effects of power (Del Casino 2009). Foucault (1979) used the term “governmentality” to draw attention to the governmental

production and normalisation of certain types of citizen behaviours. This is apparent not in the form of direct coercion or repression, but in ensuring the “conduct of conduct” through a plurality of entities including the media, education, expert institutions and political authorities in arrangements of governance ‘beyond-the-state’ at sub-national, national and supranational scales. As well as EIA, active examples include urban development bodies, public-private partnerships, the European Union, and the World Trade Organization or G-20 meetings. This process is accompanied by the extension of the regulatory and interventionist powers of authorities through the inclusion of what Beck (1997) called “unauthorized actors.” Within these structures of institutional policy-making, administration and implementation the roles of science, technology and private economic actors are predominant (Murdoch 2005).

Since around the late 1990s, a number of academics have come to consider the deliberative modes of governance that predominate in these spaces as both responsible for and symptomatic of a weakening of the public sphere. Reflecting on what Lacoue-Labarthe *et al.* (1997) describe as ‘retreat of the political’, an emergent literature across the social sciences has conceptualised this deliberative democratic model as constitutive of ‘post-politics’, ‘post-democracy’ and ‘the post-political’ (see Brown 2005, Haughton *et al.* 2013, Mouffe 2005, Rosanvallon 2008, Swyngedouw 2005, Swyngedouw 2011, Swyngedouw and Williams 2016). The theoretical argument developed here centres on the difference between ‘the political’ on the one hand, and ‘politics’ on the other. Broadly speaking, it refers to a situation in which the former – understood as a space of power and contestation – is increasingly colonised by the latter – understood as the institutions and technologies of governing (Swyngedouw 2011). Depoliticisation thus entails the occupation of political space by a consensual mode of governance which, paradoxically, forecloses upon equality, oppositional critique and those who may attempt to assert them. In institutional terms, post-politics has also been said to be defined by the reduction of the political to the economic. This implies the creation of official consensual spaces which are also ‘welcoming business environments’ in which corporate agendas may be translated into public policy (Wilson and Swyngedouw 2014).

The key thinkers of the post-political share a ‘post-foundational’ ontology, which asserts the impossibility of a final ground, or an ultimate and essential destination, for democracy or the political. This implies an increased awareness of contingency and temporality, or as Marchart (2007: 2) puts it, “the political as the moment of partial and always, in the last instance, unsuccessful grounding.” Put another way, while ‘politics’ is the attempt to ground a particular set of power relations on an ultimately absent foundation, ‘the political’ is the “ineradicable presence of this absence itself, which continually undermines the social orders constructed upon it” (Wilson and

Swyngedouw 2014: 10). Critically for these interlocutors, it is this ineradicable ontological truth which holds open the possibility of radical change. The three key mediators of this theoretical turn have been Jacques Rancière, Slavoj Žižek and Chantal Mouffe, whose respective conceptualisations of the post-politics, democracy and the political tend to slip between two different positions: post-politics as a description of the exclusion or foreclosure of the political as class struggle; and post-politics as an ideal of consensus that must be rejected in light of its disavowal of antagonism and equality. While Žižek holds the former view, Mouffe and Rancière envisage versions of the latter (Dean 2014).

It is Mouffe, however, who takes aim directly at Third-Way politics and Habermasian deliberative democracy outlined earlier in this chapter, arguing that these approaches “negate the inherently conflictual nature of modern pluralism” (Mouffe 1999: 105). Drawing carefully upon Carl Schmidt’s critique of liberal parliamentarianism, for Mouffe ‘the political’ is “the dimension of antagonism [...] constitutive of human societies” (Mouffe 2005: 16-17), a we/they opposition which is the necessary condition of all political identities. This idea of antagonism asserts a negativity that is constitutive and that can never be overcome, it reveals the existence of conflicts for which there are no rational solution, in which the final reconciliation of all views is impossible. For Mouffe (2005), the forced blindness to antagonism is informed by an idealised belief in the “original innocence” (ibid: 2) of human beings, with violence and hostility seen as archaic and to be eliminated. She argues that total freedom and full democracy are not an achievable end state, and that the denial of conflict is a denial of politics itself. This also relates to Laclau and Mouffe’s post-foundational concept of hegemony, which characterises the practices of every kind of social order as the contingent articulations of power relations that lacks an ultimate final ground. They argue, however, that every hegemonic order is predicated on the exclusion of other possibilities and specific relations of power and that they can therefore be challenged and transformed.

By contrast to Mouffe, Rancière views the absent ground of the political as being defined not by antagonism, but by the unconditional equality of all beings. Rancière calls politics “the police” and refers to it as the meeting ground between politics and the political. It is the police which determines the “distribution of the sensible” – which is the systematic organisation and normalisation of inequality as common sense. This governmental order, he claims, “operates through the exclusion of a part of society that is given no part in society” (Wilson and Swyngedouw 2014: 12). For Rancière (2000: 124), genuine political moments are enacted by this excluded group – whom he calls the “part of no part” – and involve a claim of radical equality. He sees democracy as “the paradoxical power of those who do not count: the count of the ‘unaccounted for’.” It is

depoliticisation that makes it more difficult for people with no place in the existing social order to disrupt the distribution of the sensible.

Rancière asserts that such depoliticisation is achieved through three distinct mechanisms of disavowal: *archi-*, *meta-* and *para-politics*. '*Archi-politics*' describes the way in which the political is disavowed through assigning a position and role to every individual in the community. In so doing it seeks to represent them as a harmonious whole, with nothing left over, thus eliminating the grounds for claims of exclusion. The latter form is thus the denial of the existence of those who are excluded. '*Para-politics*' accepts that there are people who have no part in the existing political order, but it attempts to rid them of their disruptive potential by engaging them in meaningless arrangements of deliberative stakeholder engagement. Finally, '*meta-politics*' seeks the subordination of politics to market-based relations of competition. What Rancière terms '*post-democracy*' is thus a specific division of the sensible, in which these forms of disavowal are synthesised under the banner of '*consensus*' (Rancière 2004).

Rancière's understanding of the disavowal of 'the political' was developed by Žižek in his conceptualisation of the '*post-political*'. Rather than antagonism or equality, he contends, the void that represents 'the political' is a historically specific form of class struggle which is foreclosed upon. '*Post-politics*', for Žižek, is the '*foreclosure*' of dissensus and radical democratic intervention, with a managerial scientific form of governing. What *post-politics* tends to prevent, according to Žižek (1999: 204), is the "metaphoric universalisation of specific demands" through the mobilisation of vast apparatus of experts "to reduce the overall demand (complaint) of a particular group to just this demand, with its particular content." The political is thus displaced by "the collaboration of enlightened technocrats [where] via the process of negotiation of interests, a compromise is reached in the guise of a more or less universal consensus" (ibid: 236).

The ideas of Rancière have since been introduced to geography and spatial theory by Dikeç (2002, 2005), and applied to global climate change (Swyngedouw 2007, 2010, 2011), urban politics (Dikeç, 2002, Paddison 2009, Swyngedouw 2009, Oosterlynck and Swyngedouw 2010) and spatial planning (Allmendinger and Haughton 2012). For Erik Swyngedouw – another major contributor to this field – the *post-political* consensus is clearly visible in respect to climate change, in which the vast majority are in firm agreement on the solutions required. Within the *post-political* climate change discourse, he argues, matters of concern are "relegated to a terrain beyond dispute [...] that does not permit dissensus or disagreement. Scientific expertise becomes the foundation and guarantee for properly constituted politics/policies" (Swyngedouw, 2007: 27). Decisions are portrayed as politically neutral necessities in light of impending crises and existential threats. As they are largely dictated within

exclusionary spaces of expert-government and business interests, these decisions cannot be challenged through conventional democratic channels (Johnstone 2012).

Žižek (1999: 221) views such processes as anti-democratic, in which “the struggle for one’s voice to be heard and recognised as the voice of a legitimate partner” is replaced by a ‘consensus’ centred around non-accountable scientific expertise. The consequence of this process is said to be the emergence of an increasingly large gap between an elite mix of politicians, business leaders, think tanks, and associated expert advisers, on the one hand, and an increasingly apathetic and disempowered public on the other (Swyngedouw, 2011). As Swyngedouw (ibid: 371) states, a consensual mode of governance has reduced political conflict to:

para-political inclusion of different opinions on anything imaginable (as long as it does not question fundamentally the existing state of the neoliberal political-economic configuration) in arrangements of impotent participation and consensual ‘good’ techno-managerial governance.

Herein, it is argued that “political contradictions are reduced to policy problems to be managed by experts and legitimised through participatory processes in which the scope of possible outcomes is defined in advance” (Wilson and Swyngedouw 2014: 6). Thus while using the language of decentralised, democratic decision-making, participation can conversely be seen as allowing the neo-liberal capitalist consensus to continue. In such a view public participation is robbed of its truly deliberative and policy-shaping function and reduced solely to its legitimising function.

For Žižek and Rancière, the solution is a disruption of the police order, a revolutionary anti-capitalist politics, and the overthrow of liberal democracy. Conversely, Mouffe argues that the post-political repression of antagonism from the public sphere must be challenged from within liberal democracy to reanimate its radical core. This must be achieved by re-politicising the division between Left and Right. Her vision of ‘agonistic pluralism’ envisages the creation of a “vibrant public sphere of contestation” between plural collective identities; in which antagonism is sublimated by ‘agonism’ and political opponents regarded as legitimate adversaries, with whom “conflictual consensus[es]” can be achieved, rather than enemies to be destroyed (Mouffe 1999, Mouffe 2005). In this model, the goal of democratic politics is not the reconciliation of competing interests, but rather the recognition that the ‘agon’, or arena of political contest, must always be preserved institutionally, not glossed over as an embarrassing distraction from liberal consensus. In other words, the point of democracy should not be to sublimate the struggle of ideas or interests, but to ensure that it can always continue on an egalitarian footing. In such a system the political endpoint cannot be stabilisation of (class) interests, but the preservation of the agon, or possibility of dissensus, itself.

Critical planning theory has sought to reflect on the implications of the post-political condition and the possibilities for 'agonistic' approaches to democratising decisions (Haughton *et al.* 2013, Tewdwr-Jones and Allmendinger 1998). Such empirically grounded approaches have focussed on the extent to which post-politics is achieved in particular policy settings (Allmendinger and Haughton, 2012). Here, the focus is on how specific policies foreclose upon political space in certain settings. Placing an emphasis on the 'where' of politics in relation to particular policy landscapes and policy reforms, Allmendinger and Haughton (2012) use the notion of the 'displacement' to focus on how the locations and political methods utilised by different groups relate to particular planning policy approaches. Similarly, Cowell and Owens (2006) focus on the 'political opportunities' for activist groups in relation to public enquiries. Many other authors have questioned whether deliberative consensus is possible or even desirable in a world of increasing difference. They advocate a rediscovery of the conflictual dimension of decision-making suggests a radical move away from the normative focus of Habermas and towards a more political framing (see, for example, Flyvbjerg 1998, Huxley 2000, McGuirk 2001, Rydin 2003, Tewdwr-Jones and Allmendinger 1998).

Despite their common starting point, the three main post-political thinkers can be said, in summary, to have fomented a kind of theoretical stalemate. Žižek argues that Mouffe's form of radical democracy participates in the foreclosure of class struggle by limiting itself to "palliative damage-control measures within the global capitalist framework" (Wilson and Swyngedouw 2014). He also criticises Rancière for a commitment to spontaneous uprisings of the oppressed. By return, Rancière opposes the Žižek's advocacy for a re-politicisation of the economy by a return to orthodox Marxism, which he argues would maintain the political as subordinate to economic logics. Rather than antagonism in the abstract, both Žižek and Rancière affirm the political potential of class struggle and equality respectively, and therefore seek to ground their politics in the antagonistic moment that Mouffe seeks to negate through 'agonism'.

Yet it has been contended that there is a lack of engagement between such theories and the actually existing geographies of contestation across different sites and the generative processes of such contestation (Dean 2009, Featherstone and Korf 2012). Binary and reductive representations of the political to either consensual or antagonistic have been said to downplay the generative character of political activity (Barnett 2012, Dikeç 2012, Meyer *et al.* 2012). Some have insisted that thinking spatially is a productive way of challenging this dualism, drawing upon Doreen Massey's (Massey 2005) conceptualisation of space as a "dimension of multiplicity", which allows for both the consensual and the antagonistic to be co-emergent through the activity of political movements (Dikeç 2012, Featherstone 2008, Kothari 2012). In this way, rather than being primarily either

consensual or antagonistic, the political can be a space in which the views of multiple identifications are legitimised and can shape political action in diverse ways (Featherstone and Korf 2012).

However, the literature on situated accounts of the experience of politics in different historical and geographical contexts (see Geiser 2012, Schlichte 2012, Spencer 2012) is relatively nascent.

Jodi Dean (Dean 2009: 12) argues that the debate around post-politics not only overlooks the reality of politics on the ground, but also “cedes in advance key terrains of activism and struggle” by not recognising “politicized sites as politicized sites.” Therefore, the theoretical assertion that the consensual model necessarily contains what Laclau and Mouffe (1985: 2) described as a “surplus” or excess of antagonism which must be accounted for calls attention to the myriad emergent sites and subjects through which ‘returns’ of the political are manifested (Dikeç 2005, Swyngedouw 2011). It is these returns of the political, entailing new collectives, channels and sites of political action both inside and outside of the institutional setting, to which this thesis pays needed empirical attention. This relates to similar critiques stemming from Science and Technology Studies (STS), which emphasise the role that networked actors, ‘objects’, non-human ‘actants’ and issues of contention play in political contestation. Rather than starting from an overarching conceptualisation of the post-political, this thesis focusses on the empirical emergence of political contestation. As described in the following section, this leads to a focus on the ‘hot situations’ in which policy and the science that underpins it are contested, and to political ecologies of water, mining and power.

### 2.3. Spaces of heterogeneous association: *micro*-level ‘hot situations’ and political ecology

The post-foundational view of the political as having no ultimate destination corresponds strongly to Thomas Kuhn’s (1970) analysis of the procession of scientific paradigms, in which knowledge itself was shown to have no ‘final ground’. In the wake of Kuhn’s seminal critique, and Berger and Luckman’s (1966) pioneering treatise on the *social construction of reality*, two areas of study began to emerge in the scholarly agenda. Both of Science and Technology Studies (or STS, from which Actor Network Theory, or ANT, was born) and political ecology (PE) rejected the view that science obtains its power from accurate and objective observation of reality. Rather, the power of science was seen as lying in its ability to control and manipulate elements in ways that allow scientific facts and artefacts to be constructed and disseminated (Murdoch 2006). They called into question the existence of a purely rational, objective knowledge, arguing instead that knowledge arises from processes more related to ideology, interests, or power. And both disciplines, but most explicitly in political ecology, understood the scientific separation of the ‘natural’ from the ‘social’ as instrumental to justifying and maintaining the dominant capitalist order. As such, studies have

sought to show how socio-ecologies are represented and shaped through relations of political and economic power. They have done so using intensive, qualitative methods such as those employed for the research for this thesis (see Chapter 3), which focus on the micro-scale of “hot situations” (Callon 1998).

### 2.3.1. Science, technology and participation

Beyond normative concerns, the emphasis placed on bringing non-academic experts and the public into processes such as EIA is symptomatic of the recognition that what constitutes relevant knowledge is not constrained to the academy. Over the 1980s and 1990s, a number of scholars began to argue that the recognition of the social construction of knowledge means acknowledging that expertise is conferred upon individuals and organisations in many different circumstances. The deliberative, participatory turn has thus been seen as central to complex struggles over ‘what’ counts as relevant knowledge, ‘who’ its legitimate bearers are and ‘how’ should they be involved (Jasanoff 2003, Jasanoff 2004, Wynne 2003, Irwin 2006). In other words, such perspectives express the need to consider how knowledge-making, or the “co-production” of knowledge “fits into the wider functioning of society” (Jasanoff 2003a: 230).

Participation and co-production of knowledge have been favoured topics within STS literature. STS practitioners have interrogated the increasingly apparent relationship between science and policy, starting from a view of the modern liberal state as having historically relied upon scientific expertise as a supposedly objective basis for legitimate policy and decision-making (e.g. Irwin 1995, Jasanoff & Wynne 1998, Jasanoff 2005, Jasanoff 2012, O’Riordan *et al.* 1988, Wynne 1982). This postmodern approach to science holds that scientific facts do not necessarily reflect reality but are constructed or agreed upon by the experts (Jasanoff 1990). These scholars have thus questioned the functioning and claims of experts and the monopoly science holds as the exclusive provider of ‘truth’ (e.g. Irwin 1995, Wynne 1996). In her seminal book *The Fifth Branch*, Sheila Jasanoff (1990) pointed at the important, and largely unregulated, role of these experts and advisers as “boundary workers”, who occupy a poorly demarked territory between science and politics. In this conception, boundaries, boundary workers and boundary objects (e.g. concepts, definitions, models, standards) are permanently subject to new knowledge claims, renaming, re-establishing, redefining and blurring. The boundaries of science and politics are therefore socially constructed and contingent. Jasanoff (2011) highlighted how the legitimacy of conventional institutions, practices and discourses is contingent upon the prevailing social values and commitments of their citizens, and thus they respond to change over time. What she described as “constitutional moments” (*ibid.*) arise



following instances of relatively fast democratic change, when the basic rules of political practice are re-written, altering relations between the state, experts and citizens. Jasanoff (ibid) identifies two such moments as having occurred in the United States. Its pluralistic moment coincided with the emergence of NEPA, between 1940 and 1980, when the public sphere was enlarged to include new issues, viewpoints, and actors in regulatory decisions. From 1980 onward, however, the neoliberal moment has been characterised by a contraction of key parts of the state and a reversion to expert reasoning.

Highlighting these emergent objects and subjects, Callon (1998), Latour (2004) and Stengers (2005) each theorised the importance of knowledge controversies as arenas for challenging traditional scientific approaches to knowledge production. Callon refers to these moments as “hot situations”, which “indicate the absence of a stabilized knowledge base” and within which “everything becomes controversial” (Callon 1998: 11). This thesis argues that such situations, what Callon terms “overflows” (ibid) of that which cannot be contained by rationalist scientific and ethical framings, correspond to the limited democratic capacity of public participation in the NEPA process. Thus, as described in Chapter 6, what Laclau and Mouffe (1985: 2) theorise as a “surplus” of the political – as it relates to contested and disavowed socioecological, socioeconomic, cultural and ethical themes discussed in Chapters 4 and 5 - is rearticulated through wider networks of association. This perspective regards such controversies as “generative events in their potential to foster the disordering conditions in which reasoning is forced to slow down, creating opportunities to arouse ‘a different awareness of the problems and situations that mobilize us’” (Whatmore 2009: 588). Such theories have been notably explored and applied in relation river basin management (Lane *et al.* 2011, Whatmore and Landström 2011). This thesis similarly moves beyond an analysis of the enclosed institutional space of NEPA in order to consider how power circulates across scales and between sites of contestation and association on a more extensive basis (Murdoch 2005).

The political ecologies of water and mining reviewed in the following sub-section incorporate significant elements of the concern within STS for the importance of spatial relationships. Critically however, they also reflect the focus on the emergence of subjects, materialities and knowledge controversies as objects of situated empirical enquiry. Discussing the existing literature in political ecology in this respect, it concludes by returning to perspectives on the significance of the discursive means through which power is articulated in these complex socio-natural spatial relations.

### 2.3.2. Political ecologies of water and mining

The concern in STS for the way in which discourses are materialised in space relates strongly to the discipline of political ecology (PE), which emerged at the out of the same post-positivist moment in the 1970s. Political ecology thus also emphasises the politics of knowledge that is implicit in environmental governance and spatial relations (Escobar 1999, Bryant 2000, Castree 2005, Walker 2005) in which culture, society and values have been distanced from objective scientific enquiry. Conversely, they have emphasised the importance of 'local knowledge' and of local communities, both in implementing environmental management strategies and in the definition of the values and norms upon which they should be based (Escobar 1999, Brown and Purcell 2005). Political ecologists point to the material conditions that produce the human environment as being controlled and manipulated to serve the interests of elites at the expense of marginalised populations (Swyngedouw and Heynen 2003).

The term 'political ecology' was coined as a way to conceptualise the relations between society and nature, in particular focussing on questions of access and control over commodifiable resources (that is to say the rationale of political economy) (Peet and Watts 2004). Latour (2004) argues, however, that perspectives on the heterogeneous complexity of space should rethink the fundamental relationship between politics and ecology. For him, the aim of political ecology is not to root politics in nature but rather to "convoke a singular collective" (ibid: 29) made up of associations of human and non-human 'actants' that "exchange properties" (ibid: 61). Latour emphasises the congruence with STS, stating: "it was once thought that political ecology had to bring humans and nature together, whereas it actually has to bring together the scientific [technical] and political ways of intermingling humans and nonhumans" (ibid: 148). For Latour both water and mineral deposits are thus not inert objects of nature, but rather active participants, or 'actants' whose material and geo-ecological properties simultaneously shape and are shaped by social relations.

Research on the 'hydrosocial' cycle, for example, suggests a close correlation between transformations in the hydrological cycle at local, regional and global levels on the one hand and relations of social, political, economic, and cultural power on the other (Swyngedouw 2004). It envisions "the circulation of water as a combined physical and social process, a hybridized socionatural flow that fuses together nature and society in inseparable manners" (Swyngedouw 2006: 56). The hydrosocial is thus conceived as hybrid, a "complex network of pipes, water law, meters, quality standards, garden hoses, consumers, leaking taps, as well as rainfall, evaporation, and runoff" (Bakker 2002: 774). These 'actants' are bound together by dynamic circuits of knowledge, measurements, devices, organizations, institutional practices, and governance regimes and mediated by social relations of power (Linton and Budds 2014). Relations of social power,

therefore, are reproduced by and reflected in the physical characteristics of water and the complex networks by which it is distributed, regulated and governed.

Boelens *et al.* (2016: 2) conceptualise the ground on which these socio-natural networks of water play out as 'hydrosocial territories', which are "defined, aligned and mobilized through epistemological belief systems, political hierarchies and naturalizing discourses." These epistemological belief systems express the nature and scope of legitimate knowledge upon which decisions should be based. "Naturalizing discourses" combine these knowledge claims with power in order to determine social and material practices of water management (ibid: 2). In the words of Foucault, such projects aim to "governmentalize" or "conduct the conduct" of specific groups. To do so, they create a political order that makes these local spaces comprehensible, exploitable and controllable. While recognising local water users and granting concessions to participation, they seek to reframe their worldviews, needs, strategies and relationships, while simultaneously excluding alternatives and thus delimiting "the universe of further scientific inquiry, political discourse, and possible policy options" (Jasanoff and Wynne 1998: 5).

Research conducted over the past decade or so has explored how different efforts to reconfigure hydrosocial territory have envisioned very different ways of organising local environments, livelihoods, production and regional economic development. Examples include studies of water services privatisation (Bakker 2002, Hernández-Mora and Del Moral 2015, Loftus *et al.* 2016) and conflicts between agro-industry and conservation in Europe (Hulshof and Vos 2016). In South America, there has also work on the neoliberalisation of water supply (Ioris 2016, Palomino-Schalscha *et al.* 2016, Rodríguez-de-Francisco and Boelens 2016), resistance to state ordering of water rights (Hoogesteger *et al.* 2016, Perreault 2005), and efforts of social movements in opposing and re-democratising privatised sanitation services (Hoogesteger *et al.* 2016, Romano 2016). Meanwhile, perspectives from the United States have included the implications of private property water rights for irrigators in the west (Perramond 2016), and water pollution and marginalised communities (Perreault *et al.* 2012). In many of these writings, hydrosocial configurations are viewed as commonly enhancing local–global commodity transfers and resource extraction responding to non-local economic and political interests. They show how this has often led to the empowerment of certain groups at the expense of others, creating hydrosocial territories that are highly contested.

The rapid and aggressive expansion of the mining, oil and gas sectors, particularly in South America, began to attract the attention of a group of political ecologists as a problem that was urgent not only in social and environmental terms, but also analytically, lying at the core of the relationship between

development and democracy in the region (Bebbington 2012b). This resulted in a wave of contributions on the subject, many focussing on the often inequitable distribution of access to resources and exposure to social and environmental risks affecting local/indigenous communities that have arisen from the neoliberalisation of resource exploitation (Bury 2005, Emel and Huber 2008, Himley 2013, Hindery 2004, Li 2009, Szablowski 2002). Social movements and the emergence of conflicts across scales, between local groups, extractive corporations and the state, have been similarly highlighted (Bebbington 2012a, Bebbington and Bebbington 2010, Kaup 2008, Perreault 2008, Valdivia 2008, Zalik 2009), among a plethora of other writings (Bebbington and Bury 2013, Bridge and Frederiksen 2012, Haarstad 2012, Horowitz 2010, Huber 2009, Kaup 2008, Moore and Velásquez 2013, Tschakert 2009). In this literature, minerals and hydrocarbons have thus been viewed as “constitutive of the functioning of capitalism and when they are enrolled into social life, a wide range of political imaginaries and relationships are reworked” (Watts 2004, Perreault 2008, 2013 cited in (Bebbington 2012b).

While a number of authors have focussed on the convergence of the mineral cycle, or mining, and the hydrosocial cycle, in which extractive industries are embedded, the literature on this important nexus is relatively small. A large proportion of existing case studies are in South America, where regulatory failure by weak, inoperative or corrupt institutions has often left communities with little choice other than to organise and protest in order to protect their livelihoods, with varying effectiveness (Bebbington *et al.* 2010). Others have considered the ways in which hybrid ‘waterscapes’ are increasingly co-produced through mining in the region, such that water governance is reconfigured and rescaled to produce uneven socio-natural relations (Budds and Hinojosa 2012). As mining corporations use scientific models to create meanings for water that legitimise their appropriation of it (Beltrán and Velázquez 2017), subsequent transformations in the materiality of nature – water and sediment – have been shown to shape processes of dispossession through their accumulation (Perreault 2014). Thus, contrary to assertions that mining underwrites struggling local economies, outmigration to find employment, dispossession of lands, livelihoods, bodies and labour show that local people actually subsidise extractive industries, as well as broader capitalist economies (*ibid*). These socio-natural waterscapes have thus been conceptualised as “the ways in which flows of water, power and capital converge to produce” uneven socio-natural relations (Budds and Hinojosa 2012).

Gavin Bridge (2000: 224) has reflected on the materiality of mineral deposits and the environmental and social contradictions inherent in their extraction which “undermine the long term pre-conditions for accumulation” in the sector. Thus, through actively consuming mineral deposits and

simultaneously externalising significant environmental and social impacts, the globalisation and intensification of production in the mining sector creates a supply crisis and a legitimisation crisis for capital. Mirroring the broader neoliberal shift from government to governance, Bridge (1998) highlights the transition from state-administered environmental legislation to the increased role of corporations in 'regulating' these crises. This is achieved through a turn to discourses which socially construct the nature of production and consumption through what Beck (1992: 53) called "the assumptions, methods and controversies of external knowledge producers" which seek to stabilise perceptions of risk.

For Bridge, on one hand this 'discursive regulation' takes the form of the co-opting of environmentalist language in extensive public marketing efforts around technologically enchanted sustainability. On the other hand, at the local level, discursive narratives around cultural identity are appropriated and combined with pragmatist economic/anti-environmentalist sentiments. Huber and Emel (2009), meanwhile, point to the United States 1872 Mining Law to highlight the multi-scalar conduits for capital accumulation, which vie over the development of mineral deposits. These stand in stark contradiction to the 'fixity' of the latter and the local nature of the socioecological impacts of extraction. They emphasise that notwithstanding local discursive efforts, the failure to reform the 19th-century law has allowed for this scalar inequity. The implication is that discourse not only that discourse serves as a form of disciplinary power in that 'makes' subjectivities and materialities, but that discursive regulation also has a variable, ephemeral, partial and contradictory spatiality which opens up new opportunities for contestation (Bridge 1998).

#### 2.4. Water and mining in Southern Arizona

In this section, the issues surrounding case study for this research – the proposed Rosemont Copper Project – are contextualised, firstly in respect to the emergence of a hydraulic landscape in the southwest United States, through which scarce water resources were redirected toward productive activities. The extensive struggles that culminated in a legal-institutional framework, through which rights to water are today governed, are described. Secondly, the historical development of the mining industry, as one of those productive activities which spurred the expansion of the nation and the establishment of Arizona itself, is outlined.

##### 2.4.1. Water and the west

In 1845, New York journalist John O'Sullivan characterised the ambition to colonise the western North American continent as the fulfilment of America's 'manifest destiny'. The term expressed the belief that it was the Anglo-Saxon Americans' providential mission to expand his civilisation and

institutions across the breadth of North America. Anglo-Saxons had come to the Americas from a continent where periodic famines still stalked the peasantry, and where access to land, water, firewood and wild game was often controlled by aristocratic elites. Beyond mere territorial expansion, therefore, the 'American Dream' also consisted in the progress of liberty and individual economic opportunity (Howe 2007). In their preface to the 1882 Russian edition of the Communist Manifesto, Karl Marx and Friedrich Engels describe the United States as a pillar of the European capitalist system, with increasingly vast areas of land behind an advancing colonial frontier absorbing "the surplus proletarian forces of Europe through immigration [and] provid[ing] Europe with raw materials and [...] markets for the sale of its industrial products" (Marx and Engels 1848).

This ambition came to be symbolised within the constitutions of the newly confirmed states, whose existence depended upon the value of their resources and the industry of their populations. The state seal of Arizona, the design of which is enshrined in its constitution, symbolises the zeitgeist of American frontier economics:

In the background shall be a range of mountains, with the sun rising behind the peaks thereof, and at the right side of the range of mountains there shall be a storage reservoir and a dam, below which in the middle distance are irrigated fields and orchards reaching into the foreground, at the right of which are cattle grazing. To the left in the middle distance on a mountain side is a quartz mill in front of which and in the foreground is a miner standing with pick and shovel. Above this device shall be the motto: "*Ditat Deus.*" In a circular band surrounding the whole device shall be inscribed: "Great Seal of The State of Arizona", with the year of admission of the State into the Union.

(Arizona State Legislature 2015)

Depicted beneath the motto, on the state seal, are the five pillars upon which the economic prosperity of the state was to rest – the 'Five Cs'. Thus, *Cattle* are shown grazing in the pastures, beside *Citrus* growing in the orchards, with *Cotton* swaying in the fields. The blazing sun and blue skies of the Arizonan *Climate* ensure bountiful harvests. Meanwhile in the foreground, a miner, with pick and shovel signify the *Copper* in the mountain ranges. Perhaps it was its scarcity, as well as its spelling, which precluded water from its inclusion in the motto. However, the blue of the reservoir in this scene, with its promise of conquering the arid curse faced by so many pioneers, is a feature of another important article of state symbolism. On the Arizonan flag, beneath rays of Spanish red and yellow, superimposed upon which is a copper-coloured star, is the deep blue of the Colorado River (see Plate 2.1).



**Plate 2.1 – The state flag of Arizona (source: Pixabay) and Great Seal of Arizona, depicting the Five Cs - cattle, climate, cotton, citrus and copper**

The Colorado River rises in the Rocky Mountains of Colorado and flows generally west and south for 2,330 kilometres into the Gulf of California in north-western Mexico. Its drainage basin covers 637,000 square kilometres and includes parts of the U.S. states of Wyoming, Colorado, Utah, New Mexico, Nevada, Arizona, and California and the northern Mexican states of Sonora and Baja California. As well as the mountainous plateau in the north of the basin, the river drains a vast semi-arid sector of the North American continent and has for millennia been the life-blood for human inhabitants in the region. For centuries indigenous tribes hunted and farmed extensively in the Colorado basin. In the lower basin, the largest prehistoric canal irrigation system in the American west was built by the Hohokam on the Gila and Salt rivers (Reisner 1993, Serrat-Capdevila 2016, Sheridan 2012). In the wave of westward expansion by the liberated United States, Mormons settled the tributary valleys of the Colorado in Utah and Arizona from 1847 (Reisner 1993). The federal government sponsored major surveys of the river (most notably John Wesley Powell's expeditions in 1869 and 1871–72) and after 1900 began to focus on issues of river development: flood control, irrigation, hydropower, and water supply (see O'Neill *et al.* 2016, Poupeau *et al.* 2016, Serrat-Capdevila 2016).

By the late 1880's, most of the land of the southwestern United States in a climate conducive to agriculture (mainly in California) was already under cultivation. In arid states such as Arizona, however, the prohibitive cost and technical challenges of extensive irrigation quickly led to the collapse of the private irrigation companies which had been established to serve the industry. Failures of state-led irrigation projects eventually forced the federal government to intervene, passing the Reclamation Act of 1902 and forming the Reclamation Service (Reisner 1993).<sup>25</sup> Their

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<sup>25</sup> The Reclamation Service were later to become the Bureau of Reclamation, and continue to manage the Colorado River Basin system to this day.

immediate object was the Colorado River. Over the ensuing decades thousands of dams, canals, tunnels and other projects were built in the Colorado Basin, designed to re-lubricate the wheels of development and production in the region. Vast quantities of Colorado River water were thus ‘reclaimed’, diverted, channelled and pumped towards farms, ranches, factories, cities, and mines,

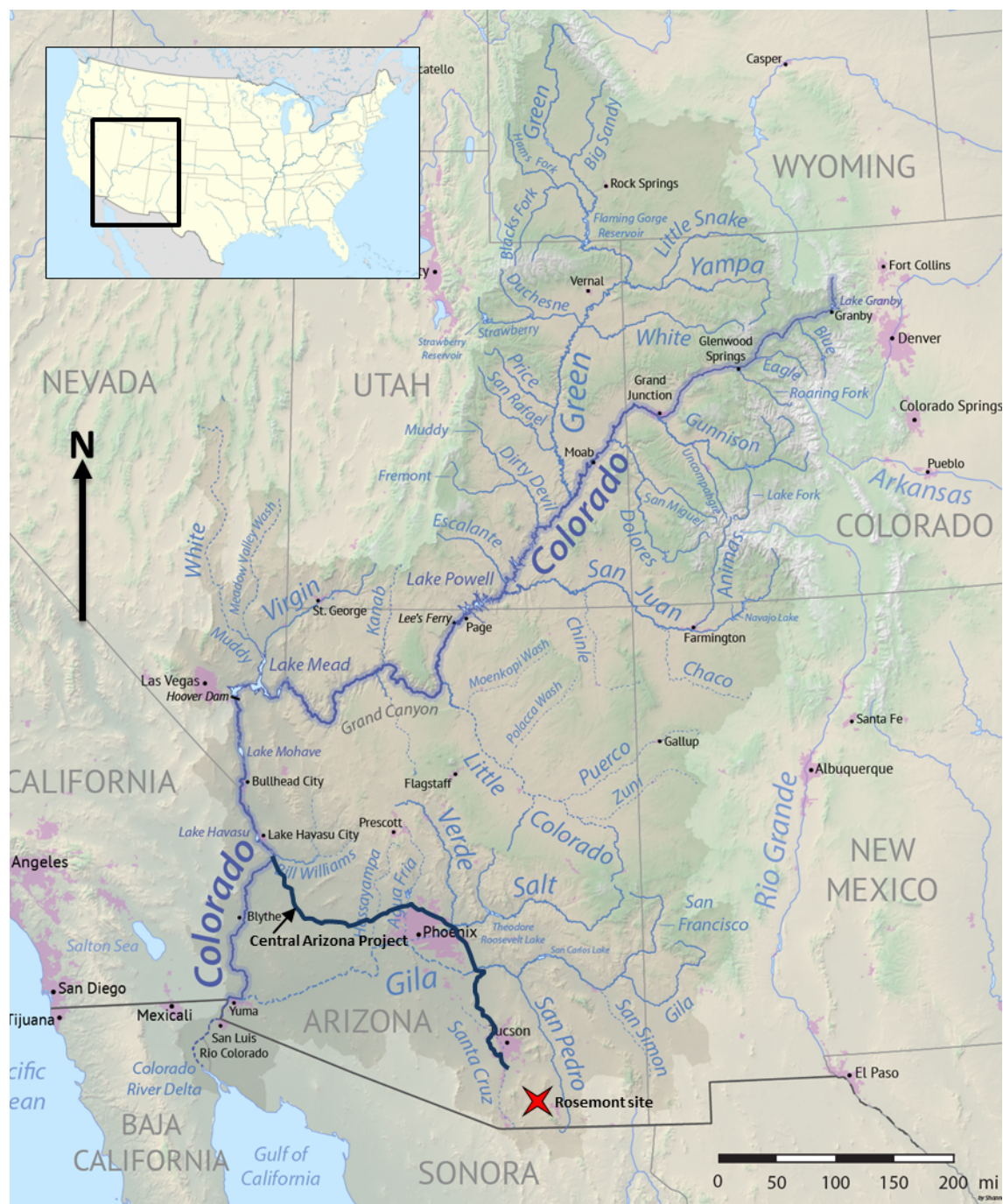


Figure 2.3 – The Colorado River: including the U.S. basin states of Colorado, Wyoming, Utah, New Mexico, Nevada, Arizona, California; and the Mexican states of Baja California and Sonora (Source: adapted from Colorado River basin map by Shannon1 licensed under CC BY 2.0)



while hydroelectric power was generated for the burgeoning urban areas (Burton 1991, Reisner 1993), with water rights sold according to the principle of ‘prior appropriation’.<sup>27</sup>

Starting with the 1922 Colorado River Compact, a complex legal framework emerged through which the waters of the Colorado River were regulated and apportioned between the ‘basin states’ (see Table 2.5). The Colorado River Compact effectively established equal water rights between the upper and lower basin states based on a total discharge of 15 million acre feet (m.a.f.) per year. Thus, 7.5 m.a.f. (9.25 cubic kilometres, or thirty Lake Windermere) per year were apportioned for the upper basin states of Wyoming, Colorado, Utah and New Mexico, with the remaining 7.5 m.a.f. awarded to the lower basin states of Arizona, Nevada, California, as well as Mexico. Later, the 1928 Boulder Canyon Project Act confirmed specific water allocations for each of the lower basin states<sup>28</sup> and approved the construction of the Boulder Canyon dam (later rechristened the Hoover Dam, completed 1936) forming Lake Mead which today provides water for Las Vegas (Patashnik 2013). However, the quantification of the River Colorado’s flows in absolute terms, rather than on a percentage basis, has proven significant as it has become apparent that the figures were based on a period of abnormally high flows in the Colorado (O’Neill *et al.* 2016).

Following numerous failed legal battles in which it argued for a greater apportionment, Arizona grudgingly ratified the Boulder Canyon Project Act and the various other agreements in 1944. However, having contracted the federal government for delivery of Colorado River water, the state faced one fundamental problem, there was no way to get the water from the river to its major urban centres in Phoenix and Tucson and the agricultural areas in the Salt and Gila River valleys. Lacking the capital to build a canal on its own, in 1951 Arizona senators Carl Hayden and Ernest McFarland successfully lobbied for a federally financed water infrastructure system for Arizona, which would eventually become the Central Arizona Project (CAP). In 1963 Arizona successfully argued in a Supreme Court case against California that the provisions of the Boulder Canyon Project Act were

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<sup>27</sup> A system for allocating water among landowners, the legal doctrine of prior appropriation established a strict hierarchy of water rights, based on the chronological order in which users first began to abstract water from a given source. These rights are limited to a specific amount of water, dedicated to an approved “beneficial use.” In times of shortage, the rights of users are honoured according to their seniority. This means that junior right holders do not receive their allocation until senior rights are met (Burton 1991, Donohew 2009). Due to the relative scarcity of water in the west, the prior appropriation doctrine diverged from the riparian rights doctrine which had been established since the colonisation of the eastern seaboard. With more than enough water to go around, the riparian system in the humid east provided for “reasonable use” of in-stream flows, on condition that downstream users were not adversely affected. This right is inherited in title to riparian land (Burton 1991).

<sup>28</sup> The upper basin’s allocation was later apportioned to each of its states by the Upper Colorado River Basin Compact of 1948 (see Table 2.5.).

**Table 2.5– Main components of the Law of the River relating to the waters of the Colorado River. From: (United States Bureau of Reclamation 2008).**

Legislation	Summary	Institution/Project (if applicable)
Colorado River Compact 1922	Allocated the waters of the Colorado River between the upper and lower basin states, 7.5 million acre-feet (m.a.f.) respectively.	
Boulder Canyon Project Act 1928	Apportioned the lower basin's allocation between California, Arizona and Utah to 4.4, 2.8 and 0.3 m.a.f. respectively (see Fig. 1).	Authorized construction of the Hoover Dam, Imperial Dam and All American Canal.
California Limitation Act 1929	Restricted California's share of the lower basin allocation to 4.4 m.a.f.	
California Seven Party Agreement 1931	Allocated annual Colorado River water entitlements to seven principal claimants...	Palo Verde Irrigation District, Yuma Project, Imperial Irrigation District, Coachella Valley Irrigation District, Metropolitan Water District, and the City and County of San Diego.
Mexican Water Treaty 1944	Committed 1.5 m.a.f. of the river's annual flow to Mexico	
Upper Colorado River Basin Compact 1948	Apportioned the upper basin's 7.5 m.a.f. among Colorado, New Mexico, Utah, Wyoming and the portion of Arizona that lies within the upper basin (see Fig. 1).	Upper Colorado River Commission
Colorado River Storage Project Act 1956	Provided a water resource development plan for the upper basin.	Authorized the construction of Glen Canyon, Flaming Gorge, Navajo and Curecanti dams, as well as several projects for irrigation and other uses.
<i>Arizona vs. California</i> 1964	Arizona successfully argued that the provisions of the Boulder Canyon Project Act were formally and legally binding in terms of water allocation.	
The Colorado River Basin Project Act 1968	Authorized construction of the Central Arizona Project (CAP).	CAP
Minute 242 of the International Boundary and Water Commission, United States and Mexico 1973	Required the U.S. to take actions to reduce the salinity of water being delivered to Mexico at Morelos Dam.	
Colorado River Basin Salinity Control Act 1974 (amended 1984, 1995 & 1996)	Authorized desalting and salinity control projects.	Yuma Desalting Plant

formally and legally binding in terms of water allocation, thereby neutralising California's opposition to the CAP. In 1968, Congress passed the Colorado River Basin Project Act, which finally authorized construction of the project, albeit with one concession to California: in the event of shortage, the sunshine state's 4.4 million-acre-foot allotment would be senior to all other rights to the river (Patashnik 2013).

Congress appropriated \$1.5 billion to build the CAP in 1971, but those funds were impounded until Arizona could propose a feasible repayment plan (Sheridan 1995). With the completion of the project decades away, state legislators in Arizona meanwhile laboured to find a solution to increasing problems associated with severe groundwater overdraft in the south of the state. Up to that point, Arizona's groundwater was governed by the doctrine "reasonable use"<sup>29</sup>. Under this system, provided that a landowner withdraws groundwater in order to make reasonable use of the property, neighbouring landowners have no claim for damages even if the groundwater withdrawals adversely affect water levels under the neighbour's property (Glennon and Pearce 2007, Staudenmaier 2007). Under this rule, productive agricultural areas developed that were largely or entirely dependent on groundwater. However, by the 1970s, the agricultural areas of Pinal County – between the cities of Phoenix and Tucson – were experiencing land subsidence and earth fissuring due to over-pumping for irrigation (Pitzer *et al.* 2007).

For four decades, unsuccessful attempts had been made to regulate groundwater pumping more stringently. A breakthrough occurred in 1976, when the Arizona Supreme Court ruled on *Farmers Investment Co. v. Bettwy*. Farmers Investment Company (FICO), which owns a pecan farming operation to the south of Tucson<sup>30</sup>, appealed that their water source was threatened by the pumping of groundwater by several mining companies and the city of Tucson. The court imposed a strict interpretation of a limitation to the reasonable use rule applied in a 1953 Arizona Supreme Court case. This required that that withdrawals of groundwater must benefit the property from which it is withdrawn (Staudenmaier 2007). Issuing injunctions against the defendants, the court held that "[w]ater may not be pumped from one parcel and transported to another just because both overlie the common source of supply if the plaintiff's lands or wells upon his lands thereby suffer injury or damage" (ibid: 326)

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<sup>29</sup> Groundwater/surface water separation

<sup>30</sup> It is perhaps not coincidental that FICO subsequently became a key actor in the case study chosen for this research, central to which (as described in Part II of this thesis) are competing interests in the allocation of scarce water resources between mining and other uses in the Tucson region.

Because the court's decision threatened to disrupt both economically important mining operations in the state and municipal deliveries of water to thousands of residential and commercial water users, the FICO ruling created significant controversy. The cities and the mining companies demanded relief from the Legislature (Staudenmaier 2007). Soon after, a 25-member groundwater commission was formed to write a new groundwater law. For three years the opposing interests between municipal, agricultural and mining interests proved irreconcilable. The deadlock was broken by an interjection brokered by Arizona Governor Bruce Babbitt, who convinced the U.S. Department of the Interior (DOI) to issue an ultimatum: unless Arizona enacted tough groundwater laws, the construction of the CAP would be halted. Babbitt reconvened the negotiations as mediator, and on 12<sup>th</sup> June 1980, the *Groundwater Management Act* (GMA) was signed.

For the first time, all responsibilities for water planning and regulation (except water quality), were centralised in one state agency, the Arizona Department of Water Resources (ADWR). The Act designated four parts of the state where groundwater pumping was greatest as Active Management Areas (AMAs) – including one around the city of Tucson. More stringent laws and regulations were applied in the AMAs, including the requirement to demonstrate an 'Assured Water Supply' (AWS), meaning that a developer must secure physical, legal, and continuous access to a 100-year supply of water (ADWR 2013, Staudenmaier 2007). However, one of the compromises brokered in order to bring the GMA about was that it explicitly exempted mining operations from these restrictions (Sheridan 1995). As discussed in the following chapters, this concession would become significant in relation to the proposed Rosemont project, effectively foreclosing upon arguments against the use of otherwise protected and increasingly threatened groundwater resources.

Nevertheless, with the DOI's ultimatum satisfied, Arizona could proceed with legislation which would allow the construction of the CAP to proceed. The legislature created the Central Arizona Water Conservancy District (CAWCD), which was given the power to levy a property tax to repay the costs of constructing the CAP, with three irrigation districts bearing the cost of building the spurs that would deliver CAP water to individual fields (Sheridan 1995). In 1993, the CAP, a 542-kilometre system of aqueducts, tunnels and pipelines from Lake Havasu to Phoenix and on to its present terminus south of Tucson (see Figure 2.3), was completed at a cost of \$4 billion, the largest and most expensive such project ever constructed in the United States (Pitzer *et al.* 2007).<sup>31</sup>

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<sup>31</sup> After using CAP water for just one year, however, the city of Tucson decided in the autumn of 1993 to discontinue the delivery of CAP water to residential customers due to widespread complaints of poor water quality. Piped directly into the municipal network, it emerged that the CAP water had a different mineral mixture from the aquifer water, dislodging and stirring up rust in city's water mains and house pipes. Faced

Today, however, water supply in central and southern Arizona is faced with a fundamental problem which, partly rooted in the failure to consider changes to the flow of the Colorado River in the 1922 Colorado River Compact. As of April 2015, the river, from which CAP water is drawn, was in its sixteenth consecutive year of drought, driven largely by the depletion of snowpack in its Rocky Mountain headwaters. While officials have often been reluctant to officially acknowledge a crisis, the Bureau of Reclamation (BOR) – the federal agency responsible for managing the Colorado River Basin – recently acknowledged the 39% likelihood of a shortage declaration for the lower Colorado River basin by 2022 (USBR 2017). While this short-term probability has reduced in comparison to recent annual assessments due to more favourable precipitation in over the winter of 2016-2017, there is a longer-term trend towards a shortfall of supply versus demand. Indeed, in a 2012 report, the BOR warned of an imbalance of 3.2 million acre feet (the equivalent of nearly 4 billion cubic metres, serving up to 40 million people) by 2069 (USBR 2012).

The BOR determine a shortage declaration primarily by the elevation of the water in Lake Mead, which is forecast each month for the following two years. If the elevation for a given January is predicted by forecast on the preceding August to fall below an elevation of 1075 feet, a ‘tier-1’ shortage is declared for the following year. In this eventuality, Arizona, as a ‘junior’ right-holding state under the 1922 Colorado River Compact, would receive a reduction to its allotment of 11% (ADWR 2015). If further projected elevations fall below thresholds of 1050 feet or 1025 feet, ‘tier-2’ and ‘tier-3’ shortage declarations would respectively see reductions to Arizona by 14% and 17% of their 2.8 m.a.f. water allocation. Meanwhile California, as the most ‘senior’ water rights holder, would not be legally obligated to reduce its Colorado River entitlement until such a point at which all of the other basin state’s allocations were exhausted (Pitzer *et al.* 2007).

A tier-1 shortage declaration would not impact water supplies to cities, towns, industries, mines or tribes in Arizona. It would, however, eliminate CAP water supplies to the Arizona Water Banking Authority, which has been developing long-term storage credits of unused Colorado River water since 1996. It would also reduce a portion of the CAP water supply identified for groundwater replenishment, which would impact agricultural water users and may cause an increase in CAP water rates. With increasing competition for water among users throughout the lower Colorado River basin states, questions inevitably arise over the priorities for allocation of water between

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with public outcry, the city decided to switch to a system of indirect supply. Using EPA funding, groundwater recharge facilities were constructed to receive a significant portion of Tucson’s CAP allotment. Once blended with the groundwater, the water was then pumped back into the network, thus resolving the water quality issue, albeit at great expense. As discussed in Part II of this thesis, however, this experience continues to influence public perceptions of water and the competing demands for it.

commercial uses such as agriculture and mining. In respect to these two industries, arguments have centred over the respective economic and cultural value of their contributions to Arizonan society. Such conflicts are central to the empirical research conducted for this thesis.

#### 2.4.2. Mining and southern Arizona

This thesis takes the case of a planned open-cast copper mining operation near the city of Tucson in southern Arizona, United States – the Rosemont Copper Project – as an example of the way in which schemes to appropriate and commodify mineral resources are inserted into hydrosocial configurations. The empirical case selected offers the opportunity for a perspective on the democratic means through which competing interests are mediated by institutions of governance. The case is of particular pertinence due to the convergence of a number of factors. A long regional history of mineral exploitation by corporate capital is juxtaposed against increasing contemporary concerns over water scarcity and the socio-environmental impacts of mining. The resultant level of contestation and engagement in the case over a considerable period provided considerable scope for an empirical analysis centred on the NEPA public involvement process.

Mining was one of the historic economic pillars for the settlement of the west, and, as the industry has continued to generate revenue and employment for the state of Arizona, its interests have held influence over policy in the region. This earliest and most direct example of this was the passing of the 1872 *General Mining Act* (GMA), which was intended to incentivise mining in the western United States during a time when the industry was largely comprised of independent prospectors. While in the 18<sup>th</sup> century Congress required a third of the profits from hard rock mines on federal lands to go to the Treasury, the 1872 law required no royalty be paid into the federal coffers. Thus, backed by eastern capital and propelled by the industrial revolution, an archipelago of public lands in the west was opened up to the productive activity of mining. Just as through farming and ranching before, this process was central to the “progressive ‘taming’ of the wild, western, ‘frontier’ by self-reliant, entrepreneurial, individual producers” (Huber and Emel 2009: 376).

Within four years of the 1872 Act, prospectors had recorded 11,605 claims in Arizona. Rapid declines in the richness of available ore bodies were mitigated by deepening economies of scale brought about by the emergence of new mining technologies such as the steam shovel, improved refining processes, the advent of open-cast mining, and steam railway freighting. In 1910 Arizona overtook Montana as the largest producer of copper in the United States and 25% of its population were ore miners (Sheridan 2012). The community of Bisbee developed around some of the richest discoveries in the Mule Mountains close to the Mexican border. Bisbee led the way for the copper industry in

Arizona, becoming one of the leading producers in the world, and founding a corporate empire which dominated Arizona politics until World War II. Following pre-war declines, from the 1950s, the copper mining industry experienced a double process of concentration and diversification. With improvements in the knowledge of hydrothermal processes involved in ore formation, new mines were opened in Southern Arizona (Briggs 2014). By the 1960s and 1970s, six companies (Anaconda, Phelps Dodge, Kennecott, ASARCO, Newmont and AMAW) represented 72% of US production (Hyde 1998).

Between 1960 and 1974, as overall US production and employment declined drastically, the value of Arizona's mineral production rose from \$320 million to more than \$1.5 billion, 85% to 90% of which came from copper. By 1974 the state's mines and smelters employed close to twenty-nine thousand people and were contributing around 60% of the nation's copper (Sheridan 2012). But the boom proved to be short-lived. Profit margins were beginning to be eroded by rising costs for extracting copper ore. Existing technologies were unable to provide sufficient productivity to counter the increasing scarcity of high-grade ore and the higher costs of extracting copper from the poorer bodies which remained. With increasing competition from overseas and plunging prices, the industry drove into a supply crisis. Between the spring of 1981 and the summer of 1983, 28 copper mines in the United States closed or scaled down production (Bridge 2000). During this period, from a peak production of 1.1 tons, annual output dropped to 747,604 tons. By 1989 the number of people employed in copper mining had dropped by two-thirds to below ten thousand, devastating communities like Douglas, Ajo, Bisbee and Clifton-Morenci (Sheridan 2012).

Nevertheless, today Arizona still has the richest copper deposits in the United States, and is second only to Chile, Peru and China in global copper production (USGS 2015). The exploitation of Arizona's mineral resources remains an attractive prospect for global mining companies. To the south of the city of Tucson, for example, the Mission mine (opened by ASARCO in 1951) and the Sierrita mine (Freeport McMoran, 1955) are today among the largest and most productive in the state, together producing 132,000 metric tonnes of copper in 2012. Yet both of these mines are located within the boundaries of the Tucson Active Management Area (AMA, one of five groundwater conservation districts established by the 1980 *Groundwater Management Act* – introduced earlier in this chapter). In 2008, the Mission mine pumped 15.53 million cubic metres (mcm) of water from the upper Santa Cruz aquifer. In the same year, the Sierrita mine pumped groundwater totalling 33.53 mcm.

Past mining operations in Arizona have long been associated with negative environmental impacts on the environment, both during mining operations and post-mining, to which water has been a central medium. Failure to capture and treat mine seepage and accidental contaminant releases,

including tailings spills or impoundment failures, have resulted in a variety of adverse effects, particularly in respect to water quality (Andrew Marcus 1987, Graf *et al.* 1991, Rösner 1998, Young and Clark 1978). These have included the contamination of drinking water aquifers, contamination and loss of fish and wildlife and their habitat, and risks to public health. In some cases, water quality impacts have been so severe that acid mine drainage is likely to generate water pollution in perpetuity (Earthworks 2013, Earthworks 2015).

While there have since been numerous amendments, the GMA still provides for the duty-free extraction of all hard rock or metallic minerals (i.e. gold, silver, and copper) on public lands in the United States, stating that both the minerals and the land “shall be free and open to exploration and purchase.”<sup>32</sup> Until recently, corporations could purchase public lands for a nominal fee (between US\$2.50 and \$5.00 per acre) through a process called ‘patenting’. However, following a number of controversies – in which the sale of large tracts of public land were revealed to have cost the taxpayer billions of dollars – a Congress-imposed moratorium has required the federal government not to accept any new applications for mining claim patents as of 1<sup>st</sup> October 1994 (Huber and Emel 2009). Nevertheless, the 1872 law presently applies to the over 1.1 million square kilometres of federal land and, where there are pre-existing patents, thus establishes mining as a preferred land use unless otherwise ordained.

The most significant amendment to the 1872 Mining Law was the *Federal Land Policy and Management Act* of 1976, which restricts unnecessary or undue degradation of the public lands upon which such actions are proposed.<sup>33</sup> This act effectively replaces many of the 1872 law’s provisions and requires reclamation of the mine site, financial guarantees for reclamation to the Federal government, mining claim occupation permits, and detailed ‘mine plan of operations’ (MPO) to be submitted to the responsible agency or agencies (those primarily responsible for governing the land in question) before disturbing the surface. It is this submission of a MPO to a federal agency which triggers the NEPA decision-making process (CEQ 2007a). However, as this thesis explores empirically, the imperative to comply with the GMA creates tension between the roles of Forest Service as steward of public land as both an environmental and economic resource, exposing fundamental contradictions between federal mining and environmental laws.

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<sup>32</sup> 30 U.S. Code § 22

<sup>33</sup> 43 U.S. Code § 1744



## 2.5. Conclusion

This chapter identified three main bodies of academic research relating to the three levels of enquiry identified in the aims of this research in Chapter 1. Section 2.1 described the emergence of the participatory principle as a democratic ideal and its widespread adoption in governance and environmental governance particularly. The research conducted for this thesis was situated in relation to *meso*-level perspectives on the policy and practice of public participation in environmental governance, including EIA and NEPA specifically. This section outlined the emergence of critical accounts of the theory and implementation of participation. These perspectives have hinted at the democratic limitations of ‘information sharing’ and ‘public education models’ of engagement (see Arnstein 1969, Callon 1999). In relation to EIA and NEPA it was pointed out that little empirical attention has been paid to the outcomes of such processes, with the majority of accounts foregrounding the experience of practitioners in respect to the processes of public engagement. In particular, none have considered the depoliticising effect of the framing of these participatory spaces, through an analysis of the extent to which different types of opinion from various types of participant are translated into substantive influence upon decision-making. As outlined in Chapter 1, this thesis aims to make such a contribution by addressing RQ1 and RQ2.

In Section 2.2, an important gap in the literature was identified in respect to the macro-level, namely, a post-democratic theoretical perspective on public engagement in the NEPA impact assessment process. The existing literature on the post-political and post-democratic was introduced in relation to its post-structuralist origins, which, since Foucault, have viewed the hegemonic organisation of cultural, political and economic life in terms of a shift from government to governance. The growing body of theoretical literature which considers this shift to have manifested the disavowal of antagonistic views through consensual, deliberative, participatory arrangements were introduced. Such a framing is representative of a fundamental misunderstanding of the nature of human relations, constituting a suturing of ‘the political’, and the de-politicisation and exclusion of oppositional critique from the neoliberal capitalist project. It was argued, however, that abstract-declarative condemnations of political practice as manifestations of the post-political consensus must be empirically substantiated, or else risk adopting intellectual positions which are at odds with everyday politics and practice (Sultana and Loftus 2012). This thesis thus builds on the relatively nascent literature in this respect, to consider – in response to RQ4 - how the chosen case study speaks back to theories of the political and the democratic.

In Section 2.3, it was argued that the concept of a surplus antagonism (or an overflow of the democratic) calls for a focus on the *micro*-level sites, subjects and objects in which can be seen a

'return of the political'. This thesis thus draws upon Actor Network Theory's emphasis on the materialisation of power/knowledge relations through networks and multiple spaces beyond the institutional setting. In particular, it foregrounds knowledge controversies and 'hot situations' as important objects of empirical enquiry, within which matters of concern may be de-politicised and/or re-politicised. Contributions from the field of political ecology to such a frame of analysis, particularly in relation to water and mineral resource extraction, were then reviewed. Adopting a similar focus on the subjects and objects of controversies, this thesis emphasises the flows and qualities water which mediate – and are mediated by – the material ecological and social impacts of mining.

These and other PE studies have employed ethnographic techniques to shed light on the discursive means through which power/knowledge is articulated and resisted through complex socio-natural spatial relations. In this thesis, they frame approaches to RQ3 set out in Chapter 3. While political ecologists have often examined the imposition of capital projects upon marginalised local communities in the global south, this thesis contends that considerable scope exists for such a contribution on the democratisation of environmental decision-making in a North American context. Moreover, contributions to theories of the post-political are rare in PE (Celata and Sanna 2012, Swyngedouw and Williams 2016). Similarly, while there has been some consideration of the concerns of post-politics in relation to water resource management (Swyngedouw 2013), few have considered the 'nexus' of water use and mineral extraction within specific geographic and historical contexts.

Finally, Section 2.4 provided an overview of the specific historical and geographical context within which the chosen case study for this research, the proposed Rosemont Copper Project (see Chapter 3, Section 3.1) is situated, and in which many of the themes discussed in the following chapters can be said to be rooted. It described the development of a hydraulic, extractive landscape in the southwestern United States, alongside which have emerged cultural values in relation to the mining industry, water scarcity, and the environment, which have become ingrained in the identity of many inhabitants of the region. The chapter also illustrated the emergence of a complex legal-institutional framework from a history of political struggles – between the government, states, industry and citizens – over access to water and mineral resources. The growing challenge of climate change and drought in the Colorado River Basin and the potential implications for southern Arizona frame much of the discourse in relation to future development in the region. Meanwhile, the region's historical experience with the adverse environmental impacts of mining pose significant questions over the legitimacy of the industry in increasingly water-scarce regions. However, the enactment of the 1872

mining law is introduced as a key moment in asserting the primacy of this particular activity on public land, with long-lived implications that apply to the Rosemont case. As becomes clear in this thesis, ambiguity and tensions between these laws and institutional functions and those enacted to protect the environment are transposed into the NEPA EIS process.

# **3. Researching contested spaces of environmental governance: methodology**

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In this chapter, I describe the methodology used to answer the research questions posed by this thesis. The selection of the case study – the NEPA EIS process for the proposed Rosemont Copper Project, in southern Arizona, United States – is discussed in Section 3.1. The background to the specific case of proposed Rosemont Copper Project is briefly outlined, focussing on the history of the Helvetia-Rosemont mining district, the procession of mineral rights holders, and the emergence of concerted opposition effort to the development of a mine in the area. The Rosemont Copper Project is described in more detail, including the physical and social geographical setting, and the plan of operations. This is followed by a chronological summary of the proceeding EIS and public engagement process mandated under NEPA, which is the major empirical reference point for this thesis.

Section 3.2 outlines the epistemological position for the research. The methodology is broadly informed by a critical realist framework, incorporating a mixture of ‘intensive’ and ‘extensive’ data collection techniques and thematic analysis. The main data sources are: in-depth interviews with 25 key informants; and a Thematic-Spatial Analysis of the public comments on the ‘Draft EIS’ produced by the United States Forest Service, followed by an analysis of the subsequent institutional response to those comments. The overall research design, relating data sources to methods of data collection and analysis, and the research questions, is described in Section 3.3. Sections 3.4 to 3.6 describe the methods of data collection and analysis. Before concluding, in sections 3.7 and 3.8 I reflect on the research process, addressing issues of positionality and ethics.

### 3.1.1. The proposed Rosemont Copper Project – plan of operations and surrounding environment

Rosemont Copper’s MPO proposed the use of 403 hectares of privately-owned land, and 1,485 hectares of the CNF land in the Santa Rita Mountains. The proposed open-cast mine pit would extend up to 1,980 metres in diameter, with a final depth of between 550 and 880 metres from the rim. In addition, the plans include an ore processing plant, waste disposal facilities, access roads and utility corridors. The waste rock storage (or tailings) facility, by far the largest aspect of the mine operation, would extend to eight kilometres from the mine pit. In total, the MPO implicated the disturbance of 2,198 hectares of public and privately-owned land for the proposed mining operations. The mine’s life-span, including construction, operation, reclamation and closure, was projected to be between 25 and 30 years, in which time approximately 500 million tonnes of ore and 1,170 million tonnes of waste rock would be extracted, which would be deposited across a large area of land adjacent to the mine pit on National Forest land (See Figure 3.1). An estimated total of 2.7

million tonnes of copper, 88 thousand tonnes of molybdenum<sup>38</sup>, and 2,300 tonnes of silver would be produced.

The operation would require approximately 6.17 million cubic metres of fresh water per year, pumped from wells located on land owned or leased by Rosemont Copper near the community of Sahuarita, in the Santa Cruz Valley (to the west of the Santa Rita range – see figures 3.1 and 3.2).<sup>39</sup> Most of the water required for the mine operation would be allocated to copper processing, which includes its use in flotation tanks – through which the mineral is separated from the ore. Smaller amounts employed for activities such as dust control, fire protection, drinking water, and sanitary uses. The upper Santa Cruz Aquifer, from which the water would be drawn, is part of the Tucson Active Management Area designated by the GMA (Serrat-Capdevila 2016). The aquifer, the sole source of municipal and commercial water supply for the Tucson area, is supplemented by Colorado River water from the CAP canal. The last terminus of the canal is a groundwater recharge facility near Sahuarita. Existing wells in the area are employed to withdraw water for municipal use for the communities of Sahuarita and Green Valley. They also supply a large pecan-farming operation in the valley, and two existing large copper mines.

The region has a semi-arid climate with bi-modal rainfall patterns which bring seasonal rainfall in winter and summer. Summer maximum temperatures exceed 40 °C and drop in the winter months to around 21 °C. In addition to the drought in the Colorado River Basin and the threats to Tucson's CAP supply, this part of Arizona has itself experienced prolonged water scarcity, with 2009 being the last year that no part of the state was classified as being in 'severe drought' (Serrat-Capdevila 2016). Yet the region's 'basin and range' topography provides a variety of microclimates and habitats, from alpine forests at the mountain tops (known locally as 'sky islands'), to mesquite grasslands and saguaro cactus forests and desert at lower elevations. This topography was created by faulting and uplift 12 to 6 million years ago during the Miocene, resulting in a sequence of ranges (Horsts) and tectonic depressions (Graven). Over millions of years, the depressions have been progressively filled with sediments eroded from the mountain ranges along the basin boundaries (ibid).

The Cienega Creek watershed, within which the mine would be sited, forms a large alluvial fan which dominates the geomorphology of the Tucson basin, fed by smaller alluvial fans over the rock pediment at the base of the Catalina Mountains to the north, the Rincon Mountains to the east and the Santa Rita Mountains to the south (Serrat-Capdevila 2016). There are two groundwater systems

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<sup>38</sup> Used to make types of steel alloy.

<sup>39</sup> 6.17 million cubic metres is equivalent to the volume of 2,468 Olympic-sized swimming pools, or just in excess of the volume of water discharged on average by the River Thames in a single day.

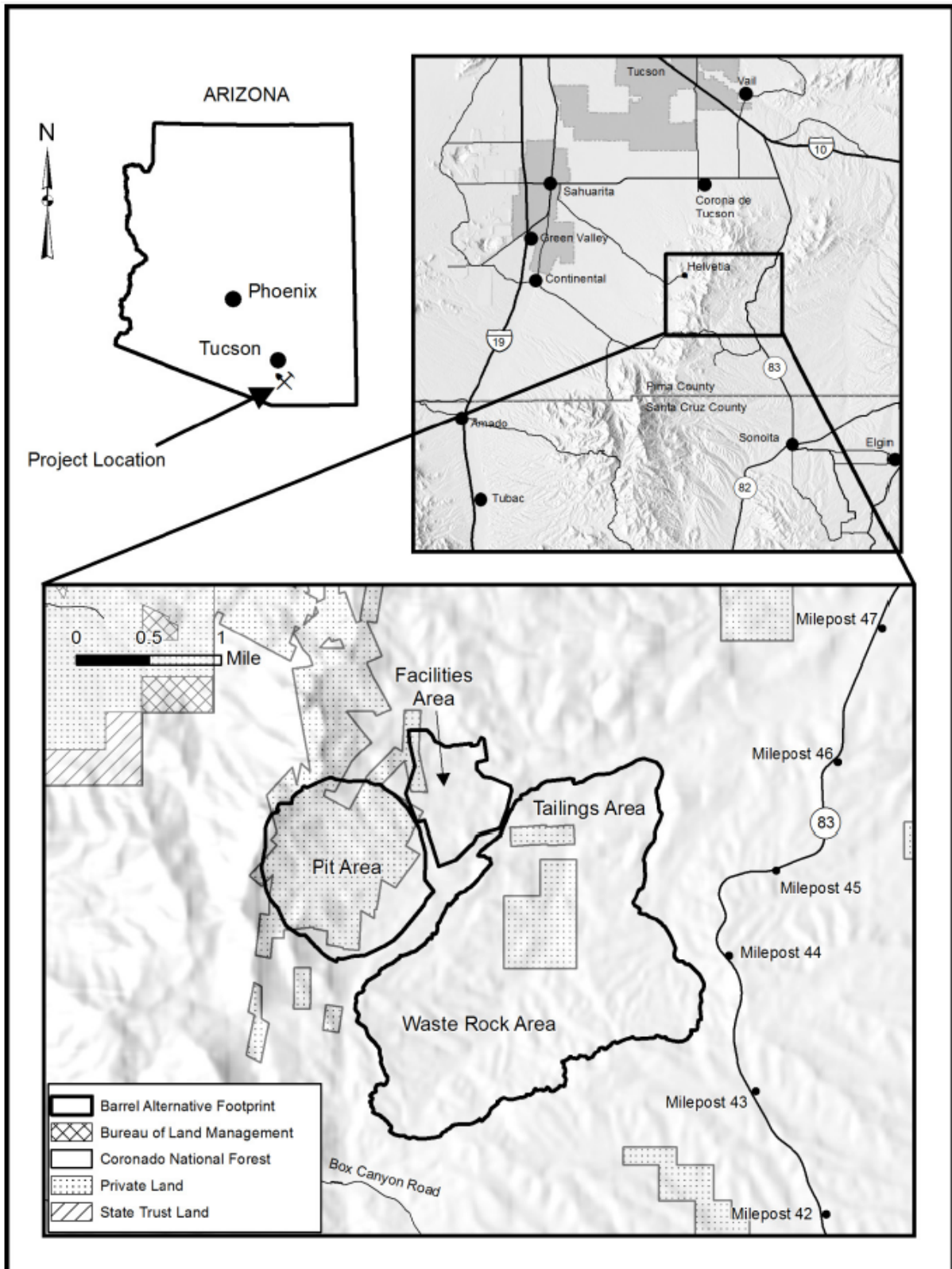


Figure 3.1 - The Proposed Rosemont Copper Project - location and facilities (source: Final Environmental Impact Statement for the Rosemont Copper Project reproduced with permission of Coronado National Forest)



**Figure 3.2 – The proposed Rosemont Copper Project site and surrounding area (Imagery ©2016 Google).**

that have been identified in the eastern Santa Rita Mountains area: the first being the bedrock which is a deep flow system that flows predominantly through fractures and has low storage capacity. The second is the basin-fill deposits, a shallow flow system with higher storage and groundwater flows mainly through the unconsolidated deposits. Fault zones in these canyons may enhance the groundwater flow and permeability. The groundwater flow is eastward, towards the Davidson Canyon and Cienega Creek surface water drainage. The interaction between these two systems occurs mainly in the upper regions of the watershed. Hydraulic connection between the shallow and the deep flow systems occurs when there are significant precipitation events and storm water runoff (El Ouni and Brusseau 2016).

Cienega Creek is a tributary of the Santa Cruz River and feeds in to the aquifers of the Tucson Basin, from which the city of Tucson’s water supply is abstracted. Before the advent of extensive groundwater pumping, aquifers tended to be close to the surface, especially along the river channels. Thus, during the long dry season, perennial flows supported lush and bio-diverse riparian corridor with cottonwoods, willows and mesquite forests (Serrat-Capdevila 2016). However, water abstraction for agricultural and municipal development have seen reductions of water table levels. Consequently, the remaining perennial watercourses harbour some of the few remaining riparian



and aquatic habitats in the region, some retaining the original ecological character of the area prior to 1900 (Yaneva 2016). Designated conservation areas and protected waters include the Bureau of Land Management's Las Cienegas National Conservation Area (NCA), Pima County's Cienega Creek Natural Preserve, and the Arizona Department of Environmental Quality-designated 'Arizona Outstanding Waters' of Davidson Canyon and Cienega Creek itself (see Figure 3.3). The wider watershed contains about 1264 km<sup>2</sup> of scrubland and 13 km<sup>2</sup> of herbaceous rangeland. Evergreen forests cover about 130 km<sup>2</sup> in the higher elevations. These habitats support a variety of plants and animals which are endemic and/or endangered, including the iconic Saguaro cacti, leopard tree frog, gila topminnow and jaguar. Challenges regarding resources in the Cienega Creek watershed include soil erosion, excessive runoff, aquifer overdraft and habitat fragmentation (USDA Natural Resource Conservation Service 2007).

As well as – and because of - these ecological attributes, the Santa Rita Mountains, the Cienega Creek watershed, and the surrounding landscape have significant values for their ecological, cultural, recreational and economic uses. The nearby Tohono O'odham tribe retain strong connections to the area, which contains a number of significant cultural resources, including burial grounds, traditional food-gathering areas and sacred springs. The Coronado National Forest, Las Cienegas NCA and the other notable sites are also a draw for birders and naturalists, hikers, mountain bikers, four-wheel drive enthusiasts, hunters, and general leisure users from the local area, Tucson and further afield. The nearby State Highway 83, which passes nearby to the proposed mine site, is a 'scenic highway' which attracts visitors wishing to view the landscape. Numerous livestock ranches occupy the lands between those owned by the federal government. Meanwhile, the nearby towns of Sonoita and Patagonia have (particularly in the case of the latter) transitioned to recreation and tourism economies based on a number of wineries (one of which is downstream of the proposed mine site) hospitality, catering and independent retail.

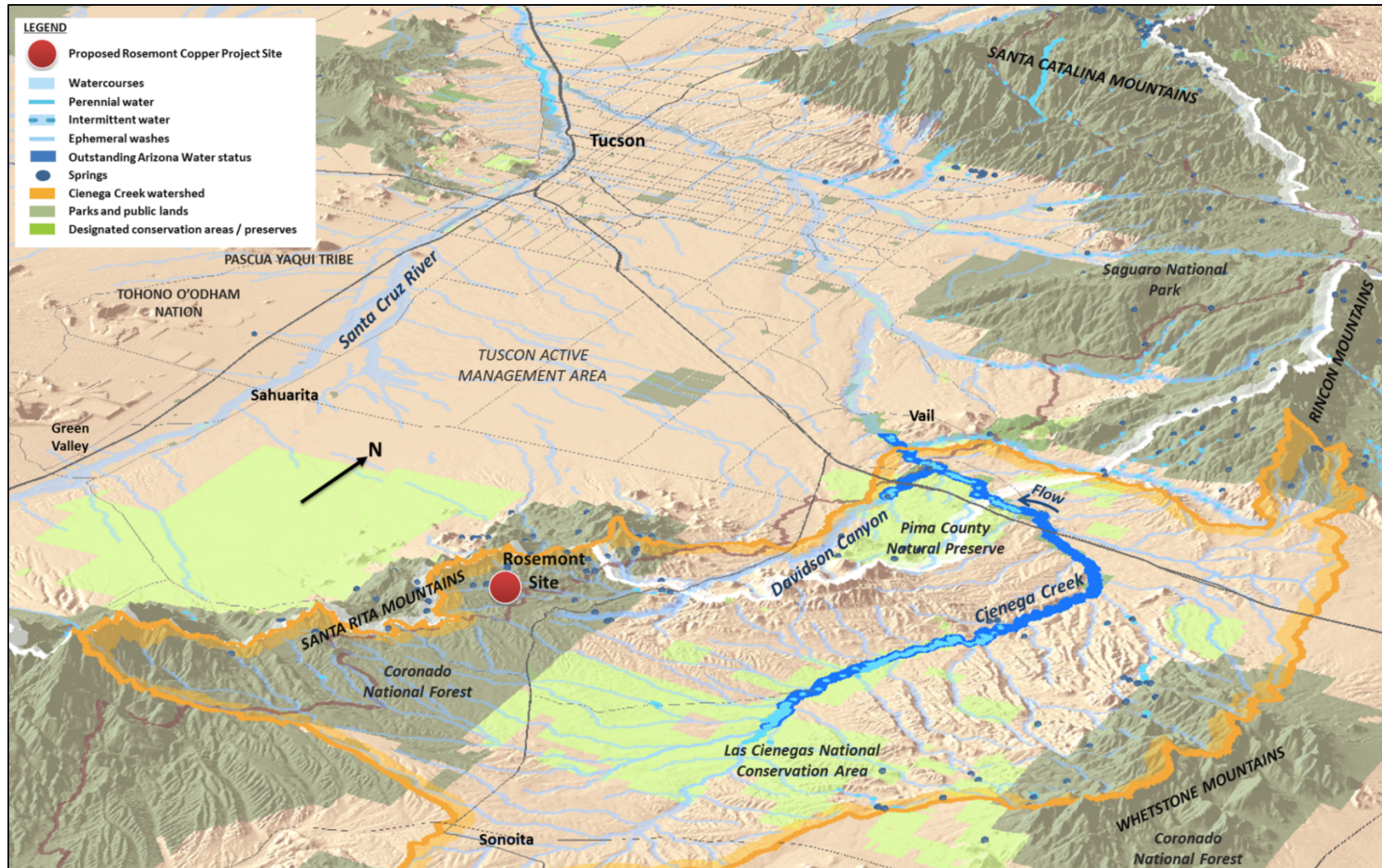


Figure 3.3 – Proposed Rosemont Copper Project: location including Cienega Creek watershed and nearby land ownership/designations (adapted from Cienega Creek Watershed Map, with permission of Pima Association of Governors)

### 3.1. The case study

In disciplines such as human geography and sociology, conventional wisdom has often held that the 'case study' is of limited scientific value. In this view, the inability to make wider generalisations on the basis of an individual example meant that the case study cannot contribute to scientific development. At best, the case study was seen as a potentially useful means of generating hypotheses, which could then be tested using other deductive methods across a broader sample of objects. At worst, the case study approach was castigated for containing an inherent subjective bias towards the verification of the researcher's preconceived notions (Flyvbjerg 2006). However, whilst not dismissing out of hand the importance of research that focuses on large random samples or entire populations, the post-modern and reflexive turns in the social sciences have largely upended these prejudices against the single case as an object of study.

Thus, it is contended that while not generalizable to populations or universes, case studies are generalizable to macro-level theories and/or meso-level structures such as those which were identified for this research. Thus, the external validity of a theoretical proposition can be tested against actually existing phenomena. In so doing, the breadth of knowledge generated using traditional scientific approaches is sacrificed for a greater depth of understanding of complex systems situated within specific contexts such as Southern Arizona (Yin 2003, 2014). Equally, accusations of a lack of scientific rigour have been countered by the argument that not even laboratory experiments or surveys are free from the predispositions of those who conceive them (Flyvbjerg 2006). Indeed, fundamental to the qualitative approaches which form much of the tool kit of case study research is a commitment to reflexivity, to making explicit the subjective influences upon the researcher and considering the implications for what can legitimately be said about the case in light of this knowledge. The latter is aspect is discussed in relation to this research in Section 3.7 below.

In general however, a single case study approach was considered appropriate for the aims of this research because asking questions of 'how', 'what is the nature of' and 'what is the role of' imply the desire to understand the contextual conditions, believing that they might be highly pertinent to the phenomena of study. Such questions are by nature more explanatory than those which ask 'how many', 'how much', 'who' and/or 'where', which are likely to favour methods which seek to quantify phenomena over space and time. The case study, by contrast, lends itself to contemporaneous situations which over which the research cannot exercise any degree of control (Yin 2003). As opposed to a focus solely on historical events, the research conducted for this thesis sought to shed light on an immanent situation, situated within its specific geographical, historical, cultural, political

and economic context. In particular, the aim was to focus on knowledge controversies that constitute what Michel Callon termed a “hot situation”, through which new insights on questions of the relationship between science, democracy and governance could be obtained (Callon 1998).

Notwithstanding the above, a distinction needs to be made between the case study as an object of investigation and the methods employed to investigate it, which may include techniques which have been epistemologically juxtaposed against ‘case study research’ as an approach. Thus, incorporated into the investigation of the single case study is a suite of intensive and extensive methods in triangulation (Stake 1995, Yin 2014) within a broad critical realist framework to collect and interpret multiple forms of evidence in response to the research objectives (Yin 2014) (as is discussed in Sections 3.2 to 3.6 below). The internal rigour and construct validity of the work is further assured through the logical organisation and presentation of the evidence, both during the research process and in its dissemination. This chapter describes the use of Computer Assisted Qualitative Data Analysis Software (CAQDAS) as a means of creating a case study database of both the data collected and the interpretation of this information. Meanwhile, this thesis itself maintains a clear chain of evidence between the narrative and the data collected, through footnotes and appendices (Yin 2014).

### 3.1.1. Selection of the case study

The research conducted for this thesis was part of a project entitled *Sustainable Water Action: Building Research Links Between the European Union and the United States (SWAN)*. The SWAN project was funded by the European Commission under their 7<sup>th</sup> Framework Program to incentivise international and trans-disciplinary academic collaboration on water-related issues. Among the six institutions participating in the project were the University of the West of England and the University of Arizona (UoA), in Tucson, United States. Participation in the SWAN project provided the opportunity for postgraduate students and researchers to visit Tucson and spend time in area. As students, we were thus situated within a community of locally-embedded academics, practitioners and citizens involved in water-related issues in the area. It was through interactions with this community that the Rosemont Copper Project, and the ongoing NEPA EIS impact assessment process for this proposed copper mine in the Santa Rita Mountains, near Tucson, emerged as an object of interest.

However, this was not solely an opportunistic selection for a case study. Rather, it was the product of a carefully worked out set of choices in the iterative process of forming a project, during which a number of alternative trajectories were considered. The initial proposal was a comparative study of

public participation in water management between the United Kingdom, the Netherlands and the Tucson Basin. However, as the process went on, the value of a comparison between two regions characterised by very distinct geographies and sociocultural and legal-institutional histories did not become clear. The possibility of a more ethnographic account indigenous community relations with water and development was also discounted, but for different reasons. In the latter instance, pragmatic and ethical considerations were instrumental. The amount of time and level of immersion required for such a study, and my own position as a white, British academic, rendered this option both impossible within the confines of a PhD and ethically challenging.

However, at the time of my joining the project, the particular pressures in relation to water and development in the Southwest region had led to a focus on the 'Tucson Basin' as the geographical focus of this collaborative effort.<sup>41</sup> The rationale for this choice was that the Tucson Basin "provides a natural basis for anchoring methods and approaches to a contextual reality" (Poupeau *et al.* 2016: 3). Located in the headwaters of the Tucson Basin, the Rosemont Copper project had been a highly contested and controversial proposal, posing questions of regional economic development, water scarcity and environmental protection. In other words, whilst remaining practically feasible, as a 'hot situation', Rosemont was an empirical case corresponding to the theoretical perspectives on democracy that I had been critically engaging with. Notwithstanding the institutional history of EIA and NEPA, in which participatory elements have been retrospectively inserted into a rationalist process of analysis, this thesis argues that the Rosemont case represents: an example of the relationships between power, science and governance; the consequences for the legitimacy of the NEPA EIS process and the decisions that are the product of those relationships; and the implications for alternative theories of democracy and the political.

The selection of this case study was also one which was, in the numerous discussions I had, sensible to other members of the scholarly community of which I was a part (Flyvbjerg 2006). Indeed, the network of academics and practitioners formed over the course of the SWAN project offered considerable scope for contacting key informants. This first of these was with a lawyer working for a group opposing the Rosemont mine, who also happened to have been involved in the institution of the NEPA legislation in the 1960s. The contact was provided through an academic working on an affiliated project at the University of Arizona. From this interview, I was able to gain a broad

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<sup>41</sup> The Tucson Basin is one of a number of 'basins' which comprise the semi-arid 'basin and range' landscape of south-eastern Arizona. It is loosely delineated as a physiographic basin (or depression) bounded by the Santa Catalina Mountains to the North, the Rincon Mountains to the East, the Santa Rita Mountains to the South, and the Tucson Mountains to the West. Situated within the Tucson Basin is the city of Tucson, the second-largest city in Arizona.

historical overview of the Rosemont story and of the main protagonists – albeit from a certain perspective. Nevertheless, through this individual, a number of other contacts, and the practice of ‘snowballing’ for further ‘key informants’, I was able to begin to visualise the outline of a thesis which centres on the EIS process for the proposed Rosemont Copper mine.

### 3.1.2. The proposed Rosemont Copper Project – background

In July of 2006 a Canadian mining company, Augusta Resource Corporation submitted a proposal to the United States Forest Service to develop acquired mineral rights in the Helvetia-Rosemont mining district in Pima County, southern Arizona.<sup>46</sup> The open-cast mine was to be sited partly on publicly-owned land within the Coronado National Forest (CNF - part of the National Forest System managed by the Forest Service), situated in northern Santa Rita Mountains, near the city of Tucson. The CNF’s extensive lands (totalling 7,200 km<sup>2</sup>) form an archipelago of upland open spaces of varying topographies across south-eastern Arizona and southwestern New Mexico. The submission triggered the process for assessing the environmental impact of the proposal under the NEPA regulations<sup>47</sup>, and marked the beginning of a new chapter in a recent history of conflict relating to mining claims in the area. Over the following decades, the Rosemont Copper Project has been at the centre of passionate debate around its purported economic benefits and environmental impacts, in which the Forest Service has been tasked with mediating the many conflicting voices – through processes of public involvement required by NEPA – towards a legitimate decision on the proposal.<sup>48</sup>

The Rosemont-Helvetia mining district sits at 1,402 metres elevation on the eastern flank of the Santa Rita Mountains (see figure 3.1) in Pima County, Arizona, approximately 30 kilometres south of the city of Tucson. Historically, the district had a relatively small production of copper ore, principally from underground mines (Wahl Pierce and Bolm 1995). In the 18th century the Spanish mined in the area, discovering silver deposits for their king (Ascarza 2013, Schrader and Hill 1915). When Americans began to enter the region from around 1855, private prospectors established more prominent mining settlements in and around Santa Rita Mountains. A flood of entrepreneurs

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<sup>46</sup> Augusta Resource Corporation were what is colloquially known in the industry as a ‘junior’ mining company - one with sufficient capital and resources to purchase a site, assess the viability of a potential resource, and undertake the required environmental permitting. These sites are then typically sold on as a ready-to-mine package, usually to a larger operator (Valance 2012). In this case, Augusta Resource was Acquired by Canadian firm Hudbay Minerals LLC in 2014 with the NEPA EIS process still ongoing.

<sup>47</sup> If there is a likelihood such a development will cause “significant disturbance of surface resources” to National Forest System (NFS) land, Forest Service regulations (36 C.F.R. § 228.4) require that the developer submit a Mine Plan of Operations (MPO) to the authorised officer responsible for the relevant ranger district. Having received an MPO, the authorised officer, usually the Forest Supervisor, must begin the process of analysing the proposal under the CEQ’s NEPA regulations.

<sup>48</sup> As of 28 April 2017, the final decision on the proposal remains outstanding.

established mining claims across the area, and a considerable amount of industrial growth was achieved during this period, until mining was all but brought to a halt by the onset of the American Civil War in 1861 (Schrader and Hill 1915). Subsequently, the growth of mining in the region centred on Tucson – today Arizona’s second largest city, after Phoenix, with a population of 520,000 – with the University of Arizona established in 1885, with Mining and Geological Engineering as one of the foundational departments. As a result, the city and the university grew as a hub for the mining industry into the 20<sup>th</sup> century.

It was not until 1872 – the same year that the General Mining Act was passed – that the first recorded commercial mining activity took place on the Helvetia side of the Helvetia-Rosemont district, on the western slopes of the Santa Rita Mountains. Mining at Rosemont, on the eastern slopes, did not begin until October 1894, when the Rosemont Smelting and Mining Company began extracting ore from small open cuts and shallow underground workings (Briggs 2014). By this time the completion of the Southern Pacific Railroad had been a potent factor in opening up the territory to immigration and capital. Underground mines began to be constructed to a considerable depth, and copper smelters were established at Helvetia and Rosemont. By 1950, annual copper production from the Helvetia district totalled 206,200 tonnes of ore containing 7,840 tonnes of copper (Creasey and Quick 1955, Schrader and Hill 1915).

Following a severe decline of the copper market, the last recorded production in Helvetia-Rosemont was in 1961, after which mining claims in the district went through a succession of owners. In 1973, Anamax Mining Company acquired the Helvetia-Rosemont claims, and in 1977 purchased the Empire Ranch and Cienega Ranch to the east of the mine site, for the purpose of securing the water rights attached to the land for future use in mine processing (Briggs 2014). When Anamax ceased trading in 1985, the company assets were sold to ASARCO. That the sale did not include the Empire and Cienega ranches would later prove significant, as they were subsequently sold – along with the water rights – to the Bureau of Land Management (BLM) (Briggs 2014, Wahl Pierce and Bolm 1995). Following the efforts of the BLM and a group of stakeholders led by the Sonoran Institute (calling themselves the Sonoita Valley Planning Partnership), in 1999 these parcels of land were designated as the Las Cienegas National Conservation Area, which – as discussed in the following chapters – would become one of the key battlegrounds in the fight between the proponents and opponents of the Rosemont Copper Project.

It was a NFS land acquisition proposal by ASARCO that led to the formation of opposition group Save the Scenic Santa Ritas (SSSR) (Briggs 2014). SSSR petitioned almost 3,000 people against the proposal (SSSR 2015), and lobbied the Pima County Board of Supervisors, who subsequently voted to reject



the deal. In 2004, however, the Helvetia-Rosemont property was sold to another real estate company, Triangle Ventures. Subsequently, Pima County themselves had an opportunity to purchase the Rosemont estate from Triangle, which could have seen the land designated for preservation as public open space. However, the real estate company stood to make what was seen as an exorbitant profit from the transaction, and the County Supervisors decided that it was not politically expedient to proceed. This proved to be an important turning point in the story of the Rosemont property, as the following year Triangle agreed to sell to Augusta Resource Corporation.

### 3.1.3. The Rosemont Copper Project NEPA EIS process

The CEQ's 'Collaboration in NEPA' handbook provides guidance on the approaches which should be used by federal agencies to engage the public at each stage of the NEPA EIS process. Having determined a 'need for action' following a proposal that is likely to cause 'significant' environmental effects (see Figure 3.4), the process proceeds in three phases, each at which the public must be invited to participate in the development of the Environmental Impact Statement (EIS). The first phase is 'Public Scoping' (Figure 3.4, stage 10), the goal of which is to engage all concerned parties in the definition of the scope of issues to be addressed in depth in the EIS. Once a Draft EIS has been produced (Figure 3.4, stage 11), the public must then be invited to review the document and submit comments (Figure 3.4 stage 12). This input must be analysed, responded to and, where appropriate, incorporated into the production of a 'Final EIS' (Figure 3.4, stage 13). Under new regulations as of March 27, 2013, the Final EIS is then subject to an additional stage of public involvement.<sup>49</sup> Under the new 'Pre-Decisional Administrative Review Process', commonly referred to as the objection process, individuals and entities who had previously submitted comments may file objections which must be responded to before a final decision is issued (Figure 3.4, stage 15).

Augusta's MPO was accepted by the Forest Service in March of 2008. This initiated the process of evaluating the proposal under NEPA regulations. Over the course of the proceeding process, nineteen individuals from the Forest Service and 21 individuals from an environmental consulting firm contributed to the analysis as part of the 'ID team'<sup>50</sup> for the project. This group included experts in a range of fields, including geology, biology and ecology, tribal consultation, rangeland management, water resources, reclamation, recreation and wilderness, socioeconomics and

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<sup>49</sup> 36 CFR 218

<sup>50</sup> CEQ regulations require that the disciplines and skills of the ID team are appropriate to the scope of the action (40 C.F.R. § 1502.6), the issues and potential effects identified, and applicable laws and regulations (40 C.F.R. § 1501.7). The team must also have the expertise to identify and to evaluate the potential direct, indirect, and cumulative social, economic, physical, and biological effects of the proposed action. In addition, an appropriate ID team leader must also be selected.



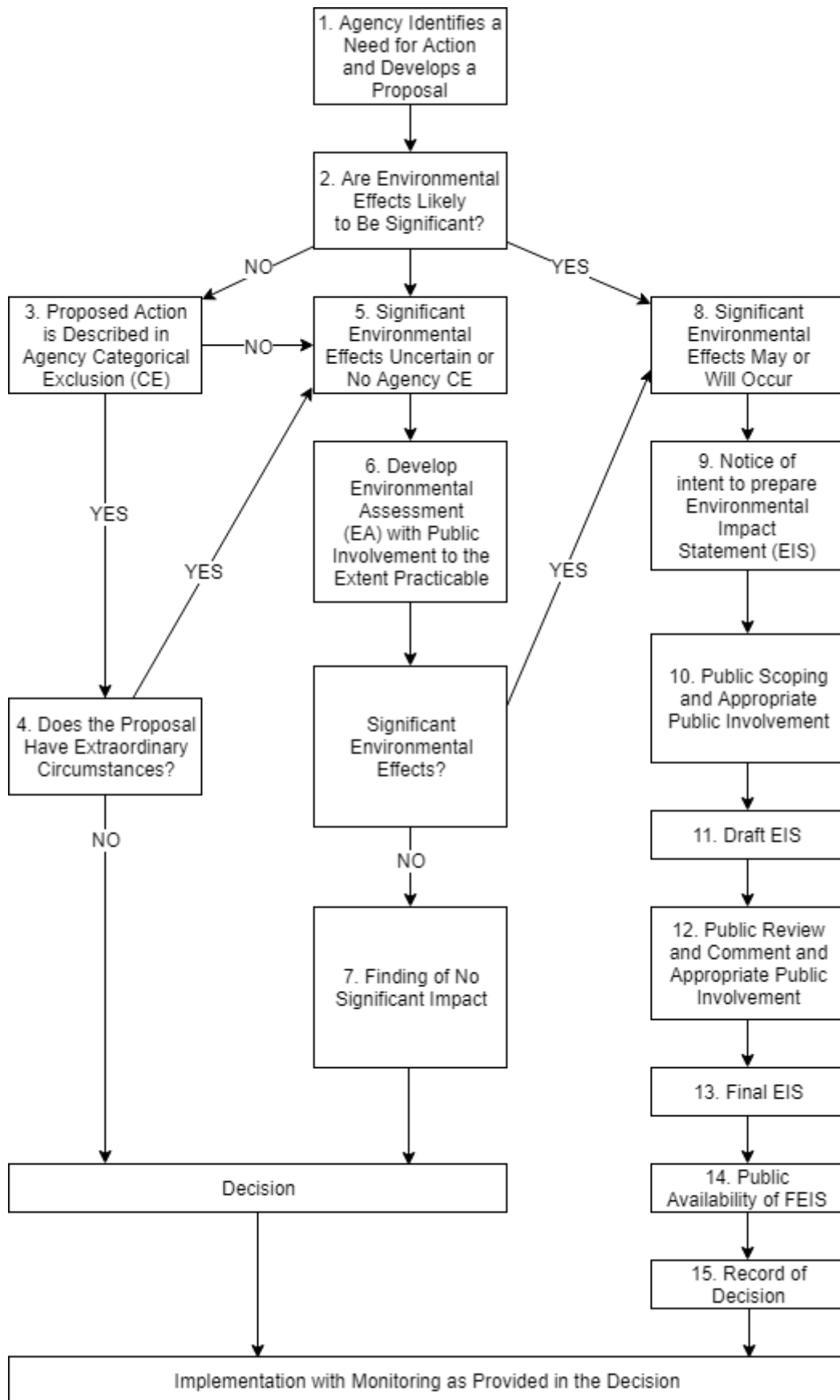


Figure 3.4 – The NEPA EIS Process (adapted from CEQ 2007b).

environmental justice, air quality, climate change, and the NEPA EIS process itself. In addition to the Forest Service and the ID team, a further seventeen local, state and federal agencies accepted invitations to contribute as 'cooperating agencies' in formulating the EIS. Having established that proposed mine had the potential to cause 'major and significant' impacts to the quality of the human environment, this committee were responsible for the proceeding impact assessment (EIS) process.

As mandated by the CEQ regulations, each stage in the NEPA EIS process was preceded by the facilitation of various means by which the public, alongside the cooperating agencies and various other interest groups, were involved in the process. Firstly, the Forest Service conducted a public 'scoping' process, the aim of which was to:

identify the public and agency concerns; clearly define the environmental issues and alternatives to be examined in the EIS including the elimination of nonsignificant issues; identify related issues which originate from separate legislation, regulation, or Executive Order (e.g. historic preservation or endangered species concerns); and identify state and local agency requirements which must be addressed<sup>51</sup>.

The public scoping period, which was announced immediately following the submission of the Rosemont mine proposal, was the first opportunity for the public and all interested parties to be involved in the NEPA EIS process. More than 1,000 people attended public meetings facilitated by the Forest Service during this period. The agency received 11,082 comment submissions in written and oral form, from which approximately 16,000 discrete comments were identified. The scoping period concluded on 14th July 2008, and it was not until October 2011 that the Forest Service published the Draft EIS document for review. This signalled the second opportunity under NEPA regulations for the public to be involved in the EIS process. During the 90-day 'public comment period' the Forest Service again facilitated the submission of comments via a number of means. In addition to mail, facsimile, email and telephone submissions, electronic comments were also accepted on a dedicated project website<sup>52</sup>. Furthermore, both oral and written comments were solicited at a further seven scheduled 'EIS meetings'. The Forest Service estimated that over 4,000 people attended one or more of the seven public meetings held in the affected region regarding the project. Over the course of the Draft EIS comment period, more than 25,000 submissions were received during the Draft EIS comment period. Comments were received from individuals, organized

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<sup>51</sup> Federal Register 48[146]:34283

<sup>52</sup> [www.RosemontEIS.us](http://www.RosemontEIS.us)

interest groups, and businesses. Furthermore, tribal governments, and federal, state, and local government agencies submitted comments in their capacity as cooperating agencies.

The contents of these submissions were then subjected to the process of 'content analysis', developed by the Forest Service (described earlier in Chapter 3). It took the Forest Service six months to identify, code, and formulate responses to all of the valid comments it had received. A total of 316 PCS documents were generated, each corresponding to particular area of concern in relation to the Draft EIS. These files were entered onto an indexed 'commenter response database' which was published in CD-ROM format along with the Final EIS in December 2012. Additionally, all of the original submissions were transcribed onto PDF files, including a header providing the respondent's name, organisation, address, email and telephone number. These files were also uploaded to website where members of the public could search for comments by name and/or key words. It is this substantial comment database that forms the basis of the thematic analysis which frames the proceeding chapters.

### 3.2. Epistemological underpinnings

The research for this thesis has been developed from a critical realist perspective (see Bhaskar 1975), one of three broadly defined epistemological approaches that may have formed the basis for the methodology used for this research. Positivism (or empiricism) (Comte 1868) and constructivism (or interpretivism) (Berger and Luckmann 1966) are the other two theories of knowledge that have predominated in western thought since the enlightenment. This section thus provides the rationale for the selection of a critical realist approach over positivism and constructivism.

During the twentieth century, positivism was the dominant philosophy of science. It is an approach which posits that observable phenomena can be placed before the researcher, who gathers or systematises them – objectively, without being influenced by values, theology or metaphysics – and presents them as verified 'facts'. Indeed, Nietzsche (Nietzsche 1901: 267) described positivism as a doctrine that "halts at phenomena: 'there are only facts'." To which Nietzsche ripostes: "No, facts is precisely what there is not, only interpretations" (ibid). Kuhn's (Kuhn 1970) analysis of science as a procession of paradigms showed the absence of a final ground for an objective knowledge or ultimate 'truth'. Thus, as the object of analysis for this thesis is constantly evolving and changing, it would not be possible to base that analysis on a stable, observed truth of the democratic nature of NEPA, as would be required from a positivist approach (Danermark *et al.* 2002).

In Chapter 2, I discussed the developments in the philosophy of science that followed the emergence of constructivism and Thomas Kuhn's influential critique of positivism. In constructivist and post-

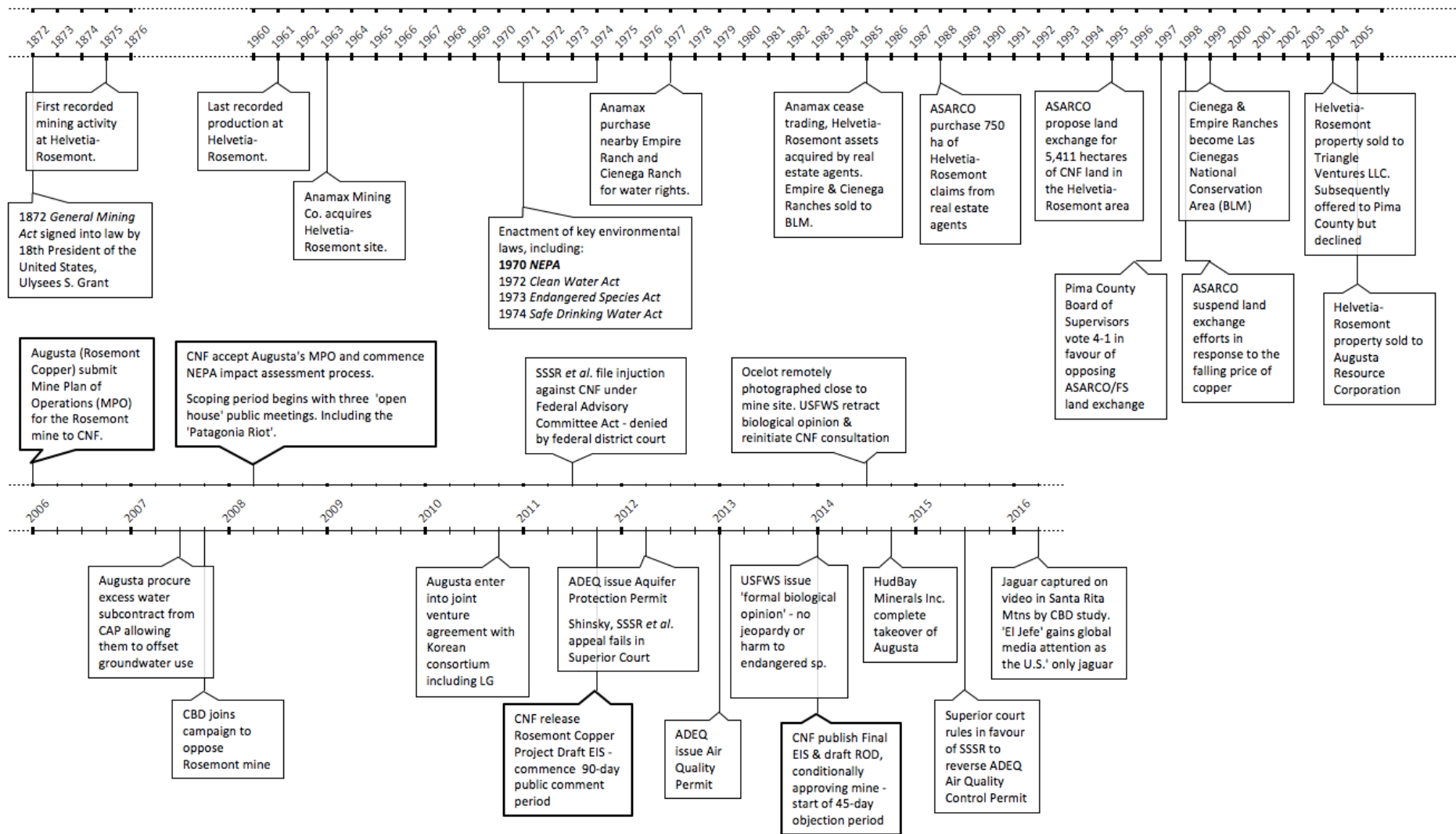


Figure 3.5 – Timeline: historical background (top); and events relating to the Rosemont Copper Project NEPA EIS process (bottom).

positivist approaches – and the various branches and disciplines which descended from them, including Actor Network Theory and political ecology – “the purpose of scientific activity no longer stands out as a statistical putting together of surface phenomena in an observed reality. The important thing rather becomes to conceive this reality as an expression for, or a sign of, deeper-lying processes” (Alvesson and Sköldberg 2009: 18). Constructivism posits that reality and knowledge are located in the minds of individuals; therefore, an objective reality cannot be known since it is inextricable from the context in which it was created (hence the pseudonyms for constructivism, contextualism or interpretivism) (Robson 2002). Knowledge about the world is therefore constructed through individuals’ experiences and linguistic reflections on the phenomena around them (Savin-Baden and Major 2013). However, as well as calling into question the existence of a purely rational, objective knowledge; constructivists argue that knowledge arises from processes more related to ideology, interests, or power. The central pioneers for this approach were Peter Berger and Thomas Luckmann, through their classical book *The Social Construction of Reality* (Berger and Luckmann 1966).

Critical realism sits between positivism and constructivism, simultaneously accepting that it is possible to provide evidence of objectively existing phenomena, yet appreciating that this interpretation of knowledge is a social construct. While from a critical realist’s perspective, an absolute truth remains beyond apprehension, it remains possible to generate knowledge that improves our understanding of the social and physical worlds (Cruickshank 2003). Critical realism thus seeks to identify the deeper lying mechanisms which are taken to generate empirical phenomena. Roy Bhaskar, considered the founding father of the approach, describes this as a shift from epistemology to ontology, and within ontology, as a shift from experiences to events mechanisms, and underlying structures (Bhaskar 1975). He distinguishes between three levels of knowledge: empiricism (simple experiences); actualism (experiences, and the events that give rise to experiences); and realism (the underlying ontology and structures that give rise to events and experiences) (ibid).

Chapter 2 argued for the imperative to ground the abstract, *macro*-level theories of the democratic through an empirical account of the *meso*-level institutional practice and the *micro*-level of ‘hot situations’ or events. For Andrew Sayer – another key thinker of critical realism (Sayer 1992) – the ‘causal’ explanation of events is facilitated by the elucidation of the relationship between the concrete and the abstract. Following Bhaskar, for Sayer what is required is to link concrete events, at the *micro*-level, to the *meso*-level mechanisms through which they are produced, and onward to the *macro*-scale structure and constitution of the objects which possess them. In this way, theoretical

and empirical research are combined in a move from the concrete to the abstract that employs a mixture of methods. Firstly, 'extensive' methods are used to produce descriptive, representative generalisations of certain objects and events as they relate to various taxonomic groups of interest. This type of research typically employs descriptive and inferential statistics and numerical analysis (e.g. cross-tabulations), and large-scale formal survey-questionnaires of a population or 'representative sample' thereof (Sayer 1992).

Secondly, 'Intensive' methods are used to explore in greater depth the causes of the production of such phenomena. Qualitative methods, such as participant observation and unstructured or semi-structured in-depth interviews, are typically of intensive research (Sayer 1992). This increases the scope for gaining access to the meanings which respondents ascribe to their experience of social and geographic worlds, offering a more nuanced ear to a range of different voices (Cloke *et al.* 2004). Subjects are able to engage in a less affected mode of communicating, in which they are free to answer in terms of the significance of their own circumstances. Instead of having to affect ignorance in order to ensure uniformity or objectivity, the researcher is able to refer to and build upon knowledge gained in advance about the specific characteristics of the respondent (Sayer 1992).

The research conducted for this thesis adopted a mixed methods approach within this broad 'Sayerian' critical realist framework. As Cloke *et al.* (2004: 127) argue, however, this distinction between extensive and intensive approaches can "tend to be over rigorous in 'pigeon-holing' particular practices of constructing and interpreting data." In practice, a particular project might be a combination of several types of research, employing extensive/generalising as well as intensive/concrete techniques of enquiry. Intensive and extensive research designs may also be complementary rather than competing. For example, the greater level of detail in intensive studies need not be overwhelming if a descriptive background can be built up using extensive methods. Conversely, the volume of data in extensive studies can be made more comprehensible through the qualitative knowledge gained through intensive methods. This enables the selection of causal groups and the exclusion of individuals and data which do not interact with the area of interest, thus rendering the "logic of the situation" easier to discover (Sayer 1992: 247).

### 3.3. Research design

The overall research design, relating data sources to methods of data collection and analysis, and the research questions set out in Chapter 1, is mapped in Figure 3.6. The approach first adopted 'intensive' data collection methods of archival research, participant observation, and in-depth interviews. Focussing on 'the archive' in the broad sense, the approach described in Section 3.4.1

explored the existing academic and grey literatures, press, digital media, and other textual visual materials relating to the chosen case study. This data was supplemented through participant observation at various meetings, lectures, field trips and other events, as described in Section 3.4.2. The notes and fieldnotes generated from archival research and participant observation were critical in contextualising this research and in framing the subsequent methods and analyses. The in-depth interviews described in Section 3.4.3 focussed on the insights of key informants (respondents) around the Rosemont issue. The intensive phase culminated in the thematic analysis described in Section 3.5. Triangulated with the insights from the archival research and participant-observation, the thematic analysis informed the discussion on the articulation of spatial relations of power in respect to the proposed mine (RQ3, discussed in Chapter 6).

The ‘extensive’ phase focuses on the Forest Service’s EIS process for the proposed Rosemont Copper Project. As described in Section 3.6.1., it firstly entails a Thematic-Spatial Analysis of the written comments submitted by the public in response to the Draft EIS. This is a hybrid, two-stage form of the same thematic analysis process described in Section 3.5, which: (1) analyses the themes of

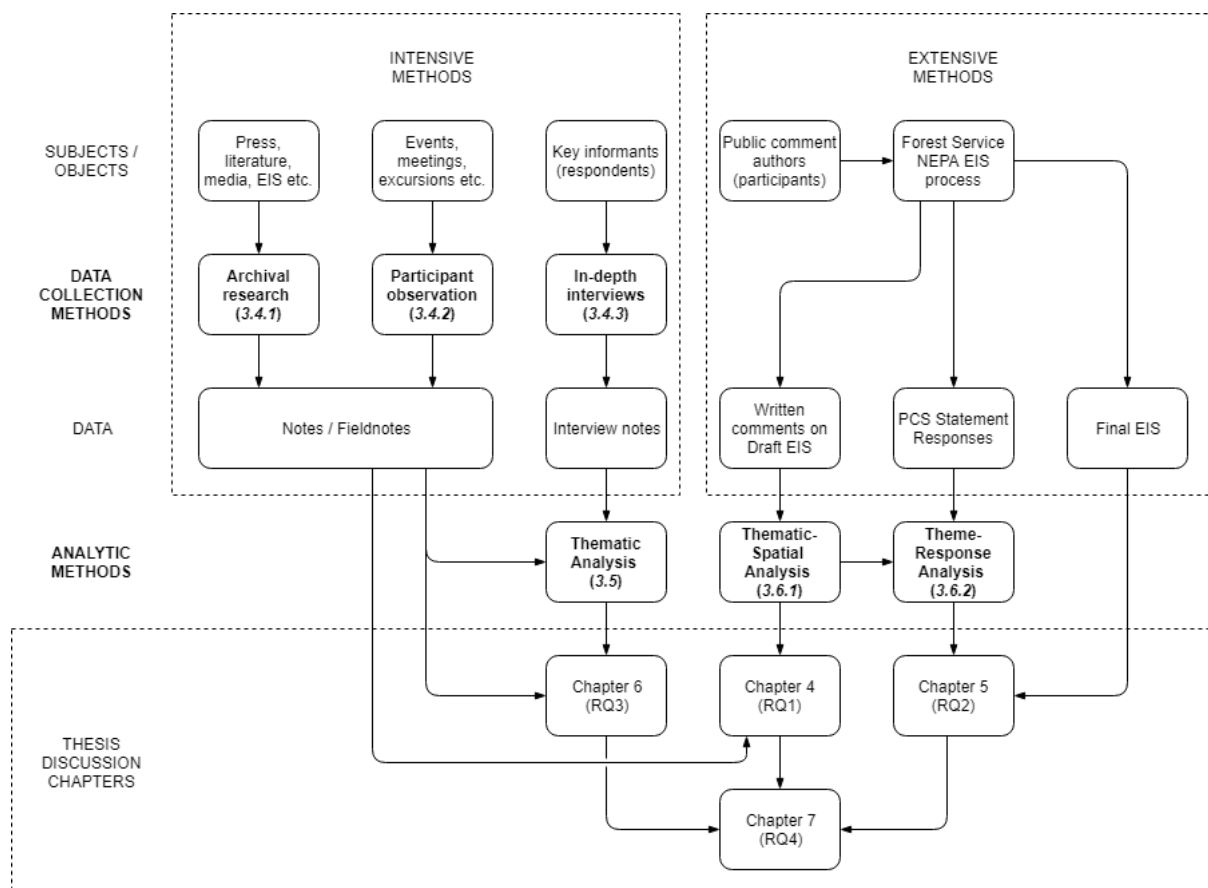


Figure 3.6 - Research design and relation to research questions (RQ1 to RQ4) and following chapters.

concern in the public comments; and (2) identifies the key issues by quantifying their prevalence in relation to participants' residential locations.<sup>54</sup> This spatial element is expressed in terms of scales of proximity in relation to the proposed mine site. This Thematic-Spatial Analysis frames the discussion in Chapter 4, in which a narrative of the nature of competing discourses in relation to the Rosemont mine is constructed from the data (RQ1).

Secondly, the focus of the 'extensive' phase shifts to the institutional response of the Forest Service to the public comments. Specifically, there are two objects of analysis: the PCS Response Statements, which are issued in direct response to the public comments; and the Final EIS document, which was published subsequent to the public involvement process. The aim of the 'Theme-Response Analysis' described in Section 3.6.2 was to characterise the nature of the PCS Response Statements in respect to the themes identified in the Thematic-Spatial Analysis described above. Through this analysis, along with observations of the subsequent changes made to the Final EIS, the discussion in Chapter 5 addresses the question of the impact of the public comments process upon the NEPA EIS process in substantive, normative 'democratic' terms (RQ2).

Importantly for the present research, these extensive and intensive approaches are framed in terms of a suite of methods, through which interpretations were checked and triangulated (Mason 2002, McDowell 2010). By such means a comprehensive understanding (Kearns 2000, Sayer 1992) of the Rosemont case study was developed in Chapters 4 to 7.

#### 3.4. Researching 'intensively'

A foundation of the fieldwork for this research was thus the notion celebrated by anthropologists and ethnographers as "being there" (Geertz 1988, Kearns 2000, Watson 1997). My time in southern Arizona included short (1-2 week) visits which coincided with SWAN project meetings and longer stints from January to June 2014 and March to May 2015. As Section 3.4.1 describes, whilst living and studying in the city of Tucson, I immersed myself in the various sources of archival information relating to the case study and surrounding topics. Furthermore, as related in Section 3.4.2, I engaged as much as possible with ongoing scenes, events, places and people directly or indirectly related to the issues surrounding the proposed Rosemont Copper Project through the practice of observing and participating. It was these archival and participant-observation activities which informed the subsequent in-depth interviews with key informants described in Section 3.4.3. As and when

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<sup>54</sup> It is important to clarify the distinction between the terms 'participants' and 'respondents' for the discussions in Chapters 4-7. 'Participants' is used in the public sense to describe those who participated in the NEPA EIS process for the proposed Rosemont Copper Project. 'Respondents' refers to interviewees for the intensive fieldwork conducted.



appropriate throughout the following discussion, I reflect on researcher-subject positionality in respect to qualitative data collection. Ethical considerations are detailed in Section 3.4.4.

#### 3.4.1. Exploring the archive

Exploring the archive relating to the Rosemont issue focussed on both official and non-official sources related specifically to the proposed project itself and to the broader context in which it is situated. Official sources of information are those which may have been produced by government agencies or public authorities, and can often be typified in terms of whether they are, textual, graphical and/or cartographical, aural or numerical. Non-official sources, meanwhile, are those which may have been produced privately by individuals, social groups, voluntary organisations or firms (Clope *et al.* 2004).

While researching official sources, particular attention was paid to their construction, in that their character and content is influenced by the specific cultural, political and economic contexts in which they were produced (Clope *et al.* 2004, Hodder 1994). Similarly, non-official sources, in purporting to tell or represent 'the truth' cannot be understood without acknowledging their selectivity and bias towards particular sets of social relations. More practically, this meant paying attention to a range of concerns that Scott (1990) groups under the four areas of authenticity, credibility, representativeness and meaning. Authenticity is concerned with the physical soundness and certainty over the authorship of a source. Credibility addresses the aforementioned problems of selectivity and bias through ensuring sincerity and accuracy. A concern for representativeness implies an acknowledgement of the sampling bias towards certain groups that is inherent in research. Meanwhile, the issue of meaning pertains to the accessibility of source's language, its levels of interpretive understanding, and, again, the social contexts and relations of power that impinge upon its production (Hodder 1994).

Figure 3.7 details examples of the types of official and non-official archival sources drawn from for this research, and delineates them according to their relation to the field of study. Thus, 'specific' sources are those which address the Rosemont Copper project in particular, while 'general' sources are those which address the broader geographical and historical context in which the case study is situated. The materials obtained during this process, and the insights from them, were recorded in field notes and collated. Electronic copies of these materials and related field notes were uploaded to the NVivo software and thematically coded in line with the analysis outlined earlier in this chapter, so that they could be referenced easily in relation to the extensive dataset.

	Specific	General
Official	<ul style="list-style-type: none"> <li>• NEPA process documentation (e.g. scoping report, EIS.)</li> <li>• Other reports, memos, minutes and correspondence (e.g. Coronado National Forest, cooperating agencies, consultants*, local government.)</li> <li>• Public comments submitted to the Forest Service**.</li> </ul>	<ul style="list-style-type: none"> <li>• Federal and state legislation (e.g. NEPA, mining, water.)</li> <li>• Reports, memos, minutes and correspondence (e.g. CEQ, Forest Service, Environment Agency, Pima County.)</li> </ul>
Non-official	<ul style="list-style-type: none"> <li>• Documentary media (e.g. news articles, interviews.)</li> <li>• Websites and social media.</li> <li>• Publicity and promotional material (e.g. posters, flyers, advertisements.)</li> <li>• Reports, memos, minutes and correspondence (e.g. mining firm or other related businesses, NGOs.)</li> <li>• Histories of the proposed site.</li> <li>• Visual and performing arts, and photography.</li> <li>• Maps.</li> </ul>	<ul style="list-style-type: none"> <li>• Literature (academic, non-fiction or fiction) and media on: mining; water governance; NEPA and other environmental governance; public participation; U.S. constitution &amp; law; development in the western U.S.; economy; culture; national, regional and local histories; the human and physical environment/geography of the region; climate and meteorology.</li> <li>• Press/news media.</li> <li>• Digital/social media.</li> <li>• Maps.</li> </ul>

Figure 3.7 – Archival sources

### 3.4.2. Participant observation

The practice of observing is central to the idea of thorough, formative, exclusive engagement with a single field or case study (Angrosino and Rosenberg 2011). Following Kearns (Kearns 2000: 105), the ‘complementary’ rationale for observation here was “to gather additional descriptive information before, during, or after other more structured forms of data collection. The intent is to gain added value from time ‘in the field’ and to provide a descriptive complement to more controlled and formalised methods such as interviewing.” Thus, through contextual understanding, this approach provided an in-depth interpretation of the issues surrounding the proposed Rosemont Copper Project through immersion in its socio-temporal context, using first-hand observations as the prime source of data.

Observing and listening in the field also entail a degree of active participation, insofar as the researcher is co-creating meaning through bringing their own life experiences and perspectives to analysis and interpretation (Kearns 2000). Indeed, to conscientiously participate in the social processes under observation is to recognise the subjective influence of the researcher on the behaviour and dispositions of those being observed, breaking down the barriers between subject and object which prevent more ‘natural’ interactions and responses (ibid). This points toward a

specific approach employed by social anthropologists and geographers known as participant observation. Participant observation implies entering into a space within which we “position ourselves to observe and be part of the world” (ibid: 104), so that the situated geographies and social contexts of everyday life may be more fully and systematically understood (Cloke *et al.* 2004).

This entails not only planning strategically where and when these situations may be intercepted, but also retaining the flexibility to permit and encourage encounters with the unexpected (Cloke *et al.* 2004). In relation to the former, the archival research described in Section 3.8.1 provided much of the information relating to ongoing scenes, events, places and people with whom I could actively plan to meet in the field. Once I was moving in the right circles, many of these encounters would lead to further connections and opportunities, so that I could continue to accumulate the observations and insights that performed the work of contextualising this research. Events attended included: tour of a working copper mine; excursions to the proposed mine site in question; excursions to surrounding sites of environmental interest; events organised by groups involved in the issue; documentary screening; conferences; and informal meetings with key informants.

Observations and reflections on events attended and encountered in the field were recorded using various approaches to keeping ‘fieldnotes’. As suggested by Emerson *et al.* (2011), depending on the situation in question, a pragmatic approach was taken as to whether it was beneficial to take notes in the course of events or encounters. In certain circumstances, it was necessary to suspend such concerns and participate more fully. This may have been because the activity in question was a mobile or interactive one. However, it may also have been due to obvious sensitivities of the subject in question to being ‘recorded’. In either case, being ‘present’ in this way allows the researcher to relate to the field in a more direct way, reducing the intersubjective distance between the observer and the observed. In these moments, a conscious effort was made to make mental notes or ‘headnotes’, which were used later to construct full fieldnotes (Del Casino Jr 2009, Emerson *et al.* 2011). However, in other circumstances it was possible to make short written reminders, in the form of abbreviated words and phrases on a small notepad. Alternatively, photographs, videos or audio recordings were made using a smart phone (Watson and Till 2010). Meanwhile, a conscious effort was made to gather freely available materials (within legal and ethical norms and rules), such as leaflets, maps, and other artefacts. On occasion, however, participation in naturally occurring events such as lectures or conferences was more explicitly oriented toward writing fieldnotes directly (Emerson *et al.* 2011). Nevertheless, except in rare instances where it was not possible, fieldnotes were completed, supplemented, collated or written up in full at the end of the same day on which the events in question occurred (Kearns 2000).

In order to optimise the quality of the insights gained from observer-participation, I followed Emerson *et al.*'s (2011) recommendations for making headnotes in order to write fieldnotes at a later time, focussing on six principles:

1. initial impressions, including physical setting and other participants;
2. a personal sense of what is significant or unexpected;
3. what those in the setting experience and react to as "significant" or "important."
4. how routine actions in the setting are organised and take place;
5. emotional expressions and experiences as expressed and attended to by those in the setting;
6. general impressions and feelings.

Thus as well as literal or descriptive headnotes to explain the nature of what is occurring, interpretive headnotes attributed some causal explanations or meaning. This is useful in relation to the subsequent analytic process of coding data described in Section 3.4.

### 3.4.3. Interviewing

While questionnaires tend to aggregate individuals into categories which constitute extensive patterns, interviewing offers a more nuanced ear to a range of different voices (Cloke *et al.* 2004). Importantly for the present research, interviews may also be used as part of a suite of methods in order that interpretations may be checked and triangulated (Mason 2002, McDowell 2010). The aim of an interview is to probe an issue in depth in order to explore and understand actions within specific settings, to examine human relationships and discover as much as possible about the meanings behind people feelings and actions (McDowell 2010). Interviewing is an interpretative methodology which offers particular scope for probing meanings and emotions. In comparison to large-scale quantitative techniques such as surveys or questionnaires which look for breadth and coverage, interviews are often associated with single case study approaches and aim for more detailed understandings (*ibid*). As an intensive research strategy, interviewing is both legitimate and necessary in order to create the kind of information which lends itself to the explaining processes, changing conditions, organization, circumstances and the construction, negotiation and reconstruction of meanings and identities. As an approach which makes explicit the intersubjectivities inherent in interview practices, interviewing acknowledges the agency of both the reflexive interviewer and the active subject.

#### - *Structure and content*

Following Jennifer Mason's (2002) guide to planning and preparing for qualitative interviewing, the content and structure of the interviews was designed to ensure that embedded within the sequence

of questions were firm links to research questions and the ontological and epistemological assumptions of the research. Thus from each research question, a set of 'mini'-research questions were formulated, for which an outline was formulated of interview topics, and the main interview questions themselves. Following this, a set of standardised questions was formulated including an introductory explanation of the research, and questions about personal and social characteristics of the respondent. Thus the nature of the interview itself was semi-structured, enabling the date to be "co-constructed as interviewer and interviewee work their way through questions which begin as the 'property' of the researcher but which become co-owned and co-shaped in the unfolding interactivity of questioning, answering, listening and conversing" (Cloke *et al.* 2004: 129).

#### - *Recruitment*

The identification of people who have the requisite experiences, knowledge and positionings came from two sources. Firstly, the contextual research discussed above identified a large number of groups engaged in the debate surrounding the Rosemont mine. These groups occupied various spatial scales and levels of public institutions and civil society; from federal agency employees and state attorneys, to private businesses, NGOs and local residents. With the issue an immanent and controversial one in the local area, many contacts were freely accessible on the internet, in official documents, minutes of meetings and news media. Local newspapers and editorial letters were another source of potential interviewees.

Secondly, existing contacts made over the course of my involvement in the SWAN project were continuously built upon (Rice 2010). Indeed, access to such a wealth of experience in the region of the case study formed a significant part of the rationale for choosing to base my research in southern Arizona. Here the practice of 'snowball sampling' (Bernard 2017, Reed *et al.* 2009) was instigated which would be continued throughout the interviewing phase of the research. In this way, existing acquaintances were asked for potential interview contacts with friends and acquaintances, thus permitting a chain of interviewees to emerge. Of particular interest was getting in touch with potential 'gatekeepers' who handle inquiries about an organization or who are powerful figures within a particular group (Cloke *et al.* 2004).

Eighty-four potential interviewees were identified and collated onto a schedule of names, organisations, contact details and other useful information. Emails were typically used to make first contact with each individual, as addresses were often freely available online. The emails briefly described my background and the project, explained why I would like this person to be in the study, and suggested why he or she should participate. Care was taken to indicate interest in the life or

work of those to be interviewed, and to reassure interviewees that the information would be used in accordance with their wishes. An indication was also given of how much time we imagine an interview will take (Rubin and Rubin 2011). Where no response was received, the email enquiries were followed up with a telephone call. Where the respondent declined the interview, polite enquiries were made as to individuals who might be of interest and willing to participate.

From the list of candidates, 25 interviews were carried out over eleven weeks in the Tucson area, in nearby towns, in the city of Phoenix and also on the mine site itself. The key informant interviewees, who are anonymised in this thesis as discussed in Section 3.8, were from a wide range of relevant state and non-state organisations in various roles and various levels of responsibility, as well as private individuals. These included scientists, directors, activists and other key actors in relation to the proposed Rosemont Copper Project.

#### - *Conducting interviews*

Prior to commencing the interviews, in whichever place and using whichever method of recording, time was taken to establish a rapport with the respondent and ensure that the encounter was a comfortable one for them. This included making sure that they have read the participant information sheet, signed the informed consent form, and answered any questions they have. Perhaps most importantly, I tried to reveal something of myself, my own circumstances and feelings as a way to persuade interviewees of my good faith. In this way the ways interviews were set up to be as collaborative, interactive and reflexive exchange as possible (McDowell 2010), perhaps encouraging the interviewees to reveal some more of themselves in the process.

Follow up questions were employed when an answer appeared: relevant and important; incomplete, vague, or contradictory; too general, too narrow, or too extreme; or when there was a need to explore or test a theme. They were used to fill in missing pieces and pursue contradictions and ambivalence. Useful follow ups included: asking how; asking for comparisons; echo wording; asking, 'what is the alternative?'; asking about components; exceptions; playing devil's advocate; posing the puzzle of the research; generalising; using hypotheticals; and asking, 'what does it mean?'. Probes, in contrast, were used to manage the conversation, while also being effective for interpreting and clarifying. Non-verbal probes were also used as a means of encouragement or assurance that attention is being paid to the interviewee (e.g. 'go on', or eye contact/nodding) (Rubin and Rubin 2011).

Interviews have been described as "conversations with a purpose" (Webb and Webb 1975), "conversational partnerships" and "extended conversations" (Rubin and Rubin 2011). While the

aforementioned guide to the semi-structured interviews which were carried out for this research were valuable in a practical sense, it was important to remember that such “mechanical trudging through of an interview checklist or schedule by the researcher [...] restrict[s] the possibilities for interpersonal drama, and therefore of plot development” (Cloke *et al.* 2004: 155). The main questions were therefore be used to provide the ‘scaffolding’ for the interview, which were fleshed out to greater depth over the course of the interview.

As each interview closed, a particular emphasis was placed on keeping the door open to continue the discussion, perhaps by suggesting revisiting some missed topics at another time, or asking to come back (or call again) to see what is happening with the programs or projects now underway (Rubin and Rubin 2011). A final question, if it had not come up already, was to enquire if they knew of any other contacts who may be interested and of interest for the research. Following the interview, a message was sent to reaffirm thanks for the interviewees’ time, and to forward a copy of the interview notes for them to follow up on or challenge.

#### - *Interview records*

The writing up of interview notes and transcription of recordings was carried out as soon as possible after the interview (Rubin and Rubin 2011). The notes included: basic information on the date, time, and location of the interview, as well as the respondent details; reflexive fieldnotes section in which I wrote up my headnotes relating to the interview, as described in Section 3.4.3; background information on the respondent from preamble conversations; and finally the transcribed recordings and interview notes. These notes were collated for analysis, which was conducted subsequent to the extensive phase described in following section. The following section describes the thematic analysis process, by which the interview notes were coded and interpreted. The results of this process enabled the discussion in Chapter 6 to be directed towards answering the question of how power relations are significant in the politicisation of the Rosemont issue (RQ3).

### 3.5. Thematic analysis

Since procedures for the analysis of qualitative data began to be formalised in the 1960s, the term ‘thematic analysis’ (TA) has been variously used to describe: quantitative content analysis; qualitative content analysis; a quantitative scoring system for measuring cognitive complexity; and a method for analysing the evolution of scientific ideas. Braun and Clarke (2006: 77) describe TA as a “poorly demarcated, rarely acknowledged, yet widely used analytic method within psychology [...] for identifying, analysing and reporting patterns (themes) within data [that] minimally organises and describes your data in (rich) detail.” TA sits within a range of qualitative analytic approaches which

are concerned with patterns of data, including Discourse Analysis, Grounded Theory, Interpretative Phenomenological Analysis (IPA), and some forms of Narrative Analysis.

In contrast to these approaches, however, TA is characterised by its theoretical flexibility, meaning that it can be applied in a range of different types of research (Braun and Clarke 2006). Thus, versions of TA have been applied in essentialist, constructivist (such as thematic discourse analysis), contextualist (phenomenological and critical realist) research. It has been used to analyse most types of qualitative data, including: interviews (Kitzinger and Willmott 2002), focus groups (Braun 2008), and secondary sources (Farvid and Braun 2006). As a ‘contextualist’ method TA sits between essentialism and constructionism, (Braun and Clarke 2006), and thus relates to critical realist approaches that “acknowledge the ways individuals make meaning of their experience, and, in turn, the ways the broader social context impinges on those meanings, while retaining focus on the material and other limits of ‘reality’” (ibid: 81).

The process described in the following sections was based on Braun and Clarke’s (2006) six phases of TA (see Table 3.1, previous page).

**Table 3.1 - Phases of thematic analysis and section numbers for below discussion (from (Braun and Clarke 2006))**

Phase	Description of the process	Section
1. Familiarizing yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.	-
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.	3.5.1
3. Searching for themes:	Collating ‘codes’ into potential ‘themes’, and ‘domains’ gathering all data relevant to each potential theme.	3.5.2
4. Reviewing themes:	Checking if the ‘themes’ work in relation to the coded extracts (Level 1), the ‘domains’ (Level 2), and the entire data set (Level 3); generating a thematic ‘map’ of the analysis.	
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.	
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.	-



### 3.5.1. Coding

Cross-sectional indexing of data (otherwise known as categorising, coding, assigning nodes, or 'code and retrieve') functions in the same way as the headings and subheadings in the chapters of a book, giving a descriptive sense of what each section of text is about. A sophisticated indexing schema can turn data into a resource which can be accessed in various ways, according to various purposes. The categories focus and organise the *retrieval* of sections of text for the purpose of some further form of analysis or manipulation. Indexing and retrieval procedures are most readily applied to text-based data. They are also a means of getting a systematic overview of the data, providing a clear idea of their coverage and scope. Such approaches further facilitate the location and retrieval of issues, topics, information, examples and themes which do not appear in an orderly or sequential manner in the data (Mason 2002).

The job of indexing and retrieving text is greatly facilitated and enhanced by the use of Computer Assisted Qualitative Data Analysis Software (CAQDAS), which is increasingly used to assist in the organisation and analysis of qualitative data. The software enables the researcher to index data according a large number of categories. Once text is coded by the researcher, fast, comprehensive and complex searches can be undertaken. This assistance with 'mechanical' aspects of the analysis is often said to free up the researcher to concentrate on the conceptual aspects, and can facilitate the analysis of larger amounts of data (Seale 2000). However, it is important to be aware that a simple increase in sample size does not necessarily imply that research findings will be more valid (Kelle 2000). Nevertheless, the functional evolution of CAQDAS from 'code and retrieve' to 'code-based theory building software' has enabled the researcher to test relationships between issues, concepts and themes. For example, it assists with the development of broader or higher order categories, or at the other extreme, more detailed specific codes where certain conditions combine in the data (Lewins and Silver 2007). Furthermore, by making the process more systematic and explicit, the research can be more rigorous and transparent.

This study utilised NVivo (version 10) CAQDAS software, which comprises a range of tools for handling and analysing qualitative data, these include: coding tools, which are used for cross-sectional categorisation of portions of text or other materials; query tools, which can be used to search, explore content and cross-tabulate coding references; annotation tools, including linking and memoing; and visualisation tools, such as mapping or networking (Lewins and Silver 2007). Thus for the data generated by the 'intensive' phase of the research (described above in Section 3.4), research notes, fieldnotes, interview notes, and other relevant materials in digital format were uploaded to the NVivo software for analysis. Equally, for the 'extensive' phase (described below in

Section 3.6), written public comments and PCS Response Statements were uploaded. These different types of data were placed into separate folders.

The codes themselves were created 'inductively', otherwise known as 'open' coding, being identified from salient aspects identified in the data. This differs from a 'deductive' approach, in which codes are assigned according to predefined areas of interest (LeCompte and Schensul 1999). Codes were created for as many potential themes/patterns as possible. However, to ensure that the indexing system is consistent with the core assumptions of the research design, careful thought is required from the start of the coding process as to what kinds of ontological phenomena the categories are an expression of and what kind of knowledge or evidence they constitute (Mason 2002). To do this, indexing categories were produced in relation to three levels of reading: *literal*; *interpretive*; and *reflexive*. Literal codes delineate what the data is descriptively about, or literal points of substance such as 'cultural resources', 'employment', or 'water table'. Interpretive and reflexive codes, by contrast, infer meaningful concepts, relationships, or relations to the broad areas of interest, such as norms and discourses, or researcher positionality (Mason 2002).

Full and equal attention was given to each data item, with the aim of constructing "meaningful patterns of facts" (Jorgensen 1989) by looking for interesting aspects that form structures and themes across the dataset. On the NVivo software, this involved tagging and naming (i.e. 'coding') selections of text within each data item. The names, or codes, created were abbreviated textual codes which were easily identifiable to me. In order to maximise the level of detail, within the time available, as many potential themes and patterns were coded for as possible, staying as close to the written text as possible.

### 3.5.2. Searching for, reviewing, and defining themes

The aim of this stage in the process was to focus the analysis at the broader levels of themes, rather than codes. The process of *searching* for themes began by sorting the different codes into potential themes, thereby collating all the relevant coded data extracts within them (Braun and Clarke). An initial thematic mapping was conducted to visualise the relationship between codes, between themes, and between the different levels of themes. Using these draft maps, a process of *reviewing* the themes, sub-themes and codes commenced. This was carried out with a view to determining whether the schema held as it was, or whether some codes or themes needed to be combined, refined, separated or discarded. As dual criteria for judging categories – internal homogeneity and external heterogeneity – was employed here. Thus, while efforts were made to ensure that data within themes cohered together meaningfully, clear and identifiable distinctions between themes

were also aimed for. This was achieved through a process of reading through the collated extracts for each theme, and ensuring that they form a coherent pattern. Similarly, the extracts were again re-read and reviewed to ensure that the thematic maps were: (a) valid in relation to the entire dataset; and (b) accurately reflective of the meanings evident in the dataset in relation to the theoretical and analytic approach for this research (Braun and Clarke 2006).

This process of re-reading and reviewing was repeated, over multiple iterations, until the coding and themes had been refined and satisfactory thematic map(s) had been devised. This process of refinement involved moving codes and sub-themes which were in the incorrect place. It also entailed jettisoning some codes and themes which may at first have seemed interesting or significant, but may have been incompatible with the aims of the research. In this instance, the above process resulted in thematic scheme with multiple levels, including ‘domains’, themes, and sub-themes, with codes as the bottom level of analysis (see Figure 3.8). The next process of *defining* entailed naming the themes and refining the specifics of each theme towards an overall story of the analysis. Here, by going back to the data extracts for each theme and organising them into a coherent and internally consistent narrative, the aim was to identify the ‘essence’ of each theme and to begin to write a detailed analysis. This analysis, realised in Chapters 4 to 6, is evidenced with data extracts of data to illustrate each theme and is related to the research questions, literature and the wider context of the research.

While the methods described in this section sufficiently describe the approach to the ‘intensive’ data collected as described in Section 3.4, the ‘extensive’ data for this research were addressed using

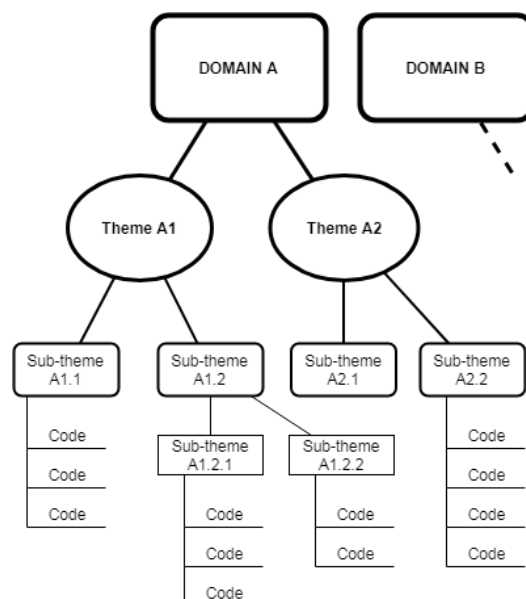


Figure 3.8 - Thematic analysis schema - domains, themes, sub-themes and codes

specific versions of this approach. Used to analyse different forms of data and incorporate quantitative and spatial metrics, these approaches are described in the following section.

### 3.6. Researching ‘extensively’

This section describes the ‘extensive’ phase of the research design, which entailed a desk-based study conducted subsequent to the ‘intensive’ phase. It focuses on the Forest Service’s EIS process for the proposed Rosemont Copper Project. Firstly, Section 3.6.1 describes a ‘Thematic-Spatial Analysis’ of the written comments submitted by the public in response to the Draft EIS. In relation to the themes identified by the latter analysis, Section 3.6.2 describes the process of analysing the institutional responses of the Forest Service to the aforementioned public comments. The ‘Thematic-Spatial Analysis’ allow the question of the nature of competing discourses in relation to the Rosemont mine (RQ1) to be addressed in Chapters 5. Following this, the ‘Theme-Response Analysis’ informed the argument in Chapter 5, which concerns impact of the public comments process upon the NEPA EIS process in substantive, normative ‘democratic’ terms (RQ2).

#### 3.6.1. ‘Thematic-Spatial Analysis’ of public comments

Two characteristics mark out the adapted approach to TA conducted here, relating firstly to the nature of the data analysed, and secondly to the spatial aspect which is central to the aims of this research (RQ1). This is a hybrid, two-stage form of the TA process, which: (1) thematically analyses the themes of concern in the public comments using the same approach described in Section 3.5; and (2) identifies the key issues by quantifying their prevalence in relation to participants’ residential locations.

The Forest Service’s public comments database on the Draft EIS for the proposed Rosemont Copper Project represented a significant dataset, with considerable scope for an extensive analysis of this kind. From over 21,000 participants who had submitted one or more comments, a random sample of 400 was considered an ‘adequate’ sample size to yield as much data as possible while still remaining within the confines of the project time frame (Langevin *et al.* 2012). The submissions of three participants, however, were blank or lost on the software, thus leaving a total sample size of 397 sets of comments. In order to reduce the probability of an unrepresentative sample this sample was stratified. This stratification reflected the relative proportion of comments that were categorised by the Forest Service under PCSs which I interpreted according to their positive, negative or neutral<sup>55</sup> nature. That is, the sample was stratified to ensure that it reflected, as far as possible, the

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<sup>55</sup> Of course, the use of the word ‘neutral’ in this instance is for semantic purposes only, seeing as no individual speaks from a neutral position.

representative proportion of comments whose authors, as implied by the Forest Service's public concern statements, were: (a) explicitly in favour of the Rosemont Copper Project; (b) explicitly opposed to the mine: and (c) expressive of no bias either way.<sup>56</sup>

This sample included only private, individual members of the public who had submitted personal written comments via post or email. Where a person had made more than one submission, all were included for analysis. Transcribed comments made at public meetings and those made via telephone were disregarded. Additionally excluded were submissions by government agencies, NGOs and other organisations or representatives thereof.

After uploading the public comment files to the NVivo (version 10) CAQDAS software and organising them into an appropriate system of folders, the same process of thematic analysis described in Section 3.5 was conducted. First, the process of familiarisation with the data was enhanced by the use of the various tools on the NVivo software. This included running 'word frequency queries' to return rankings of the most frequently referred to terms used by participants. From these it was then possible to 'drill down' to view the use of these terms in the context of the public comments which employ them. It was also possible to identify where certain terms were frequently used in conjunction with others, or relations of other areas of concern. From this it was possible to begin to construct a picture of the values, perceptions and interests held by respondents on the Rosemont issue. This process provided an overview of the breadth and depth of the dataset and the prevalent themes within it, and formed a foundation upon which the proceeding methodological steps rested.

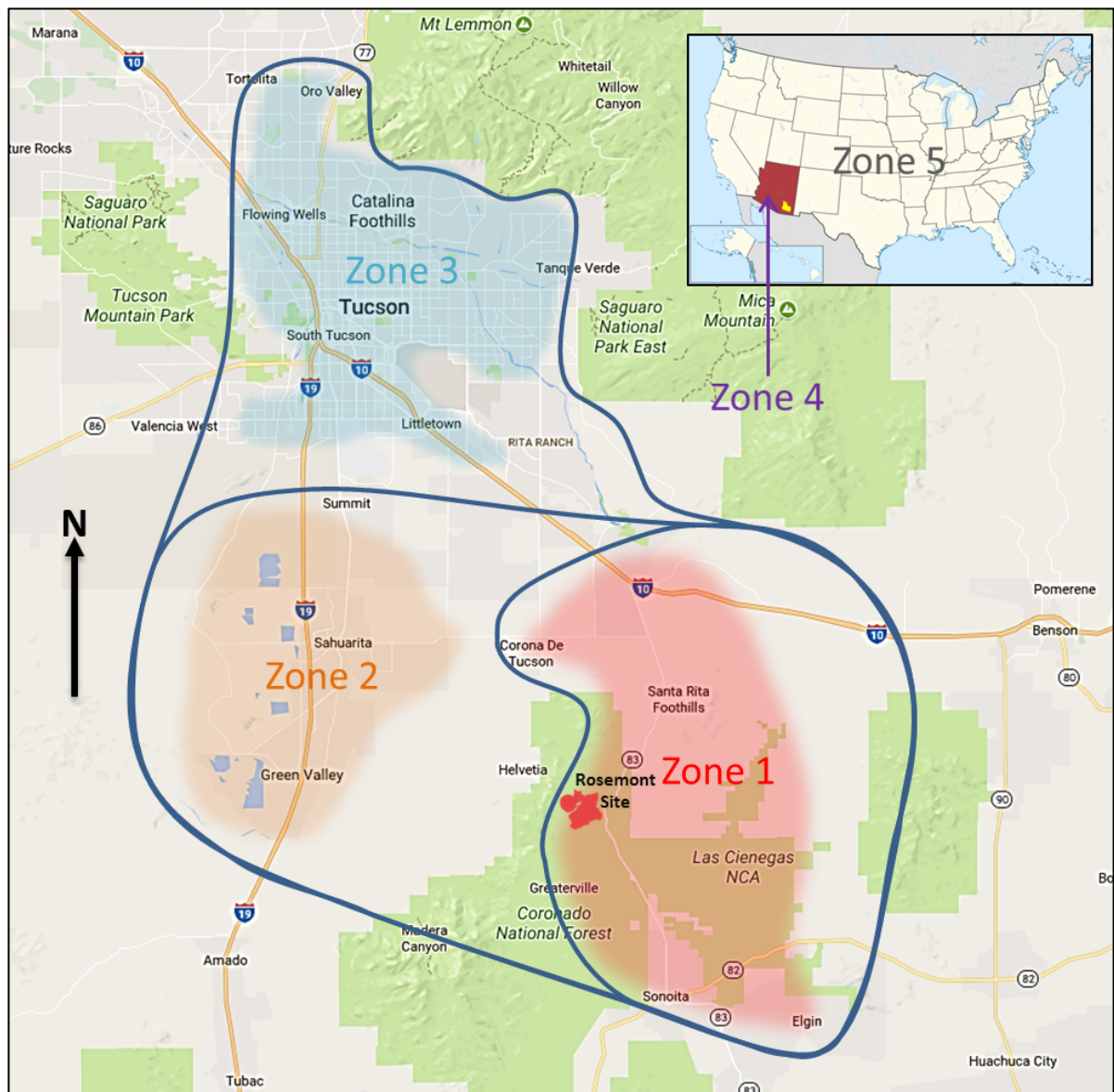
The coding process entailed working systematically through the entire data set using the NVivo software package, inductively applying literal, interpretive and reflexive codes to identify salient portions of text as they were encountered (see Section 3.5.1). After coding, the process of searching for, reviewing, naming and defining themes undertaken (See Section 3.5.2). This resulted in a schema with four levels: codes, sub-themes, themes, and domains. In order to determine the key issues, a quantitative analysis was conducted that essentially tallied the number of participants citing issues coded according to this schema. This was carried out using the various NVivo software 'query' functions to tally the number of respondents who had made reference to a particular topic. After numerous iterations, through which this thematic schema was rationalised and refined, a thematic map was finalised, which clearly displayed the most prevalent domains, themes and subthemes.

Meanwhile, the spatial analysis of the dataset entailed attributing a numerical code which identified the scalar geographical origin of the comments in terms of the participant's residential proximity to

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<sup>56</sup> See Appendix 10.1 for further details of the random stratified sample method.

the proposed Rosemont Copper mine site. By triangulating this information with geographical and political characteristics of the region (see sections 3.4.1 and 3.4.2), six scales of spatial scales of proximity were identified to which the participant’s residential locations were attributed (see Figure 3.9). Combined with the data on the prevalence of the themes identified, the proportions of respondents from a given spatial scale (i.e. of ‘locality’) citing issues pertaining to given theme could be ascertained. Moreover, this analysis could report scalar geographic nature of references to a certain theme. This analysis frames the discussion in Chapter 4, which also incorporates insights



**Figure 3.9 – Map showing delineation of nested geographic scales for respondents’, with shaded area indicating where the majority of respondents resided. Zone 1 is the most proximate scale, covering residents of the Cienega Creek watershed where the Rosemont site is located. Zone 2 includes residents of the Sahuarita and Green Valley urban areas in the upper Santa Cruz Valley. Zone 3 delineates residents of the Tucson metropolitan area. Respondents from the wider state of Arizona are in Zone 4, while the other U.S. states are Zone 5. International respondents, not shown here, are Zone 6. (Source: adapted from Google 2017).**

from the archival research and participant observation to construct a narrative of the nature of competing discourses in relation to the Rosemont mine (RQ1).

### 3.6.2. Theme-response analysis

Having thematically characterised the public comments, the next stage of the extensive research was to analyse the institutional response to those different types of concern. The main objects of analysis here were the PCS Response Statements (PCS'), which were issued by the Forest Service in direct response to the public comments. The PCS' were formulated by the Forest Service following their own 'content analysis' process. This entailed a coding process in which the text of individual comment letters and emails were broken down into "pertinent individual comments" (or 'discrete' comments) (CNF 2009). These discrete comments were disaggregated from the original submissions, categorised according to the area of concern they address, and collated into 316 separate PCS documents. Each PCS contained four elements: (1) a short statement (essentially a long form 'code') summarising the concerns raised in the categorised comments; (2) the Forest Service's written response to these comments; (3) all of the discrete comments which the Forest Service had determined were relevant to that area of interest, attributed to individual respondents; and (4) additional responses addressing more specific concerns.

The aim of the theme-response analysis, the results of which are discussed in Chapter 5, was to characterise the nature of the PCS Response Statements in respect to the themes identified in the Thematic-Spatial Analysis described above. This analysis proceeded in three steps, as described below.

- STEP 1

Code the PCS' according to the coding and thematic schema generated from the public comment submissions as analysed in Section 3.6.1. Those PCS' which did not correspond to these themes were considered outside of the aims of this research and were disregarded.

- STEP 2

Having identified the PCS' which correspond to the public comments/themes pertinent to this research, using the NVivo software the text of the Forest Service's written responses were analysed. This used the same 'approach' described in Section 3.5.1. to identify salient themes, albeit slightly adapted. This entailed looking for signifiers of types of response and coding them accordingly. The focus here was on the identification of salient phrasings and patterns of usage of certain terms or entire phrases and discourses.

Thus, following a process of familiarisation, and the generation of initial codes, an iterative process of numerous cycles of reviewing, refining and defining ‘themes’ under which these codes placed was undertaken. This process entailed a more deductive approach than that described in Section 3.5.1, tailored to the aims of this research. The analysis was thus carried out with a view to categorising the signifiers of different types of response (the codes) and assigning them a code which could be used to describe the data.

- STEP 3

The occurrence of PCS’ responses corresponding to each theme (identified in Step 1) and each type of response (identified in Step 2) were tallied. This data was tabulated to characterise the predominant types of response, and the relationship of these response types to the different themes identified from the public comments.

In answer to RQ2, this analysis informed the discussion in Chapter 5, which also incorporated insights from a review of the changes made to the Final EIS document in respect to the themes identified.

### 3.7. Reflexion: limitations and positionality

#### 3.7.1. In interviewing

Interviews have been described as “co-constructed” (Cloke *et al.* 2004: 129) and in terms of a collaborative project (Crang and Cook 2007). However, the degree to which an interview can be perceived as ‘collaboration’ depends on the interviewer, the interviewee and respective perceptions of the purpose of the interview. When interviewing senior federal agency staff, for example, there were definite boundaries to the direction and scope of the discussion which contradict ideas of collaboration. Despite these limitations, the latter type of interviewee was typically passive in terms of framing the interview. By contrast, on numerous interviews with NGO workers or activists, there was a sense of the interviewer becoming the subject. These respondents wanted to tell me what they thought I ought to know, irrespective of my questions. They often would hand flyers, literature and other paraphernalia, and even invite me to events.

Both of the above-described ‘types’ of interviewee were often curious as to my own affiliations, position and opinion. There often appeared to be a reticence, as though what might be said was a calculation of the potential risks or benefits. McDowell (2010) highlighted how in today’s ‘interview society’, people are increasingly cautious and savvy about being interviewed. Thus a question arises as to how to go about facilitating access, and ensuring an open discussion once access is achieved. If



the researcher feels under some scrutiny about the research aims, to what extent should the purpose of the work be revealed? Rice (2010: 70) recommends exercising “elasticity of positionality” that overlaps and stretches from postgraduate students to experienced academics. For Rice, it is the stretching of this elasticity that can be used to reduce the power differentials between researchers and subjects. Bearing in mind the controversial nature of the case study, and more importantly its ongoing status, I was certain to establish my circumstances and sympathies in a somewhat neutral but honest way when introducing myself. However, I also consciously framed my discourse in certain ways, depending on the interviewee, so as to not arouse any nervousness as to my intentions. Thus, I responded empathetically to mining proponents’ views on the importance of the industry, just as I did to opponents’ values in relation to the environment.

Furthermore, as Elwood and Martin (2000: 649) argued, “the interview site itself produces ‘micro-geographies’ of spatial relations and meaning, where multiple scales of social relations intersect in the research interview.” Consciously or otherwise, respondents construct their identities according to particular spatial contexts, presenting particular aspects of their individual and social identities (Sin 2003). For interviewing elites in their own territory, this may tip the power balance in favour of the respondents (Rice 2010), whereas meeting them for lunch at a café may cause them to be reticent, or not take the interview seriously. Conversely, when interviewing marginalised or minority groups, meeting them in their place of work or home may help to reduce any power deficit to the researcher. Such decisions can have significance for the ‘rapport’ which an interviewer is able to establish with a respondent and hence the depth and meaning of information elicited.

Empathising with the participant was critical in making the initial contact and deciding where to meet for interviews. In choosing a location it is important to consider whether the individual will be nervous or afraid, and how much they know or understand about the work being carried out (McDowell 2010). Nevertheless, sometimes the researcher will not be in control of where an interview takes place, and there were instances of having to ‘work with what I could get’, while being certain to put on record the context in which the encounter took place (Clope *et al.* 2004). Thus a pragmatic and flexible approach was adopted in regard to the location of the interview. As the interviewees were generally employed, often they were too busy to travel to the university, thus the meeting took place in an office or meeting room at their place of work. Where more convenient, or if there was some potential for concern in respect to how their participation might be perceived, the interview was arranged for an off-campus location. This was typically a coffee shop known to be quiet and spacious so as not to be distracted or overheard.

Where possible, a colleague acted as a scribe, leaving the interviewer free to manage the conversation and more able to follow up on emerging lines of questioning. This decision was taken in consideration of the impact the presence of a recording device can sometimes present in creating a psychological barrier to the interviewee, whose responses might be more guarded and 'formal' than if the 'red light' was not still blinking (Cloke *et al.* 2004, McDowell 2010). Where a scribe was not available, a digital recorder was used. However, it became apparent quite quickly that government employees and those who were in opposition to the mine were more likely to appear reticent to the idea of being recorded. Thus a judgement call was made in each case as to whether to introduce the recorder at all. If not, the notes were taken simultaneous to conducting the interview. As noted by (Emerson *et al.* 2011), however, interviewing and note-taking simultaneously poses a challenge for the researcher. And even using a scribe can create problems in terms of ensuring all the information is taken down.

Finally, a note on the process of doing a PhD project in relation to the interviews, which had a limitation which should be acknowledged here. To a significant degree, this was due to the practical and logistical restrictions associated with conducting time-and-finance-limited PhD research overseas. As a result, the research questions used to frame the semi-structured interviews were in a stage of iterative development at the time of the interviews.<sup>57</sup> Despite having been developed further since the interviews, the general aims of the research have remained constant. In triangulation with the other qualitative methods, therefore, it was possible to reframe the interview data to construct a meaningful narrative of the issues surrounding the chosen case study.

### 3.7.2. In thematic analysis

It has been contended that the use of CAQDAS software can alienate the researcher from their data, creating a distance and objectivity which goes against the theoretical and methodological orientations of qualitative research (Kelle 2000). However, it should be emphasised here that as part of a suite of methods in an extensive-intensive research design, the use of CAQDAS is one way to quickly analyse data which can be enriched dialectically by drawing upon other more qualitative approaches. Again, the triangulation of mixed methods employed in this research is critical here.

In respect to claims for 'inductive' coding, and particularly in relation to the definition of themes and domains, it is important to acknowledge that as researchers, we cannot free ourselves entirely of our theoretical and epistemological commitments. It should be emphasised, therefore, that qualitative researchers actually use both induction and deduction throughout their analysis

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<sup>57</sup> See Appendix

(LeCompte and Schensul 1999, Lewins and Silver 2007). Adopting a critical realist perspective, I thus accept that 'reality' exists, but that its interpretation is subjective. Before and throughout the process, a researcher is sensitised to specific elements of the data set by the ontological and epistemological frames of my research. The themes and domains such as socioecological and socioeconomic are therefore not 'given' to this research but are internal to it, and the interpretive discussions in the following chapters should be viewed in this light. Within a different context, at a different moment, and in different hands, the analyses conducted here may have produced a set of categorisations of a completely different order. Moreover, themes which were omitted from the analysis for the purpose of retaining a focus on the research aims – such as traditional/cultural values of local tribal groups – may have been afforded more (and much needed) empirical attention. I thus make no claims as to the generalisability of my findings, but maintain, following Flyvbjerg (2006) and others that, in relation to the aims of this research, they contribute to a wider body of *meso*- and *macro*-level geographical knowledge.

### 3.8. Ethics

In line with university guidelines, to enable interview participants to make an informed decision on whether or not to take part, participant information sheets were sent to participants in advance of any meetings via email.<sup>59</sup> These sheets clearly and simply detailed the nature of the study, what can be expected in terms of questions, and my approach to the meeting. Expressions of informed consent were obtained prior to the interview. Participant consent forms were sent by email along with participant information sheets during initial introduction and negotiation of meeting/interview times. Respondents were asked to sign the consent forms prior to commencing the interview. The forms were retained as proof of informed consent.<sup>60</sup> Informants were also be periodically reminded of their right to withdraw from the study at any time up to publication of the research, and that in such an event the information provided in respective interview(s) would be destroyed and not used in the research project. This was made clear from the outset by ensuring that the informants complete the interview consent form.

In order to maintain respondent anonymity, each was allocated a unique alpha-numeric identifier. Arrangements were made for personal information to be stored separately to that provided in interviews. Notes from each interview were provided to participants for review, whereupon they were given the opportunity to challenge and amend information on record or withdraw from the

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<sup>59</sup> See Appendix 19.1

<sup>60</sup> See Appendix 19

study. Participants' personal data and the information provided during the interview was stored on password-protected computers/hard drives. After the end of the research, these materials will be archived in accordance with RCUK guidance.

The research examines the intentional and (especially) the unintentional (because proceeding from structuration) power plays with respect to official EIA for a proposed copper mine. Therefore, there are potential risks to participants arising from: the interpretation of personal information by the researcher; its inadvertent exposure to the public domain; and the potential psychological, social, economic and physical consequences to the respondent. While the measures explained above go some way to mitigating these risks, there remains an ineluctable residual risk, and this was communicated to respondents in the participant information sheet. The practice of this research has adopted a reflexive and sensitive moral approach which respects rights to autonomy, self-determination and the avoidance of harm or violence (Mason 2002). As McDowell (2010: 162) states, the aim will be to:

“construct an encounter in which the exchange is both sufficiently collaborative to make the 'respondents' feel comfortable and that their participation is highly valued while at the same time not being overly intrusive or too focused on the interviewer's own life, values and beliefs [...] creating both greater empathy and attempting to reduce the power differentials in the actual encounter.”

### 3.9. Conclusion

This chapter has described the methods and approaches adopted in order to address the research aims, making reference to the specific research questions identified in Chapter 1. In Section 3.1, a rationale was given for the use of a single case as the object of study and the selection of the proposed Rosemont Copper Project as a 'hot situation', which I was uniquely positioned to investigate. I argued that, conducted with appropriate rigour, the use of such an example offers considerable scope to contribute to wider perspectives on the relationship between power, science, policy and the democratisation of environmental governance.

A brief discussion to the history of the Helvetia-Rosemont mining district, including the emergence of opposition to previous iterations of proposal to mine the Rosemont site, provided the background to the current proposal. The plan of operations submitted to the Forest Service by Rosemont Copper was summarised, including details of the significant material implications for the mine site and the water requirements for the operation. This was followed by a description of the existing physical and social geographical characteristics of the area. The geo-hydrological characteristics of the Cienega

Creek watershed were described, with an emphasis on the critical relationship between water and the presence of regionally rare riparian and aquatic habitats and endangered species.

An outline of the NEPA EIS process that commenced following the submission of the MPO to the Forest Service, including a timeline of the key events and various arrangements for public involvement, was described. This includes the public commenting process on the Draft EIS, which provided the extensive database for the Thematic-Spatial Analysis of public comments described in Chapter 4. In addition, the PCS responses to these public comments were introduced as the basis for the analysis in Chapter 5.

Section 3.2 discussed the broadly defined critical realist framework for the research. This epistemological position was contrasted with positivist and constructivist perspectives, situating it between the two. The overall research design, outlined in Section 3.3, frames a mixed methods approach in terms of 'intensive' and 'extensive' data collection techniques and thematic analysis. The relative flexibility of this approach was emphasised, highlighting that it permitted the triangulation of a number of methods towards the aims of the thesis.

Section 3.4 detailed the 'intensive' phase of the research, focusing on the qualitative data collection methods employed during the field-based research. First, I described a process of immersion in the official and unofficial archive of literatures, media and artefacts. Next, I related the practice of participant-observation, which was undertaken opportunistically at various events during the time in the field. The processes of recording insights, through headnotes, fieldnotes and other media, were detailed. Through these practices of archival and participant-observation, a contextual background to the case study specifically and broader issues surrounding it was built up. This qualitative information was significant in informing and framing the subsequent approaches to the research, and in adding richness and nuance to the narratives in this thesis.

Interviewing, as the primary intensive research strategy, was introduced in Section 3.4.3. The methodological processes for the in-depth interviews in the semi-structured format was described, including the recruiting of 25 key informants, and the approach to organising, executing and recording the interviews. In Section 3.5, the approach to analysing the data obtained through the interviews was set out. It was argued that the Thematic Analysis offers the theoretical flexibility to be employed effectively within a critical realist framework. This was followed by an explanation of the procedure for Thematic Analysis. Cross-sectional coding of data was carried out using NVivo CAQDAS software. This was followed by a process of searching for, reviewing, refining, naming and

defining the 'themes' emerging from the interviews. Thematic maps were produced, which informed the narrative in response to RQ3.

Section 3.6 described the 'extensive' research phase, which focused on characterising the thematic nature of public discourse in relation to the proposed Rosemont mine, and the subsequent responses of the Forest Service through the EIS process. Firstly, a 'Thematic-Spatial Analysis' of public comments on the Draft EIS identified the key issues of concern and related them to six geographic scales of proximity in respect to the mine site. While this process entailed the same process of TA explained in Section 3.5, the analysis was extended by quantifying the number of participants from each scale each citing issues pertaining to the themes identified. The results of this analysis, discussed in Chapter 4, address RQ1. Secondly, a 'Theme-Response Analysis' focused on the PCS statements issues in response to the aforementioned themes. The responses categorising the signifiers of different types of response (the codes) and assigning them to themes corresponding to an implicitly normative scale. This data was tabulated to characterise the predominant types of response, and the relationship of these response types to the different themes identified from the public comments. In answer to RQ2, this analysis informs the discussion in Chapter 5, which also incorporates insights from a review of the changes made to the Final EIS document in respect to the themes identified.

Finally, in Sections 3.7 and 3.8 I reflected on the research process, its limitations, and addressed issues of positionality and ethics in interviewing and thematic analysis.

# **4. Participatory spaces: public engagement in the Rosemont EIS process**

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Responding to RQ1, the aim of this chapter is to characterise the nature of public perceptions in relation to geographic scales, through a Thematic-Spatial Analysis (as described in Chapter 3) of the public comments on the Forest Service's Draft EIS. The chapter thus begins by describing public comment data set from the NEPA EIS process for the proposed Rosemont Copper Project in respect to the respondents whose submissions were thematically analysed. This initial analysis highlights the relationship between expressions of support or opposition to the Rosemont Project and residential location at six scales of proximity – from 'local' to 'global' – to the proposed mine site. Having characterised the nature of debate in the latter respect, the chapter goes on to introduce themes identified from the written comments submitted by the public and the analysis of their prevalence among the respondents in respect to the six geographic scales.

The results confirm the highly contested nature of the Rosemont matter, with themes emerging from the public comments pertaining to two primary domains: the *socioecological* and the *socioeconomic*. Concerns relating to water and water resources are equally prominent, with issues around water quantity and quality cutting across the aforementioned themes. For these respondents, among whom there is a greater proportional tendency – in comparison to those citing socio-economic benefits – to oppose the project and be resident closer to the proposed mine site, links between adverse and irreversible impacts to water, ecology, culture and local economies are central to their arguments. On the other hand, proponents, who are predominantly resident in Tucson, contend that those adverse impacts not mitigated or minimised through techno-scientific measures would be outweighed by the socioeconomic benefits.

Focussing first on the socioeconomic domain, Sections 4.2 and 4.3 respectively describe the competing positive and negative economic arguments in respect to the Rosemont Copper project. Here, opposing perspectives converge on the same objects, with claims for 'new' revenues and employment benefits contrasting with concerns for 'existing' local economies. Section 4.4 then discusses the predominant themes in relation to the potential adverse socioecological impacts of the mine. Implied here are the material impacts to the human environment, its ecological functioning, and its social and cultural relationship to humans. Considering the co-contingent nature of water, socioecological and socioeconomic values, a narrative thread relating to the former domain runs through the discussions of the latter two (i.e. rather than considering 'water' as a thematic domain in isolation).

#### 4.1. Thematic-Spatial Analysis



This section describes the results of the initial stage of the Thematic-Spatial Analysis conducted on the public comments on the Draft EIS for the proposed Rosemont Copper Project. It first highlights the expressed opinions of those who made submissions in respect to approval or disapproval of the mine, and relates these positions to their residential location in respect to the proposed mine site. Second, the themes identified through the Thematic-Spatial Analysis described in Chapter 3 are introduced. The results showing the prevalence of these themes in respect to the geographic scales at which those expressing them were residing frame the detailed discussions in the remainder of the chapter.

#### 4.1.1. Expressed public positions on the proposed Rosemont Copper Project

Out of the 397 public respondents whose written submissions were randomly selected for this analysis, 17% were residents of the most 'local' scale in relation to the proposed mine site, the Cienega Creek Watershed (delineated as Zone 1, see Figure 3.9 and 4.1-b). The headwaters of Cienega Creek, on the eastern flank of the Santa Rita Mountains, coincide with the planned location of the copper mine. It is here that many of the most direct material impacts of the Rosemont project would be felt. At the next scale of proximity are residents of the upper Santa Cruz Valley (Zone 2) to the west of the Santa Rita range, including communities of Green Valley and Sahuarita. This area – which is underlain by the Upper Santa Cruz Aquifer, from where the mining operation would draw its water supply – accounted for 15% of respondents. The third zone in relation to the mine site is the city of Tucson (Zone 3), thirty miles to the north-west, residents of which represented 52% of those analysed – making them the largest group of respondents. Meanwhile, 8% of respondents resided in the wider state of Arizona – that being any location outside of Zones 1-3 but inside the state lines (Zone 4); 7% sent their comments from outside the state of Arizona but within the continental United States (Zone 5); and one respondent was from overseas (Zone 6).

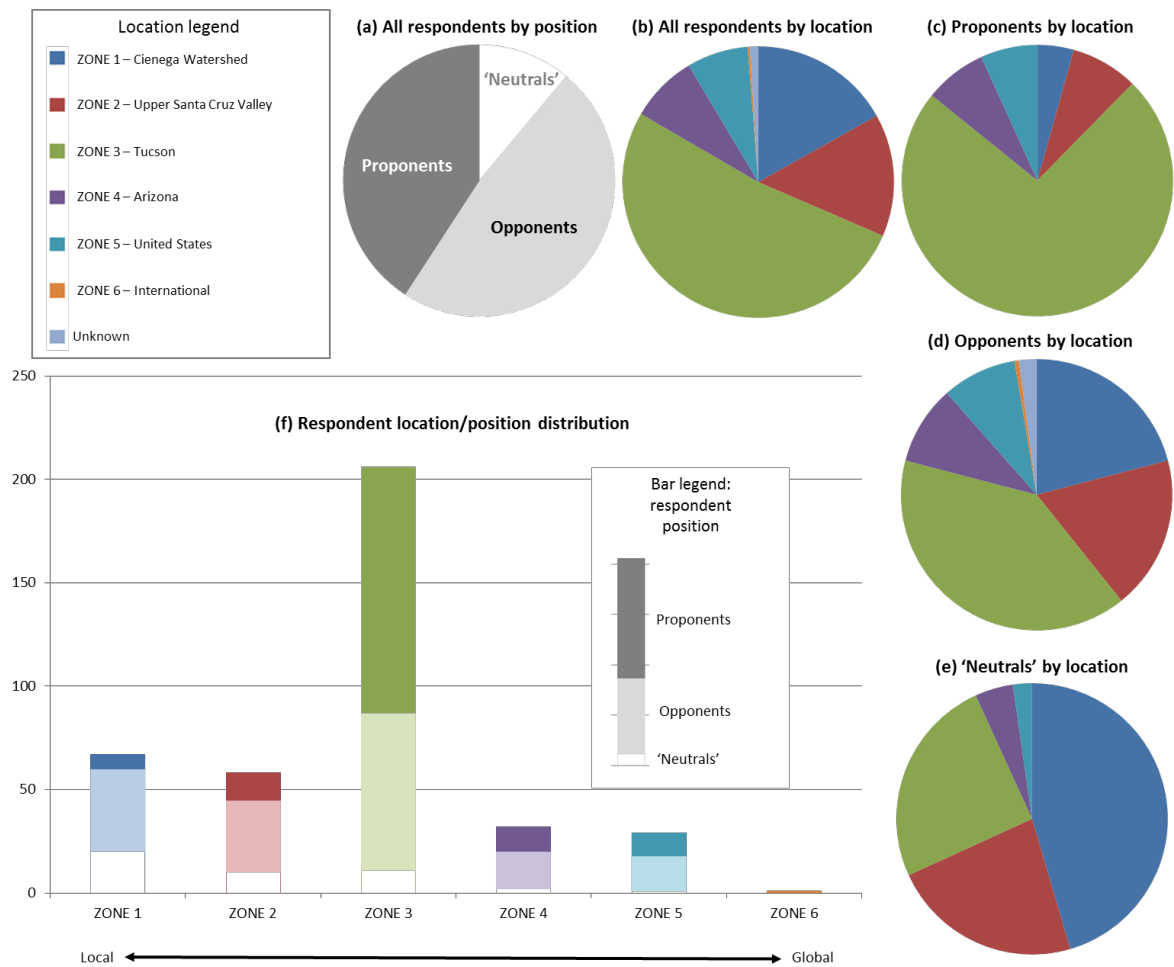
In terms of the positions of the respondents in terms of their general approval or disapproval of the proposed mine, 41% explicitly stated their support on one or more occasions in their submitted comments on the Draft EIS, while 48% were overtly opposed to the mine. Meanwhile, a further 11% made no direct expression of support or opposition for the proposal (see figure 4.1-a).<sup>80</sup>

Geographically, 40% of opponents were residents of the major metropolitan area of Tucson (Zone 3). Opponents listed their location within the most adjacent area to the mine site constituted 21% of the respondents whose comments were analysed (Zone 1). A total of 18% hailed from the opposite

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<sup>80</sup> However, of these ostensibly non-partisan respondents, it is notable that 80% included statements to the effect that the draft EIS had made omissions or was inadequate in some respect.

flank of the Santa Ritas, in the upper Santa Cruz Valley (Zone 2). Meanwhile, supporters of the mine were overwhelmingly located in Tucson, with 73% from Zone 3 (see figure 4.1-c). Those whose comments suggested neither support nor opposition to the mine primarily resided in Zone 1 (45%). Thus, as figure 4.1 shows, the modal group in respect to geographic location were proponents residing in the Tucson metropolitan area. The second-ranked group were opponents who were also residents of the city, while the third and fourth-ranked groups were those opponents located in the Cienega Basin and the Upper Santa Cruz Valley respectively.



**Figure 4.1 - Overview of respondents by position on the proposed Rosemont Copper Project and residential location: (a) 'All respondents by position', showing proportion making explicit statements of support (proponents), opposition (opponents), or neither ('neutrals'); (b) 'All respondents by location', showing proportion of all respondents residing in geographic zones 1-6 (see legend and map Figure 3.9); (c) 'Proponents by location', showing proportion of proponents residing in geographic zones 1-6; (d) 'Opponents by location', showing proportion of opponents residing in geographic zones 1-6; (e) "'Neutrals' by location', showing proportion of respondents residing in geographic zones 1-6 with no stated position; and (f) 'Respondent location/position distribution', showing proportions of proponents, opponents and 'neutral' respondents residing in geographic zones 1-6.**

Thus, while public opinion on the Rosemont mine debate was finely balanced in broad terms of approval or disapproval, the geographic profiles of these juxtaposed groups displayed considerable variation in views. The metropolitan population were the largest group of participants in geographic

terms, and constituted the largest proportion of respondents in both the proponent and opponent camps. Nevertheless, the geographic difference between the support and opposition to the project consists in the more local nature of the latter. Furthermore, the modal groups at the two most local geographic scales were overwhelmingly opposed to the project; while there was less significant majority of proponents in Tucson. Those who made no direct assertion of consent or dissent, meanwhile, were primarily residents of the Cienega Creek watershed (Zone 1). However, it should be noted that a large proportion of this latter group made critical statements in their comments, relating primarily to the potential adverse impacts of the mine and questions over the rigor of the scientific analyses in the Draft EIS.

#### 4.1.2. Themes identified in the public comments

Figure 4.2 identifies the three interrelated thematic domains, which emerged from this analysis: *socioeconomic*; *socioecological*; and *water*; to each of which correspond a range of themes and sub-themes. As the thematic schema implies, while the nature of potential impacts to water emerged as a prominent theme in the material sense (i.e. quantity and quality), it is discursively inextricable from the socioecological and socioeconomic relations which are contingent upon water.

The prevalence of these themes, in terms of the number of participants residing at the various geographic scales citing issues pertaining to each, is shown in Table 4.1. At the level of domains, the analysis highlights comparable proportions of participants citing issues relating to the positive socioeconomic impacts, the negative socioeconomic impacts, and the socioecological impacts of the mine. By comparison, water can be seen to be the most prevalent thematic domain cited in the public comments, being central to many of the socioecological and socioeconomic issues. Within these domains, a number of thematic-spatial patterns can be identified. These patterns are the subject of discussion in the following sections, where the key issues are outlined along with examples from the public comments.

**Table 4.1 – Public comments on the Draft EIS for the Rosemont Copper Project: Thematic-Spatial Analysis**

Domain <sup>1</sup>	% Total/ Domain	Theme <sup>2</sup>	% Total/ Theme	% Respondents/Zone <sup>3</sup>					% Repondents/Theme:Zone <sup>4</sup>					% Repondents/Zone:Theme <sup>5</sup>				
				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Water	54	Water Quantity	44	12	7	16	4	3	27	17	37	10	7	70	50	31	53	45
		Water Quality	36	9	6	14	3	3	24	18	39	8	9	51	43	27	34	45
		General/other	12	4	3	4	0	2	31	23	33	0	13	22	19	8	0	21
		% Total/Zone		14	9	21	5	4	26	17	38	9	7	84	64	40	59	52
Socioeconomic (negative)	46	Existing Revenues	33	8	7	11	3	4	24	21	34	10	11	48	47	21	41	52
		Economic Sovereignty	17	4	4	6	1	1	22	25	34	6	7	22	29	11	13	17
		Environmental > Economic	15	4	2	8	1	1	25	15	49	7	5	22	16	15	13	10
		Property	14	7	3	4	1	0	46	23	25	4	2	39	22	7	6	3
		Existing Employment	13	5	3	4	1	0	36	26	30	6	0	27	22	7	9	0
		Boom-Bust	4	2	1	1	0	1	47	18	24	0	12	12	5	2	0	7
		General/Other	12	5	1	4	0	2	40	11	34	0	15	28	9	8	0	24
		% Total/Zone		13	9	15	4	4	29	20	32	8	9	79	62	28	47	59
Socioecological	43	Ecological	34	8	5	13	3	4	23	14	40	10	12	46	31	26	41	55
		Cultural	11	3	2	4	1	0	29	19	38	12	0	18	14	8	16	0
		General/other	20	4	4	9	1	2	21	21	43	6	8	25	29	17	16	21
		% Total/Zone		10	7	17	4	4	22	16	40	9	10	57	48	33	47	59
Socioeconomic (positive)	41	New Employment	38	1	3	28	3	3	2	9	73	9	7	4	22	53	41	38
		Economic > Environmental	33	2	3	23	3	3	5	8	69	9	8	10	17	44	38	38
		Economic Crisis	25	1	2	20	1	1	3	9	79	4	5	4	16	39	13	17
		New Revenues	25	1	3	19	2	1	3	10	77	7	3	4	17	36	22	10
		Copper Resource Utility	18	1	2	12	1	3	4	9	67	4	16	4	10	23	9	38
		Economic Sovereignty	10	1	1	8	0	1	5	5	75	3	13	3	3	15	3	17
		General/Other	20	1	2	13	2	3	5	9	65	9	12	6	12	26	22	34
		% Total/Zone		2	4	29	3	3	4	9	72	8	7	10	24	57	41	41

<sup>1</sup> % of total respondents citing themes pertaining to each thematic domain.

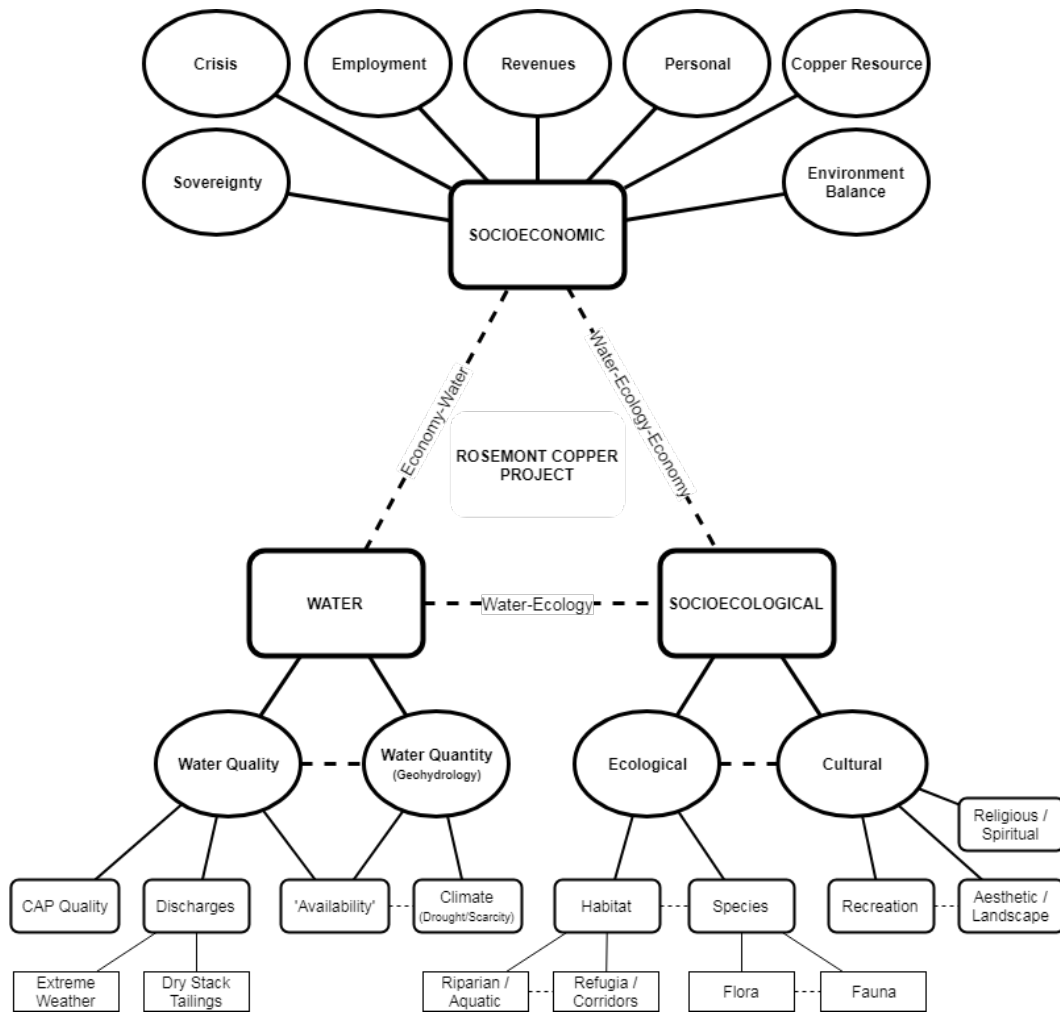
<sup>2</sup> % of total respondents citing issues relating to each theme.

<sup>3</sup> % of total respondents at each geographic scale citing issues relating to each theme.

<sup>4</sup> % of respondents citing issues relating to each theme resident at each geographic scale.

<sup>5</sup> % of respondents as each geographic scale citing issues relating to each theme.

General: shading scales relative to highest and lowest values in each colour. Red = Domain Totals; Purple = Theme Totals; Green = Themes:Zone & Zones:Theme; Orange: Zones Totals



**Figure 4.2 – Public comments on the Draft EIS for the Rosemont Copper Project: thematic map**

#### 4.2. Socioeconomic development

A total of 41% of public participants cited issues relating to the socioeconomic benefits of the Rosemont Copper Project, making this thematic domain marginally less prevalent in the public comments in comparison to economic and environmental counter-arguments. The geographic pattern of themes in relation to the proposed mine is at its starkest in relation to the positive socioeconomic impacts. The analysis shows the extent to which residents of Tucson were particularly occupied by this area of concern; while outside of the city, socioeconomic benefits were comparatively insignificant. Almost one-third of all members of the public submitting comments were residents of the city who mentioned the positive economic effects that approval of the project would bring. Indeed, of all participants from the city, more than half made representations pertaining the positive socioeconomic themes identified here. In this section, I discuss the relative prevalence and discursive content of these comments, which includes claims for the distribution of both economic and subsequent social benefits, in both the material and cultural sense.

#### 4.2.1. Employment

The most prominent positive socioeconomic argument was that of 'employment'. Within the comments in this category, a number of more specific assertions can be seen to have been made in support of the employment argument, exemplified by the below extracts. These include claims for the benefits arising out of the number of jobs that would be created, often distinguishing between those generated by the construction phase of the project, permanent positions of direct employment with the mining company, and those generated within secondary and tertiary industries in the area. The 20-year duration of the mining operations is frequently cited as a benefit in terms of 'job security'. Meanwhile, respondents repeatedly argue in favour of the relatively high salaries (\$59,000-\$60,000) that they assert would be earned by the directly employed workforce.

[T]his mine will provide employment opportunities to hardworking Arizonians...create hundreds of new, high salary jobs right here in Arizona...Thousands of other jobs will be supported (Respondent 0017).

Rosemont Copper has proposed building a new mine that will yield enough copper to keep it operational for twenty years while employing hundreds of people. (Respondent 0092).

Rosemont is committed to a sustainable economy by creating up to 2,100 jobs during the construction phase and nearly 500 permanent jobs thereafter. With mining jobs averaging an annual salary of \$59,000 a year, these are the type of jobs that are needed for local business to flourish (Respondent 0129).

#### 4.2.2. Economic crisis

The employment argument was frequently rationalised in conjunction with a number of other assertions. References to 'economic crisis' were found in the comments of 39% of proponents residing in Tucson. Such comments were repeatedly made alongside references to employment, often citing their impacts upon local communities. Of the 109 proponents from Tucson citing the employment benefits of the mine, 78% also mentioned economic difficulties, particularly since the global financial crisis of 2008. Other than general references to the economic benefits, references to the projects potential for ameliorating the effects of perceived ongoing economic crises were the second most frequent specific economic benefit of the mine cited by the 397 respondents.

I am a retired banker, and I know how important job and business growth are to our economy, especially if we ever hope to get beyond the effects of this recession...These are benefits we simply can't ignore at a time like this. (Resp. 0058)

#### 4.2.3. Revenues

Supporters of the project highlight the revenues that would be generated by the project in the form of corporation tax and income tax. These revenues, argue 36% of proponents from Tucson, will benefit the community by funding schools, emergency services, healthcare, road maintenance and other public services which, it is often added, have been subject to cut-backs due to the recent economic crisis. Proponents contend, moreover, that the negative economic impacts felt outside of the mining industry will be mitigated by the utilisation of technologies that reduce the project's environmental impact. For example, they point to efforts to minimise the light pollution that would affect the astronomy industry, or the use of reclamation techniques that reduce the visual impact of the mine. Words and phrases such as 'modern', 'next generation', 'sustainable' mining practices and technologies, emerge as environmental counter-arguments for the proposed project, strongly reflecting those promoted by the mining company through a media public relations effort<sup>81</sup>.

#### 4.2.4. Environmental balance

Most of the socioeconomic arguments put forward in favour of the mine project reflect a need to address a perceived imbalance: towards or away from certain economic interests; and between interests of an economic and non-economic nature. For 44% of Tucsonian proponents for the mine, the negative environmental risks of the project would be adequately mitigated, and would in any case be outweighed by the economic benefits. Thus, in citing the number of jobs and revenues generated by the project, supporters reject arguments that this opportunity should be ceded due to values for the environment (including particular species) as idealistic and unrealistic in the face of the economic needs of the region. Many of these respondents do emphasise their own values for the environment, but these are rationalised within pragmatic bounds.

#### 4.2.5. Copper utility

Nevertheless, a common argument among proponents was to point to the importance of copper to the everyday lives of those who oppose the mine. They list copper's uses, more specifically citing its importance as a resource to the defence industry and, in a curious inversion of the environmental argument, to the development of renewable energy sources. For 23% of Tucson residents, the Rosemont copper resources should be developed to benefit the people of southern Arizona.

How do we tell 2100 unemployed, able-bodied citizens that they cannot support their families because the EPA had determined [sic] that a lizard, a frog

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<sup>81</sup> See Appendix 13.1

and a minnow may lose a bit of habitat. Where is the balance? A decision to delay the Rosemont mine is utter unsanity [sic] (Resp. 0141).

I understand that our environment [sic] is important to us but we should not let it consume our life. I believe that the impact the mine would have is minimal when compared to our economic decline (Resp. 0078).

We have mines all over this part of the state, and every one of them for better or worse are creating jobs [...] Some of them use a lot of water or have high emissions, and I can see why people are concerned that another mine like that would be bad for the area [...] I like the outdoors as much as anyone else and I want to see them protected, but with even the roads in poor condition and the other mines around here polluting, I think Rosemont's plan will actually be better for us than what we already have. First of all, they have a plan for protecting our groundwater, and I like that a lot. Rosemont's new mine will use new technology, and only half the water that other mines around here use. Their emissions will also be lower than the other mines in the area. We need a company like Rosemont around here to show the others how it is done right. If we encourage this environmentally responsible kind of mining, then other companies will get the message that we care about our area (Resp. 0034).

Opponents of this mine should try to eliminate copper from their lives; they can't do it! (Resp. 0036).

#### 4.2.6. Sovereignty

Implying a loss of control over their economic and cultural 'sovereignty,' proponents call attention to the revenues and the number of jobs which have been lost to overseas producers in recent times, both generally and in mining and copper mining specifically. They decry the closure of mines, the decommissioning of smelters and particularly the country's increasing reliance upon importing copper from foreign countries. Frequently, China, with its growing influence in global economic flows, is the object of antipathy, the competitor to whom Americans are losing out.

Right now, we need so much of it nationally that we get a third of it from abroad. I think we should be producing copper here if we have it. Buying copper from here will support jobs here, and provide money for economic growth (Resp. 0004).

Why would we import copper from other countries if we could get it here at home? Even better, unlike manufacturing or construction jobs, the mine can't leave the state and take its economic benefits with it. The Rosemont mine will principally benefit the citizens of Arizona (Resp. 0049).

It is needed for our manufacturing industry to compete with China (Resp. 0105).



Again, these losses are often related to perceived economic crises and the plight of the Arizonan worker. Once more they point to the hypocrisy of the environmentalist, who demands the material and economic benefits of copper, but cries “not in my back yard” when a mine is proposed. Yet, advocates ask, where, if not here in Arizona, should copper resources be exploited? In China or the South American countries? For a considerable number of respondents, these are the nations to whom mining revenues are being lost and where, paradoxically, environmental regulations are less stringent and mines more destructive. For many proponents, moreover, Arizona is the ‘Copper State’, and mining was instrumental in the state’s establishment. As one of the ‘Five C’s’<sup>82</sup>, copper forms part of a regional identity, a shared heritage that predates the environmental movement. As evidence of its importance, they point to Arizona’s historic contribution to U.S. copper production, and the U.S. contribution to the global copper market, promoting the preservation of the industry as a matter of civic and patriotic pride.

If successful, their techniques could revolutionize the way one of the five "C"s of Arizona is produced and bring an industry that is mostly still operating with mid-twentieth century methods into the new millennium (Resp. 0079).

[C]opper mining has been fundamental to Arizona's economy - and identity - since the very beginning. We are the Copper State, after all. I know that the industry has provided important jobs for thousands of families like mine, and I would like to see this continue with Rosemont's copper mine (Resp. 0066).

We are a copper state; the seal of our state is a rock with a pitch fork. This is a positive thing for our region (Resp. 0332).

#### 4.3. Socioeconomic decline

By contrast to the geographic pattern of respondents citing socioeconomic benefits of the Rosemont mine, concern for the potential negative impacts is characterised by a shift toward communities closer to the proposed mine site. Nevertheless, residents of Tucson are strongly represented, contributing almost a third of submissions which referred to this thematic domain. Most of the remainder of comments in this respect were submitted by people from the Upper Santa Cruz Valley or the Cienega Creek Watershed (Zone 2 or Zone 1), with the latter contributing the most submissions on this subject. However, as a proportion of total representation each geographic scale, these issues are relatively insignificant for people in the city. Almost 80% of residents from the Cienega Creek watershed, in the shadow of the mine site, cited concerns socioeconomic impacts. Two-thirds of people from the upper Santa Cruz valley, meanwhile, cited similar concerns. However,

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<sup>82</sup> The Five C’s - Copper, Cattle, Cotton, Citrus, and Climate - were touted as the pillars of Arizona’s early economy.

it is also significant that these issues were cited by respondents from further afield, in the wider state of Arizona and beyond.

#### 4.3.1. Revenues

The single most prevalent theme among local opposition to the RCP relates to the impact of the imposition of an open-pit mine upon the established economic activities in the area and the revenues it generates. Such concerns were cited by one third of respondents from all geographic scales, but almost 80% of the respondents making such comments were from Zones 1, 2 or 3. However, these concerns were most prevalent for those respondents resident outside of the city of Tucson. While 21% of those from the city cited concerns for existing revenue streams, the matter was a far greater significance for people from the Cienega Creek Watershed, the upper Santa Cruz Valley, the wider state of Arizona and the wider United States, of whom between 41% and 52% mentioned the issue in their comments.

Of primary concern is the potential effect upon the area's attractiveness as a leisure destination, and the subsequent impact to those employers which exist to serve tourists and recreationalists. As well as the Santa Rita Mountains and the Coronado National Forest, there are a number of other designated areas which are a draw for visitors to the area, including the Las Cienegas National Conservation Area and Cienega Creek Natural Preserve<sup>83</sup>. The excavated mine pit would act as a hydraulic sink, causing groundwater drawdown in the surrounding landscape. Thus, the qualities of the biophysical environment which are so valued by conservationists and visitors to the area are threatened not only by the direct physical footprint of the mine site, but also by its impacts to the downstream water flows and qualities that maintain the ecosystems in these places. The potential for declines in visitor numbers further implicates local service and hospitality industries in nearby towns such as Sonoita and Patagonia.

Residents, tourists, and taxpayers would also be negatively affected. The economies of communities in this region are largely driven by outdoor recreation and tourism (Resp. 0164).

There are thousands of "birders," and other nature lovers, who come to this area from all over the country just to see these birds, and they add a large amount of money to our local economy. These ecological tourists spend money for places to stay, restaurants, equipment, and it is all spent locally. They do not defile and destroy our beautiful land while they are here, which makes them much more valuable to us (Resp. 0298).

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<sup>83</sup> Both of these designated wildlife conservation areas lie along Cienega Creek, which, being immediately downstream of the proposed mine site, would be impacted by the consequent hydrological changes.

It is simply bizarre that the DEIS is admittedly omitting assessment of this mine's impact on tourism [...] Then what is the point of an EIS if such crucial issuers are ignored? (Resp. 0290).

#### 4.3.2. Employment

The potential for adverse impacts to local employment is prominent in the comments in the socioeconomic domain. References to this theme are the most prevalent (at 27%) among respondents from the Cienega Creek watershed (Zone 1). Opponents take a different perspective on the number of jobs that would be generated by the RCP. While the RCP's urban advocates positively emphasise the quantity of direct and indirect positions that would be generated as of benefit to the area, its more rural – and local – opponents juxtapose what they see as an insignificant number of jobs created against those that would be lost due to adverse impacts to other established industries in the region. In particular, the imposition of a mine in the landscape undermines the basis for existing tourist and recreational industries upon which many local livelihoods depend. For opponents, therefore, this stands in direct contradiction to positive socioeconomic claims for the number of jobs that would be created.

The jobs will be few and short-term relative to the jobs that will be lost in the tourism industry. [...] All of this for an estimated 400 jobs...and that's only if the price of copper is sufficient to operate the mine, which no one can predict (Resp. 0368).

I have been to several public meetings, and I hear the slogan of how the Rosemont Mine will create jobs. This is just a small part of the picture! Unfortunately, those few jobs created would result in the loss of many other jobs in other sectors of the economy – especially tourism (Resp. 0374).

Over 1,000 jobs depend on tourists to the area (Resp. 0179).

The number of jobs that will be lost in our area must be considered and compared against the job gains claimed by Rosemont (Resp. 0185).

We are concerned that we will see a large reduction in the number of guest nights each year, which would lead to loss of jobs for those employed by Circle Z Ranch (Resp. 0339).

According to the latter views, the negative impacts to jobs in existing local economic activities would thus not, as proponents claim, be mitigated by those created, but would be in exchange for a less significant number of jobs, the duration of which would be limited to the 20-year duration of the mining operation, which would itself be subject to fluctuation in global copper markets. Opponents further contend that the positions created would not be filled by local people. Specifically, they cite

concerns that a high proportion of the jobs would be higher-level positions taken by existing employees of the mining company. For a significant number of opponents from the area citing socioeconomic concerns relating to employment, therefore, the 'foreign' nature of the applicant mining company is particular point of contention. In this instance, the opposition is extended to 'foreign' employees, relocated to the area, who would themselves symbolise the loss of local jobs in tourism, recreation, ranching and so on.

Most jobs would be filled by top level people that the company would bring with them anyway (Resp. 0214).

[T]he jobs created are so specialized that few in the local area would qualify for them (Resp. 0220).

Jobs will be created, but for whom and for how long? [...] [T]here are a few managerial jobs. Would these jobs be for Arizonans or Canadians? (Resp. 0243).

Thus, while metropolitan proponents for the RCP argue for its benefits in terms of local jobs and job security in challenging economic times, being posed by many opponents residing in closer proximity to the mine site are questions of how such benefits are quantified and distributed. In other words, they contend the basis and meaning of numbers cited in terms of balancing arguments for or against the project. They ask, *who* benefits? But perhaps most significantly, oppositional views in relation to the employment argument focus on the disbenefits to already existing economies and jobs.

#### 4.3.3. 'Boom-Bust' and the environmental-economic balance

Meanwhile, among opponents, a sense of injustice at the redistribution of resources and livelihoods is exacerbated further by a view of the mining operation diametrically opposed to those who extol the 'security' arising from its 20-year duration. For local opponents (zones 1-3) citing the economic disbenefits, this time period should not be placed under the heading of 'pros' for the project, because it does not compensate for the longer-term environmental 'cons'. This temporal perspective relates to another recurring theme in the comments of those opposed to the mine on socioeconomic grounds: that of the unstable nature of the global markets upon which the purported economic and social benefits of the RCP are ultimately predicated. For 5% of these respondents, most of whom live in the Cienega Valley, the 'boom-bust' nature of global copper markets means that pragmatic claims made by proponents from Tucson, that the potential socioeconomic benefits of the Rosemont proposal outweigh the environmental externalities, take too much for granted. Indeed, 15% of these opponents contend the opposite, that the long-term damage to water and the environment upon which local livelihoods depend is too great a sacrifice for short-lived economic gains.

Twenty years or so of employment is not worth the price we will all pay for irreversible damage to this environment (Resp. 0192).

Rosemont Copper and its supporters justification for the open pit mine in the Santa Ritas rests entirely on exaggerated claims of positive impact the jobs created by this project will have on the local economy. It is incumbent on the USFS to prove that Rosemont Copper's MPO is reasonable in light of the innumerable adverse impacts that overwhelmingly outweigh the miniscule economic value to the local community (Resp. 0274).

When the jobs are over, and the land used up in 20 years, around 4,500 acres of wildlife habitat would be destroyed with losses for all aquatic and riparian dependent species, including migratory birds. Aquatic and riverfront ecosystems in the Las Cienegas National Conservation Area will be at risk of collapse from groundwater depletion? in perpetuity [sic] [...] This is not a trade off that the local ranchers, wineries, small hotels, restaurants, hunting guides, and bird watchers will want (Resp. 0243).

In making these economic counter arguments, opponents also voice concerns for the impacts to the quality of life for local people and future generations; arguing the Forest Service's role as guardians of public land over which they feel a sense of ownership; contesting the objectivity of the socioeconomic models (as well as the hydrological and air quality models) upon which the Forest Service's analysis and proponents subsequent claims are based; and questioning the conduct of the mining company in its efforts to inform and mobilise support for their proposal. For these respondents, behind the scientific claims and socioeconomic arguments for the RCP is a bias toward the asymmetric distribution and accumulation of resources and profits towards corporate capital at wider scales and away from environmental and socioeconomic capital at the local level.

#### 4.3.4. Property

Meanwhile, 14% of respondents cited concerns for the potential negative implications for property values in the area around the mine site. This perceived threat comes from a number of sources, including: the aesthetic impact of a copper mine upon the environment; the implications of groundwater drawdown for private wells and water access; the potential for that water to be polluted; and potential subsidence. These concerns were voiced overwhelmingly by residents of the Cienega Watershed, representing 46% of those citing this issue. Indeed, two out of five participants residing at this most local scale cited concerns for the personal economic implications in this sense.

As one of the many 'Snowbirds' who purchased a home, spent months and money remodeling, landscaping and furnishing the dwelling, I cannot move or sell the property at today's market value at age 83 and find another location to live out the rest of my existence. It may happen, although, because of the environmental effects of the proposed mine. (Resp. 0279)

I live here BECAUSE of the peace and quiet. If I didn't mind noise we could live downtown or next to the rail yard. Instead, we paid a steep price to insure our tranquillity. How does Augusta plan to reimburse us for that permanent loss? Or, for the loss we would suffer in property value? (Resp. 0324)

Myself and all regional [residents] depend on their well for water supply. [The] shift/drop in groundwater supply will [cause] irreparable [sic] damage [to] our properties and quality of life. (Resp. 0352)

A significant proportion of residents of the Upper Santa Cruz Valley (Zone 2) were also concerned (22%), but beyond this geographic scale there were few comments relating to property values.

#### 4.3.5. Sovereignty

On the opposite side of the argument on sovereignty, opponents to the mine from Tucson, the Upper Santa Cruz and Cienega Creek valleys refer to the 'foreign' nature of the mining company and its joint venture partners – being Canada and Korea-based respectively. For these respondents, the distribution of the financial benefits of the project will overwhelmingly be in favour of the executives and shareholders of these corporations, excluding local people and leaving them exposed to disproportionate levels of environmental and socioeconomic risk. Again, they cite issues around the nature of the jobs that will be provided, claiming that the majority will not be for local people. Furthermore, they argue, the copper ore itself will not be utilised to the benefit of the United States, but will be exported to other countries. Upending the claims of proponents relating to the economic dominance of China, this defensiveness is reframed in terms of that nation as the recipient of the copper and the adverse local impacts it embodies. These opponents contend, moreover, that the legacy of mining in the state of Arizona has more recently been one of economic instability and environmental destruction. They point to the transition away from the old economies and towards the tourist, recreation, science and technology industries that have developed in their wake.

The proposed plan to use some 6 or 7 K acre feet of potable water (possibly more) taken from our aquifer here in the Sahuarita-Green Valley area, & pumping it over the SR mountain range, to wash ore rocks, that are going to be shipped to the orient for smelting, the copper sold to other countries and the profits going to a foreign development company- is ludicrous! (Resp. 0272).

All rumors are --- is it true? ---the ore will be shipped to China, or possibly Japan. So those in favor of the mine saying the USA needs the copper have a little mistaken idea of how it will benefit the USA. Sounds like we will have to buy it back, at a higher price of course (Resp. 0335).

Profits will immediately be shifted to foreign lands and Arizona will be left with dirt piles, environmental messes and water depletion, allergies, and lung disease. It is all a bum rap!! (Resp. 0171).

One day, in the not too distant future, copper prices will fall again as the economy improves, the mine will be abandoned as no longer worth the effort, and we will be left with a hideous scar on once-spectacular land formerly enjoyed by all, a diminished treasure of wildlife and cultural history, the destruction of a rural, scenic highway (at taxpayer's expense) and a human population rendered less healthy - all to satisfy the reckless greed of a few Canadians (Resp. 0290).

#### 4.4. Socioecological impacts: water and nature

More than half of public respondents cited concerns for impacts of the mine upon water resources. These assertions related to fundamental threats to two aspects the integrity of water supply posed by the RCP: quality and quantity, or, put another way, pollution and availability. Thus, on one hand, potential emissions of chemicals and sediment produced during mining operations into surface water and groundwater flows are viewed as a threat to water quality and public health in the Cienega Creek watershed and the Tucson Basin. On the other hand, meanwhile, the abstraction of valued groundwater resources for copper production from the Upper Santa Cruz Aquifer and the hydrological impacts down-stream of the mine itself site are viewed as quantitative threats. Of respondents citing such concerns, just over one-third were residents of Tucson (Zone 3). Around one quarter, meanwhile, stated an address in the Cienega Watershed (Zone 1), the most proximate group to the proposed mine. Upper Santa Cruz Valley (Zone 2) residents were similarly well represented on this issue, constituting 17% of those highlighting water-resource concerns. Proportionally, however, this issue was most significant for residents of Zone 1, with more 84% of all respondents at the most 'local' geographic scale citing concerns for water resources, in comparison to 40% of Zone 3 residents.

The quantitative impact upon water resources was the most prominent concern, with almost half of respondents citing concerns relating to issues of availability of water for various uses. Meanwhile, just over one third of these respondents referred to threats to the 'quality' of potable water supply in their comments. Concerns for the Upper Santa Cruz aquifer related primarily to the effects of groundwater depletion arising from the abstraction of water on the west side of the Santa Rita Mountains to be used in the mining process.<sup>84</sup> Meanwhile, on the east side the range, where the

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<sup>84</sup> References to impacts to water at the proposed point of abstraction for the mine production also relate to concerns for the quality of the Colorado River water which would be used to recharge the Upper Santa Cruz Aquifer, via an extension to the Central Arizona Project canal. The argument is that the water in this aquifer, which is utilised for domestic and agricultural use in the area, would be compromised by the inferior quality of CAP water. Such concerns resonate with historic experience, to a controversy over the chemical make-up of the CAP water which led to sedimentation in the mains water system and the suspension of the project.

proposed mine is sited, comments highlight issues relating to both the hydrological impacts and the potential for pollution of groundwater flows<sup>85</sup> in the Cienega Creek watershed. In both respects the primary quantitative issue is the same: the stranding of domestic and municipal water supply wells. Groundwater drawdown due to abstraction could necessitate works to deepen existing wells, or strand them beyond use<sup>86</sup>. Meanwhile, this perceived threat is seen to exacerbate – and be exacerbated by – concerns over the ongoing drought in the Colorado River Basin, and the potential for shortages of Central Arizona Project water, which is used to recharge to Upper Santa Cruz Aquifer.

400+ residential wells on the west side and 500+ wells on the east side would be impacted. Please explain how Rosemont can ensure the viability of these wells, when the aquifer would be depleted and ongoing CAP water availability very uncertain. (Respondent 0255)

Recharging the aquifer with Colorado River water is not a solution. CAP water is of poor quality and unreliable. (Respondent 0212)

Rosemont's proposed recharge locations are too far downstream of where it would pump groundwater to offset the aquifer drawdown due to water usage at the mine. (Respondent 0301)

Qualitative concerns for water are not unrelated to the impact to hydrologic flows, as it is the latter which dictates the distribution of potential contaminants. The potential for toxic elements to leach from the mine site into the aquifer underlying the Cienega Creek watershed is thus a significant issue for many respondents. Such an eventuality, it is claimed, threatens the health of a significant number of private wells owners in the area. Moreover, this catchment is in the headwaters of the Santa Cruz River, with its waters flowing into the Tucson Basin and the aquifer from which the city abstracts its potable water supply.

Available groundwater resources may be degraded in quality and quantity by the activities of the proposed mine, including potential discharges of contaminated water to the underlying aquifer. This is a critical issue for the growing desert communities of southern Arizona, particularly for those homes reliant on water from privately owned wells (Respondent 0305).

[T]here are facilities, which will involve leaching procedures, which will result in the lowering of pH levels. In turn, this will mean the accumulation and concentration of dissolved minerals, heavy metals, and other toxins. In an attempt to dispose of the waste material, the risk of contaminating the aquifer

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<sup>85</sup> Surface waters were not a prevalent concern in respect human resources, however they are significant in the later discussion around ecological resources.

<sup>86</sup> It should be noted that there is also a strong economic element in these comments, in that the remedial works would be expensive and that there could be an impact upon property values.



is very high. Since the water table has been lowered, because of ground water pumping, the leaching and seepage of those minerals, heavy metals, and toxins will exacerbate the contamination. This is of immense concern to me!

The value of ecological landscape to the people who live in and visit the Santa Rita Mountains, the Cienega Creek watershed, the Coronado National Forest, and other areas potentially impacted by the mine strongly is evident in the comments submitted by the public. Indeed, adverse impacts to 'socioecological' aspects were cited by 43% of respondents whose comment submissions were analysed for this research. Of this group, 22% resided in the immediate locality of the proposed mine, in the Cienega Creek watershed (Zone 1). A total of 16%, meanwhile, were residents of Zone 2, beneath which lies the Upper Santa Cruz Aquifer from which water would be drawn for mining operations. Residents of the city of Tucson (Zone 3), meanwhile, constituted 69 of the 171 respondents citing socioecological concerns, with the remainder from further afield. As a proportion of those resident at each geographic scale, however, the prevalence of references under this theme was in line their proximity to the proposed mine site. A third of respondents from Zone 3 cited ecological issues, compared to 48% of those from Zone 2, and over half of commenters from Zone 1. References to riparian and aquatic ecosystems are prominent in the comments on the Draft EIS, with more than one third of those respondents who cited impacts to ecological resources specifically referring to riparian or aquatic habitats. For the respondents, threats to these habitats are inextricably linked to water courses and are again both quantitative and qualitative in nature. In this case, however, the likelihood of groundwater drawdown as a result of the pit excavation, the subsequent effects on surface water flows, and the consequences for riparian habitats in Davidson Canyon and Cienega Creek are the main emphasis of the concerns. Uncertainty in the Draft EIS over the extent of the hydrological impacts to these ecological resources mirror concerns related to domestic water supply. A major issue among respondents related to the hydro-geologic model used to predict the impacts to groundwater and surface water in the Cienega Watershed. With the geology being assumed as a medium of uniform porosity, the contention is that the resolution of the models is set too low. Thus, it is argued, the EIS is unable to predict the effects on water tables and water quality and secondary impacts such as to domestic water supply from wells, businesses, or biological resources which may or may not be located in protected areas. As one respondent argues:

A further issue with the flow modeling [sic] is the fact that it was done assuming homogeneous porosity/permeability (porous media assumption). No models were run in which the presence of high permeability hydrologic paths were included (Respondent 0369).

Meanwhile, plants and animals face the 'toxic' threat of water contamination by chemicals and heavy metals, and increased sediment loads threaten to disturb the hydro-geomorphological substrate upon which delicate riparian ecosystems have developed. Often referring to extracts from the Draft EIS document, respondents contended that the scientific analyses conducted, and the mitigation measures proposed are inadequate, and that the risks posed by the construction of the mine are unacceptable.

The mine would negatively impact [...] the streams and riparian areas of Davidson Canyon, Las Ciengas, and surrounding areas, which in turn will have a harmful impact on plants, wildlife and people that inhabit that area and those around it. (Respondent 202)

The mine would also affect 1,363 acres of increasingly endangered riparian habitat [...] Again, the DEIS does not offer any mitigation of these extremely adverse effects. (Respondent 360).

The Rosemont Valley forms the headwaters of Davidson Canyon, formally designated an Outstanding Water of Arizona due to its superior riparian qualities. Groundwater drawdown and potential surface water contamination by toxic runoff from the mine site threaten to severely degrade or destroy this precious resource. These are far reaching consequences that will involve the Cienega Creek and Davidson Canyon areas, not to mention local water wells necessary for local subsistence and the tourist industry. (Respondent 309)

One of most prevalent issues mentioned in the public comments relates to the function of these riparian habitats as 'wildlife corridors'. Respondents point to the importance of Cienega Creek and other watercourses for animal migration, genetic diversity, and thus their ecological significance beyond the Santa Rita Mountains and the Cienega Watershed. Indeed, this landscape-ecological perspective links with a much-valued feature of this part of the Sonoran Desert. The 'basin and range' geography in this region gives rise to what are colloquially known as 'sky islands', where the arid lowland deserts give way to alpine-forested mountain-tops, with various gradations of habitat in between. These isolated islands of habitat, and the numerous migratory, endemic and 'refugee' species which are found upon them, are a prominent concern in the public submissions, and relate to values for the particular species themselves which are discussed in the following section.

According to the "Water Quality Studies within the Cienega Creek Natural Preserve" done by the Regional Flood control District April 10, 2009, "These two streams are significant sources for Hydro- and Meso-riparian ecosystems and serve as excellent wildlife migration corridors between the Whetstone, Empire and Santa Rita Mountains to the south and the Rincon Mountains to the north." ...Cienega Creek and the tributary Davidson Canyon Wash are perennial streams rarely found at this low elevation. According to the Center for Biological Diversity, "Massive land disturbance and groundwater pumping

would bury miles of streams and dry up dozens of nearby seeps and springs, further degrading the habitat for all species in the area.” (Respondent 174)

The mine will be in the heart of a major wildlife corridor, which the Arizona Fish and Game calls the “anchor for three major wildlife corridors” so the mine’s effect would be on the entire Sky Island region. The mine’s water use would dry up nearly 100 seeps and springs, which are essential to many plant and animal species. Those seeps and springs that they don’t dry up, they would pollute, causing an irreversible negative impact to plants and animals throughout the region. The DEIS does not include specific replacement strategies for any seasonal or perennial springs that dry up as a result of the mine’s groundwater pumping or dewatering of the aquifer to create its open pit. As recommended by the Sky Island Alliance, the DEIS must provide more analysis on the mine’s water-use impacts on seeps, springs and riverfront plants. (Respondent 396)

While WUS have the capacity to carry or reduce pollutants and nutrients, their loss indirectly affecting surface water quality, they also support riparian habitats across the watershed. The regulation of these waters is therefore central to concerns over impacts to species of flora and fauna which inhabit the riparian zone. References to adverse impacts to such species were significant in the public comments, found in more than one quarter of respondents analysed in the thematic analysis conducted here. The fact that impacts to types of vegetation is the lesser-cited of the two perhaps reflects the framing of this thematic analysis, in that the riparian habitats which were the focus of the previous section are more commonly associated with species of plant. Thus, impacts to species of flora are more often directly associated (in comparison to species of fauna) with impacts to hydrology and water quality in the Cienega Creek watershed. While vegetation impacts are implicit in the respect they constitute the habitat (riparian or otherwise) for species of fauna, mentions of the various species of plant relatively infrequent. However, there are repeated references to threats to trees in riparian corridors and their rarity in the region; and to the Colemans coralroot, a rare species of orchid endemic to a small area of southern Arizona.

The proposal calls for the direct habitat loss of many thousands of mature trees, including oak and juniper. Tree-lined riparian areas, now a rarity in Arizona, are essential as roosting and breeding areas for birds and a host of other animals, many of which undertake regional migrations through the 'sky islands' of Southern Arizona [...] The area is startlingly beautiful, particularly because of the mature trees lining the canyons. (Respondent 305)

Another very important natural resource is trees. They, trees, have an immeasurable aesthetic [sic] value as well as the prevention of soil erosion. Finally, it would be at least sixty years before much of this area had substantial tree growth. (Respondent 194)

The draft environmental impact statement admits that the mine would likely drive the coralroot and chinchweed down the path toward extinction.  
(Respondent 246)

The prevalence of references to fauna over flora reflects the fact that there are eleven ESA-listed species of the former, compared to just two of the latter within the affected area. Respondents are more specific in their comments relating to the impacts to animals, with concern for birds and mammals particularly prominent. The migratory nature of many of these animals is a key feature, and links concerns for water resources and riparian habitats directly to their function as refuges and corridors, particularly for birds and species of big cat. References to the southwestern willow flycatcher, the Mexican spotted owl, and the western yellow-billed cuckoo, as federally listed species, are made by a significant proportion of respondents citing ecological resources. Meanwhile, even more comments cite concerns for the ocelot and the jaguar, both of which are listed as endangered under the Endangered Species Act.

Why are endangered and protected species, devastation to wildlife corridors, migrating birds and habitats not more important to the Forest Service than fear over an antiquated law that needs reform? (Respondent 330)

Other animals that have potential habitat in this area like ocelots, Chircahua [sic] leopard frogs, lesser long-nosed bats, Sonoran desert tortoises and yellow-billed cuckoo are also threatened greatly by the proposed Rosemont Mine.  
(Respondent 282)

The environmental impact is of great concern as this corridor is near some of the most biodiverse land left in the world [...] The thought of wilfully [sic] forever eliminating migration corridors for animals such as the Jaguar is unconscionable. (Respondent 198)

The jaguar, in particular, receives a great deal of attention from respondents, with many pointing to recent sightings in the region which had been widely reported by a conservation organisation. They emphasise the rarity of the jaguar's presence in the region, often pointing to the sightings as an indication of its recovery, return or 'rediscovery', and highlighting the aims of the ESA to maintain endangered populations by reducing threats to their survival.

#### 4.5. Conclusion

From the Thematic-Spatial Analysis, three primary domains emerged within which a number of related themes and sub-themes could be situated, two of which, the 'socioeconomic' and the 'socioecological' domains, formed the basis for the discussion in Sections 4.2 to 4.4. Themes relating to the third domain of 'water', it is argued here, cannot be understood in abstraction outside of their

interaction with socioeconomic and socioecological phenomena. Thus, in many ways qualities and flows of bodies of water link to and connect the potential socioecological and socioeconomic impacts of the proposed Rosemont Copper project and contestation over how those impacts are assessed.

The thematic domain of socioeconomic benefits was prevalent among the comments submitted by urban proponents for the proposed Rosemont Copper Project. Support for the project on this basis was minimal by comparison at either more local or more remote geographic scales in relation to the mine site. However, many respondents' claims for the benefits of the mine were articulated in relation to particular, yet abstract geographic scales beyond that of their city of residence. References to the 'local', 'the area', 'the region' and the state of Arizona are found in phrases such as 'Arizona needs the jobs', 'jobs for local people', 'jobs for the Tucson area', 'we need job opportunities here in Arizona'. Moreover, while arguments for the material benefits of increased revenues and the economic stimulus that the mine may generate are significant for this group, these arguments are frequently related to and justified by social and cultural arguments. Thus as well as the obvious perceived benefits of increased employment opportunities, arguments in support of socioeconomic benefits included those which view Arizona as a region in which mining is a cultural good and copper as a resource which should benefit its inhabitants.

By contrast, more sceptical respondents citing the risk of negative socioeconomic impacts are characterised by their closer residential proximity to the proposed mine site. The themes that comprise this domain are directly juxtaposed against those arguments for the socioeconomic benefits, albeit with a slightly different emphasis. Thus, in contrast to proponent's arguments for the generation of 'new' revenues and jobs in the 'local area', perceived risks of opponents relate to the potential implications for existing tourism and service economies in the immediate locality, adjacent to the mine site. Support for the preservation of a historical regional economic identity and a regained national economic sovereignty, meanwhile, are replaced by concerns for the *loss* local sovereignty over resources and livelihoods, including the potential financial implications for property values and water availability. For opponents, the economic crisis is not an argument for this type of activity. Conversely, their pervasiveness is asserted in terms of the boom-bust nature of the mining industry. Thus, for these respondents, the balance of uncertain, short-term economic benefits and guaranteed long-term environmental disbenefits implied by the proposed mine falls firmly into the latter bracket.

Meanwhile, the potential 'socioecological' impacts of mining arise due to the hydrological effects of the extractive process and the release of contaminants. Water – its material presence or abundance,

absence or scarcity, its flow and 'purity' – is, therefore, a central element through which competing arguments have been put to work in the case of the Rosemont Copper Project. Section 4.4 thus focussed on these contingent domains of the hydrological ('water') and the socioecological, analysing the thematic-spatial prevalence and content of the public comments in this respect. The prevalence of specific public concerns pertaining to the impacts upon the availability and quality of water as a domestic resource were highlighted. The significance of the relationship between water and socioecological values of a less instrumental, more extrinsic nature – for habitats and non-human entities of the human environment – were examined. Here, much emphasis is placed by respondents upon the function of habitats as 'refugia' for threatened or endangered species. The interrelationships between the two sub-themes of spatially defined riparian habitats (legally and socially constructed designations) and the often temporally transient species which inhabit them are frequently referred to by respondents, and become the object of considerable scientific and political contestation.

To properly contextualise the analysis discussed in this chapter, it is necessary consider the representativeness of the sample of public comments. Significantly, the extent to which the data analysed was representative of the entire database in terms of the thematic content of the public submissions was delimited by the sometimes arbitrary and ambiguous nature of the Forest Service's Public Concern Statements as the means of categorising the comments. For example, a single PCS could cover multiple themes or no substantive content at all. By contrast, the approach taken here applied an independent analysis that breaks down a sample of public comments from 397 respondents from a database of more than 21,000 into coherent themes which correspond to the aims and objectives set out in Chapter 1. Thus, it must be acknowledged that within the scope of this research it is not possible to achieve perfect representativeness in terms of matters of public concern. As the Forest Service did not analyse the comments in terms of respondents' residential location, the geographical representativeness of the present analysis is also restricted by the number of submissions in which residential locations could be identified within the available timeframe. However, the stratification of the sample for this analysis towards a level of proportionality in respect to expressed positions on the mine allowed the identification of the key issues and their geographic nature. These points of contestation were verified and triangulated through other means of investigation which form the basis for the continued analysis in the subsequent chapters of this thesis.

# **5. Agency in public engagement**

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Chapter 4 highlighted the highly contested nature of the Rosemont Copper Project proposal. It characterised the thematic and geographic nature of the issues, emphasising the predominance of socioeconomic arguments among urban advocates and the socioeconomic and socioecological contentions of opponents whose geographic distribution also encompassed the local, rural scale. Water and the implications of changes to flows and water quality for ecological, cultural and economic values were central to many of these arguments. The aim of this chapter is to consider the response of the NEPA EIS process, as implemented by the Forest Service, to these different concerns. More specifically, in response to RQ2, it offers an interpretation of what the institutional response to public input to the NEPA EIS process suggests about the substantive role of the public in the process? In other words, what is the agency of different groups and the arguments they make in the analysis of impacts of the proposed mine? To do so, this analysis firstly draws upon the Public Concern Statements (PCS), which were issued in response to the public comments alongside the publication of the Final EIS. These statements included summary responses to all of the valid comments (what the CEQ regulations term 'substantive' comments) addressing specific discrete issues identified by a process of 'content analysis' by the Forest Service.

The PCS responses were analysed according to their correspondence to the thematic domains identified in Chapter 4. From the 316 PCS response statements, the content of 110 responses corresponded to the thematic domains and themes identified by the thematic analysis in Chapter 4. This analysis identified 47 response statements that addressed issues of a 'socioecological' nature; 27 that pertained specifically to 'water' and water resources, which cut across the cultural and ecological themes of the socioecological domain; and 28 that related to concerns for the negative socioeconomic impacts of the proposed mine, many of which are contingent upon impacts to water and the environment. Meanwhile, the agency issued eight responses which addressed issues relating to the socioeconomic benefits of the mine, a relatively low number that can be explained by the advocative nature of the comments. The latter responses are excluded from the following discussion as they do not constitute substantive responses, being rather acknowledgements.

In respect to these thematic domains, the PCS responses were then themselves thematically categorised according to the nature of the inferences within their textual content. Four different types of response were identified according their prevalence. First, 'legal disavowal' entailed the rejection of respective arguments on the basis of legal regulations which determine institutional mandates and the range of possible actions or non-actions. This type of assertion was present in 19% of the total responses, half of which related to the socioecological impacts of the proposed mine. Second, 'scientific disavowal' entailed the discursive reinforcement of the scientific rationales



that were employed in the Draft EIS, thus denying the validity of alternative rationales. This type of response was the most prevalent, appearing in 57% of all those published following the public commenting process. Scientific disavowal was most often used in response to concerns of a socioecological nature and in respect to water issues. Third, ‘updated analysis’ entailed the conduct of additional scientific investigations or analyses conducted subsequent to the Draft EIS and/or in response to public comments, which typically supported the existing conclusions and were thus another form of scientific disavowal or legitimation. The latter type of response corresponded to just over half of the total issued, and while it also predominantly addressed socioecological and water-related concerns it was also significant in relation to negative socioeconomic arguments. The fourth type of response was ‘additional mitigation’, which refers to the incorporation of additional operational or technological measures to reduce or eliminate the risk of adverse impacts arising from the Rosemont mine. This was the least common form of response, constituting just 11% of the total and addressing concerns both of a socioecological and socioeconomic nature (see Table 5.1).

**Table 5.1 – Prevalence of types of response issued by the Forest Service to public comments on Draft EIS in respect to thematic domains.**

<b>Thematic Domain</b>	<b>Legal Disavowal</b>	<b>Scientific Disavowal</b>	<b>Updated Analysis</b>	<b>Additional Mitigation</b>	<b>Total Responses</b>	<b>% Total Responses</b>
Socioeconomic Positives	3	3	3	0	9	8%
Socioeconomic Negatives	9	11	16	4	40	36%
Socioecological	15	22	26	5	68	62%
Water	3	21	11	3	38	35%
<b>Total Responses</b>	<b>30</b>	<b>57</b>	<b>56</b>	<b>12</b>		
<b>% Total Responses</b>	<b>27%</b>	<b>57%</b>	<b>51%</b>	<b>11%</b>		

In sections 5.1 and 5.2 examples of the types of response outlined above and changes to the Final EIS document are respectively discussed in relation to the two thematic domains identified in Chapter 4. However, they specifically focus on the intersection of these responses with concerns of (a) a socioeconomic and (b) socioecological nature in respect to the Rosemont mine, both of which incorporate the cross-cutting domain of water at various intersections. An argument is constructed in Section 5.3 that the prevalence of types of disavowal and legitimation in the Forest Service’s responses to public comments is rooted in historical institutional norms, discourses, rules and laws. The chapter concludes by arguing that these institutional responses – in which public expressions of opposition are foreclosed upon – are an expression of entrenched political-economic imperatives supported by an instrumentalised scientific rationalism. I contend that NEPA as a space of

engagement is thus discursively depoliticised, restricting the agency of non-certified experts and alternative rationales for the assessment of socioecological and socioeconomic impact.

#### 5.1. Responses to the socioeconomic argument

In relation to the negative socioeconomic impacts of the proposed project, the Forest Service's content analysis identified 2,756 discrete comments from the public submissions, one-fifth of the total corresponding to the thematic domains identified by this research. Out of 28 responses issued by the agency pertaining to concerns for negative socioeconomic impacts, 24 were forms of disavowal. Disavowal on scientific grounds, which was found in 11 of the 28 responses to this area of concern (in response to 1,551 individual comments), was characterised by a number of different assertions. In some instances, issues were disavowed without justification, with many responses simply directing respondents to a certain part of the Final EIS in which, they state, the socioeconomic impacts in question are addressed. The most prevalent response to such concerns was, however, to highlight updated and/or expanded analyses that were presented in the Final EIS. While a number of these responses addressed public claims of the nature that the Draft EIS is analytically deficient, very similar wording was used in response to other assertions that the impacts in question are reason for the proposed mine to be rejected. In some instances, the agency highlighted independent studies that it had commissioned. Indeed, in introducing the changes made in Final EIS itself, and acknowledging the comments received, the Forest Service stated that a review of the original socioeconomic analysis by an economic research and consulting firm was commissioned. In addition, an internal review of the economic models used was conducted, with the 50-mile radius of economic impacts for the analysis was extended to incorporate the entire area of Pima, Cochise, and Santa Cruz Counties.

The "more complete picture" referred to in the responses on this issue is manifest in the greater detail in the Final EIS in relation to the impacts to jobs in particular sectors, and a significant increase in the amount of text relating to the negative impacts to employment following the public comments. Perhaps most notable, however, were amendments to the agency's 'Summary of Effects' relating to socioeconomics and environmental justice between the Draft EIS and Final EIS documents. As the extracts from both documents in Table 5.2 show, the shift in emphasis from a 'qualitative' to a 'quantitative' assessment of the change in tourism revenue was accompanied by the substitution of the previously purported 'negligible' impact with the actual quantification of the direct and indirect economic impacts on both the tourism and recreation industries. Meanwhile, a separate issue statement on impacts to the astronomy industry was included in the Final EIS, suggesting decreased revenues from the related activities.

For these areas of public concern, however, despite the substantive changes made to the Final EIS following the public comments in relation to tourism and recreation, the Forest Service's response to the implicit and explicit opposition from many of these respondents was to disavow ultimate legal responsibility for the final decision beyond the assessment of its impacts. This 'legal disavowal' was present in nine of the 28 responses to concerns for negative socioeconomic impacts. In so doing they specifically invoked the mining laws and, by implication, the General Mining Act of 1872. Here, the agency repeatedly cites the legal limitations upon any 'discretion' if may be able to exercise. While acknowledging that the project would have some inescapable negative impacts to local communities, therefore, one of the Forest Service's main points of argument was to highlight the legal "sideboards", in the shape of federal mining laws, which constrain the range of possible decisions which can be arrived at:

It is important to understand the Forest Service role in terms of decision space and legal sideboards regarding the Rosemont Copper Project. The Forest Service legal authority regarding mining proposals is limited. As stated in the DEIS and FEIS, although the Forest Service may reasonably regulate mining activities to protect surface resources, there are statutory and constitutional limits to its discretion. The Forest Service may reject an unreasonable Mine Plan of Operation but cannot categorically prohibit mining or deny reasonable and legal mineral operations under the mining laws. The Forest Service is required to assess and disclose potential social and environmental impacts in an EIS and can require reasonable modifications to mine plans of operation and mitigation measures. The Socioeconomic impact analysis has been updated since release of the DEIS. It acknowledges that all action alternatives would impact the quality of life or local residents and communities, and could result in loss of jobs in some aspects of the economy, such as tourism. A number of other analyses were also updated, and additional mitigation and monitoring measures identified. The Forest is required to disclose environmental impacts and benefits in the NEPA document and consider those in the final decision. Impacts and benefits of the proposed project have been analyzed using the best information available, and the results disclosed in the FEIS.

In addition to the legal disavowal in which the Forest Service appeals to the public in terms of the legal limitations upon any discretion it might have as an agency whose perceived role is often for environmental protection, the response thus seeks to highlight its objective role as arbiter of the 'best available' scientific information.

Meanwhile, very few responses were issued by the Forest Service that related to comments on the socioeconomic benefits of the Rosemont mine. This is perhaps striking, considering the volume of 'discrete comments' of this nature identified by their own content analysis process and the

**Table 5.2 - Amendments to Final EIS ‘Summary of Effects’ relating to socioeconomics and environmental justice between the Draft EIS and Final EIS**

Draft EIS		Final EIS	
Issue	Effects	Issue	Effects
11A: Qualitative assessment in change of tourism revenue over time	Negligible changes in regional tourist spending. Adverse impacts on dark skies could result in an impairment of observatories near the project area, which could result in a decrease in State revenues generated from astronomy, space, and planetary research and tourism.	11A.6: Quantitative assessment of change in tourism and recreation revenue over time	Direct effects: \$1.4 to \$4.7 million reduction in visitor spending per year. Indirect effects: \$621,900 to \$2.1 million reduction in output per year. 15 to 50% decrease in nature-based tourism from 0 to 10 miles from proposed mine per year.
Astronomy industry not directly addressed in Draft EIS		Issue 11A.7: Qualitative assessment of economic effect on the astronomy industry	Increased night sky brightness could result in an impairment of observatories near the project area, which could result in a decrease in State revenues generated from astronomy, space, and planetary research and tourism. The negative public perception of having a copper mine next to an observatory may impact observatory revenues.

proportion of respondents found by this thematic analysis to have made such comments. Thus, while the negative socioeconomic arguments are disavowed, the positive economic arguments are largely taken at face value, assumed as valid and left unchallenged. Other than adopting a position of neutral objectivity, stating that such benefits may or may not arise, there is no questioning of assertions of the economic benefits of the project.

## 5.2. Responses to the socioecological argument

In relation to concerns of a socioecological nature, meanwhile, the Forest Service identified 2,884 discrete comments from the public submissions, 21% of the total corresponding to this thematic domain. The agency’s responses were both more numerous and more inclined toward scientific disavowal than was the case with the socioeconomic issues discussed above. Again, these responses often negated assertions of opposition to the project on such grounds, instead pointing to sections of the Final EIS in which impacts to socioecological aspects are scientifically analysed. Where substantive revisions to the Final EIS (updated analysis) were alluded to by the Forest Service (in the responses to 709 discrete comments identified in their content analysis), these were often in vague

terms of analyses of certain aspects being ‘revised’, ‘updated or ‘expanded’ for the document. In particular, the impacts specifically to riparian habitats were separated into a new section in Chapter 3 in the Final EIS, which specifically focuses on ‘Seeps, Springs and Riparian Areas’. The expanded analytic contained within this new section included:

- Incorporation of more expansive riparian mapping data from Pima County, paying particular attention to the function of riparian zones as ‘wildlife corridors’.
- Expanded scope of the impact analysis of riparian habitat (beyond acreage of riparian habitat that may be affected) to include “the expected impacts to the function of these springs, seeps, and riparian areas in terms of vegetation type and health.”
- Revised seeps and springs inventory following additional field investigations, reducing uncertainty associated with the analysis of expected impacts to seeps and springs.
- More complete impacts analysis of Outstanding Arizona Waters (OAWs) located in lower Davidson Canyon and along Cienega Creek, focusing on criteria specified by regulation and original nomination for those OAWs.<sup>87</sup>

Despite refinements made to the analysis following the Draft EIS, the Forest Service themselves acknowledged in the Final EIS that, “due to the limited accuracy of the groundwater models,” there remains “significant uncertainty” over the rate of change to the water table and the spatial extent of the impact of those changes.<sup>88</sup> Predictions encompassed a wide range of possibilities, from no impact at all, to extensive dewatering in parts of Cienega Creek, and over time scales ranging from decades to hundreds of years into the future. In order to negate some of the adverse effects, and in response to comments from the public and cooperating agencies, the Final EIS included additional mitigation and monitoring measures, beyond those originally included in the draft version. These measures were aimed at negating impacts to the quantity and quality of groundwater and surface water resources for human use and ecological flows. While the Draft EIS lists 20 mitigation and monitoring measures, the final documents include more than 90 measures and describes them in greater detail. Nevertheless, irrespective of these efforts, in relation to the quantitative impacts on both sides of the Santa Rita Mountains, the Final EIS acknowledges that loss of water from the aquifer in the Cienega Creek watershed will continue “in perpetuity” as a result of the mine pit excavation. Moreover, it adds that there would be permanent and irretrievable impacts to

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<sup>87</sup> See Appendix 6.3 – Final EIS, p. 485

<sup>88</sup> See Appendix 6.3 – Final EIS, p. 505

groundwater quality, surface water flows and quality and irreversible degradation of riparian habitat.<sup>89</sup>

However, in addition to conducting reviews which refuted many public assertions that the analyses were scientifically unsound or unreasonable, in this case the Forest Service was compelled by cooperating agencies to incorporate additional levels of scientific enquiry alongside further mitigation and monitoring measures into the Final EIS. Nevertheless, the increased level of analysis remained insufficient to ameliorate uncertainty and conflict – among both the public and cooperating agency employees - over the impacts of the proposed copper mine to water resources and riparian/aquatic habitats. This effectively renders the lead agency for the NEPA EIS process unable to unequivocally reject or accept concerns expressed by the public. Thus, in relation to the impact to riparian habitats, the Forest Service again disavow responsibility on the basis of jurisprudence, in this case citing the Clean Water Act of 1972 (CWA).

The CWA forms the major federal legislation governing water quality, and is of particular significance to the RCP. The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.”<sup>90</sup> Section 404 of the act establishes a permit program for the discharge of dredged or fill material into jurisdictional ‘Waters of the United States’ (WUS). WUS include all interstate and intrastate waters including rivers, streams (including intermittent streams), lakes, and wetlands. While the Final EIS analyses the direct and indirect impacts on potential WUS and the presence/absence of special aquatic sites for each alternative, administration of the CWA permit is delegated to the United States Army Core of Engineers (USACE) by EPA. As stated in the Final EIS, the Forest Service thus cedes ultimate responsibility for the impacts to WUS to the USACE.

The increased level of descriptive detail in the analysis of impacts to what the agency terms ‘biological resources’ is manifest in its 153 pages – compared to the 66 pages for this section in the Draft EIS – and is evident in a comparison of the two documents’ ‘summary of effects’ shown in Table 5.3. However, perhaps the most substantive change cited in the summary of ‘changes from the Draft EIS’ relates to the section on ‘special status species’, which include those federally protected by the ESA. Here, descriptions of species which are likely to be impacted were supplemented by a quantitative geographic information system (GIS) analysis of the area of possible habitat loss or alteration for each such species within the analysis area.<sup>91</sup> Notwithstanding this analysis however, the Forest Service emphasises in its responses to the public comments that the ESA requires

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<sup>89</sup> See Appendix 6.3 – FEIS p. 1131-1142

<sup>90</sup> 33 U.S.C. §1251

<sup>91</sup> See Appendix 6.3 – FEIS, p. 671

**Table 5.3 – Comparison of ‘Summary of Effects’ in relation to plant and animal species between the Draft and Final versions of the EIS.**

Issue	Draft EIS – Summary of Effects	Final EIS – Summary of Effects
Issue 5A.1: Acres of terrestrial vegetation permanently lost or altered, by vegetation type.	6,380 to 6,461 acres lost or converted.	5,612 acres permanently lost or altered; see table 122 for breakdown by vegetation type.
Issue 5C.1: Acres of disturbance that could create conditions conducive for invasive species.	6,380 to 6,461 acres disturbed.	5,612 acres disturbed in the project area; an additional 162 acres of xeroriparian habitat in Barrel Canyon, 502 acres of xeroriparian habitat in Davidson Canyon, and 407 acres of hydroriparian habitat in Empire Gulch could be indirectly impacted by reduced surface water flows and groundwater drawdown resulting conditions conducive to invasive species.
Issue 5D.1: Qualitative assessment of the change in movement corridors and connectivity between wildlife habitats.	Increased fragmentation and reduced connectivity.	Increase movement habitat fragmentation and disrupt dispersal and migration patterns of species using five animal movement corridors; restore small amount of three movement corridors due to decommissioning of roads.
Issue 5D.2: Qualitative assessment of mortality of various animal species resulting from increased volume of traffic related to mine operations.	Animal road kills on State Route 83 will approximately double by year 20 of mine operations.	Animal mortality would likely increase for some species types but could decrease for other species types (depending on local wildlife populations and natural histories of species encountering roads) during mine construction and active mine operations.
Issue 5E.1: Acres of habitat disturbed for each special status species, including impacts to designated and proposed critical habitat.	6,380 to 6,461 acres lost or converted.	5,612 acres lost or converted; refer to table 123 <sup>92</sup> for detailed information regarding these impacts; refer to species’ narratives in “Environmental Consequences” section for discussions of impacts to designated or proposed critical habitat.
Issue 5E.2: Potential to affect the population viability of any species of concern.	Could be reduced for at least 3 sensitive species.	Individuals may be impacted, but loss of population viability is not likely.
Issue 5F.1: Acres of habitat impacted from noise, vibration, and light.	Up to 145,190 acres impacted.	Up to 146,163 acres impacted.
Issue 5F.2: Qualitative assessment of effects on wildlife behavior from noise, vibration, and light.		Changes in habitat use, timing of activity patterns, inter- and intraspecific communication, foraging efficiency and success, reproductive success, and predator-prey relationships.

<sup>92</sup> See Appendix 6.3.5, pp.673

consultation with the federal United States Fish and Wildlife Service (USFWS) to ensure that actions do not jeopardize the continued existence of any listed species or modify designated critical habitat of such species. The agency cites the subsequent issuance of a 'Biological Opinion' by the USFWS to the effect that the proposed mine would not constitute a threat to any listed species in either of these regards.<sup>93</sup> Thus, legal disavowal was also a common response in relation to the socioecological impacts of the proposed mine, is typified by recourse to parallel federal laws, compliance with which effectively determines the NEPA decision-making process.

Concerns for impacts to water and water resources were identified in 2,466 discrete comments in the Forest Service's content analysis, almost 18% of the total relating to the thematic domains identified by this research. The agency categorised these comments into 27 more specific issues of public concern (PCS), which varied considerably in terms of their implied scope and emphasis. While most address concerns for groundwater and surface water resources simultaneously, some focus specifically on issues related either to impacts upon water quality and pollution, or water quantity and scarcity. Others, meanwhile, conflate qualitative and quantitative impacts into a more generalised concern statement for water resources. Some emphasise water as a utilised domestic resource, while others also implicate the impacts to socioecological aspects. Furthermore, many of these statements point to comments that assert more specific concerns, such as for private wells, the pit lake, riparian habitats, legal and planning issues, or scientific modelling. Within the PCS categorisations relating to water, the Forest Service variously emphasises claims made by respondents asserting that the proposed project should not proceed, and those which claim the matters at issue are insufficiently analysed in the Draft EIS.

Of the 27 response statements issued by the agency in response to water-related concerns, 24 corresponded to forms of legitimation or disavowal, characterised by refutation of arguments on scientific basis, the incorporation of additional analyses into the Final EIS, or both. Out of the 2,468 discrete comments identified by the agency on the issue of water, 699 were categorised into PCS 314, which specifically addresses a perceived tension between water scarcity in the region and the absence of any regulation on the amount of water which might be used by the project for mine processing needs:

PCS 314: The Coronado National Forest should not allow the Rosemont Copper Company project to move forward. Because of the high level and lack of limits of proposed water usage; the scarcity of water (both groundwater and Central Arizona Project water); and the impacts of water depletion on people as well as

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<sup>93</sup> See Appendix 6.12 - Responses



the natural environment (including impacts to water sources and wildlife, as well as subsidence resulting from the use of groundwater).<sup>94</sup>

The Forest Service's response to these comments highlights the various sections of the Final EIS which address the quantitative and qualitative impacts to water resources, the implicated human and non-human effects, and the measures which are proposed to mitigate for and minimise these impacts. The Final EIS document, however, describes the various changes and additional analyses conducted since the publication of the Draft EIS. Some of these changes were the result of ongoing analyses, while others were in direct response to the comments received from the public and various other cooperating agencies. Nevertheless, none of the changes or mitigation measures proposed address the fundamental arguments implicit in the comments: that water resources are increasingly scarce due to the effects of climate change and drought, and that water withdrawals for mining production are unlimited. The latter concern is, however, addressed in PCS 916, in which the Forest Service argues that the regulation of groundwater pumping in the Santa Cruz ultimately falls under the responsibility of the Arizona Department of Water Resources. However, they concede that "any substantial change in water use could trigger a review of the applicability of the current NEPA analysis by the Forest Service."<sup>95</sup>

Similarly, little change to the analysis of the quantitative and qualitative impacts to water on the east side of the Santa Rita Mountains arose out of the public commenting process. As highlighted earlier, a major issue among respondents related to the hydro-geologic model used to predict the impacts to groundwater and surface water in the Cienega Watershed. With the geology being assumed as a medium of uniform porosity, the contention is that the resolution of the models is set too low. Thus, it is argued, the EIS is unable to predict the effects on water tables and water quality and secondary impacts such as to domestic water supply from wells, businesses, or biological resources which may or may not be located in protected areas. As one respondent argues:

A further issue with the flow modeling [sic] is the fact that it was done assuming homogeneous porosity/permeability (porous media assumption). No models were run in which the presence of high permeability hydrologic paths were included (Respondent 0369).

In further response to these comments, the sections on 'Groundwater Quantity' and 'Surface Water Quantity' in the Final EIS describe a series of consultations undertaken with various cooperating agencies and specialists to review the scientific basis for the analysis. The description of this review,

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<sup>94</sup> See appendix 6.12, PCS Ref. 314

<sup>95</sup> See appendix 6.12, PCS Ref. 916

and others pertaining to the modelling protocols, constitutes most of text in the sub-sections entitled “Changes from the Draft Environmental Impact Statement” for the respective sections on ground and surface water quantity. However, in each case, the Forest Service concludes that the models used are valid for predicting impacts related to the project. Indeed, in its response to calls for a more thorough analysis of the hydrological impacts, the agency again points to its utilisation of ‘best available’ scientific methods - stating that it has:

reviewed all comments submitted regarding water resources and hydrologic investigations for applicability to analyzing [sic] impacts to water resources [and] believes that the methods utilized [sic] and portrayed in the FEIS are the best methods available, are scientifically sound, and are reasonable for predicting impacts to groundwater and surface water resources.<sup>96</sup>

In addition to PCS categories which suggest a focus exclusively on water quantity or water quality, others combine discrete comments which relate to both aspects. Nevertheless, irrespective of the nature of the PCS in this respect, or whether the statement characterises comments suggesting rejection of the mining proposal on these grounds, the Forest Service’s responses repeatedly cites independent reviews which reject any argument that the techniques and parameters used to determine the impacts are unreasonable or inadequate. The updated ‘Groundwater Quality’ and ‘Surface Water Quality’ sections of the Final EIS detail various reviews undertaken by the mining company, independent consultants (SRK Consulting), cooperating agencies, and the Forest Service. However, the agency also repeatedly qualifies this assertion by pointing to the inherent uncertainty of scientific modelling. In mitigation, therefore, they highlight the various post-construction monitoring provisions which are included in the Final EIS. As one response states:

Based on the reviews conducted, the Forest believes the analysis of predicted surface water and groundwater quality to be reasonable and acceptable [...] Recognizing that predictions do not mean that unexpected effects will not occur, monitoring plans are also included as an attachment to the FEIS.<sup>97</sup>

Despite these disavowals the sections on ‘Groundwater Quantity’ and ‘Surface Water Quantity’ in the Final EIS describe a series of consultations undertaken with various cooperating agencies and specialists to review the scientific basis for the analysis. The description of this review, and others pertaining to the modelling protocols, constitutes most of text in the sub-sections entitled “Changes from the Draft Environmental Impact Statement” for the respective sections on ground and surface water quantity. As discussed in Chapter 6, however, this response reflected considerable tensions

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<sup>96</sup> See Appendix 6.12, PCS Ref. 880

<sup>97</sup> See Appendix 6.12, PCS ref. 313 (See also PCS refs. 364, 366, 372, 876).

within the Federal Advisory Committee, rather than the weight of public concern. In any case, the Forest Service ultimately concluded that the models used are valid for predicting hydrological impacts related to the project.

### 5.3. Discursive framings: multiple use, purpose and need, best available science and the Law of 1872

Few of the Forest Service's responses to public comments analysed (8%) addressed socioeconomic positives of the proposed mine, whose authors were largely composed of the 41% of respondents in favour of the project. The vast majority of responses, therefore, addressed the concerns of those respondents citing the socioeconomic and socioecological contradictions of the project, of whom a significant proportion had stated their opposition to it. The repeated disavowals of these arguments highlighted by the analysis in this chapter can be traced back to historical imperatives given to mining by law, and reinforced by institutional rules and norms which remain influential today. As discussed below, most prominent and significant in discursive framings and justifications in response to public concerns on the Rosemont issue were conceptions of: 'action' as conceived as the 'purpose and need' of the project and the 'action alternatives' in the EIS process; 'multiple use' as a principle aim of the Forest Service; the mining laws; and 'best available science' as an aim and justification for the scientific methods and data upon which the EIS rests.

The identification of a 'purpose of and need for action' ('purpose and need') by the lead agency following receipt of a mine plan of operations (MPO) from a proponent is the first step in the NEPA process. This brief statement sets out the instrumental reasoning and objective for the proposed project that, once established and identified as having potentially significant environmental impacts, triggers the EIS process. The agency, in this case the Forest Service, is then responsible the identification and selection of 'reasonable alternatives' for the proposed development. These action alternatives are a range of possible plans of operations through which the 'purpose and need' would be achieved. Each of these alternatives must be assessed, from which the least damaging alternative must be selected. In addition, there must also be a 'no action alternative', which is a notional alternative in which the impacts (or non-impacts) of not proceeding are assessed. This acts as the baseline against which the 'action alternatives' are assessed. However, the fact that the 'reasonable alternatives' themselves are defined by reference to a project's objectives means that those which do not meet the 'purpose of and need for action' (purpose and need) are invalid and the no-action alternative is itself not a legally viable option.

In the specific case of the Forest Service, 'purpose and need' decisions are guided largely by the agency's constitutional requirement to manage National Forest System land for 'multiple uses', including hard rock mining. 'Multiple use' is defined by the 1960 *Multiple-Use Sustained-Yield Act* (MUSY) which requires that National Forest System (NFS) lands be administered in a manner that includes consideration of the relative values of various resources (beyond forestry) as part of management decisions – as the “management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people”<sup>98</sup> This is alluded to in a number of the responses to public comments on the perceived role of the agency as guardian of public lands and in rationales for rejecting oppositional comments.

However, it is notable that the concept of 'multiple use' was introduced to the Forest Service by its first chief, Gifford Pinchot. The term originated from Pinchot's definition of conservation and was part of his principle of 'wise use'. It was his view that public land should be used simultaneously for productive purposes such as timber and mining as well as for recreation and wildlife habitat that later became the essence of the MUSY. The multiple-use and wise use concepts advocated by Pinchot reflected the view that nature's resources should be scientifically managed so as to protect the basic productivity of the land and its ability to serve future generations. His principles were also later taken up by the 'wise use movement', which remains a loose-knit coalition of groups promoting the expansion of private property rights and deregulation of public lands, arguments which emerged repeatedly in public comments and wider discourse in support of the Rosemont Copper Project. This movement's activities include advocacy on behalf of commercial and public interests seeking increased access to public lands and opposition to environmental laws and the environmental movement.

The Forest Service's position can thus be related to its historical institutional development, from socialist experiment in public trust-building (from 1905); to professional scientific agro-forester bureaucracy from the 1950s to the 1970s, from when the agency had to renegotiate a conflicted identity as both an agent of economic resource development and steward of recreational, wildlife and landscape values which gained so much political traction with the environmental movements of the late 60s (Kennedy and Quigley 1998). Over the course of that 'middle' period, the Forest Service had nevertheless developed strong hierarchical organisational structures and processes (i.e. line-staff, generalist-specialists, or strict functionalism) to administer definite National Forest System

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<sup>98</sup> 16 U.S.C. § 528-531

‘units’ of production (ibid). Alongside compliance to federal laws enacted during the pre-Forest Service era of ‘frontier economics’ – which conferred rights upon entities to develop resources on public land – and the post-war environmental laws (including NEPA), the principled concepts of ‘multiple use’ and ‘best available science’ have become pervasive in agency policy and decision rationales.

Assertions of ‘best’ available methods and information commonly appearing in the responses to public comments and rationales in the EIS are related to the concept of ‘best available science’, which in fact originates from the *Endangered Species Act (ESA)*.<sup>99</sup> The ESA requires that “each agency shall use the best scientific and commercial data available” when evaluating a proposed action’s impact on an endangered species. In contrast, however, the NEPA regulations demand that information be of a ‘high quality’ and ‘professional integrity’<sup>100</sup>. Nevertheless, reference to the ‘best available science’ appears throughout the Forest Service’s documentation for the Rosemont project. It’s prevalence in the rationales for the EIS may be explained by the fact that the ‘best available science’ standard is also specified in the regulations implementing a central piece of legislation for the Forest Service, the *National Forest Management Act of 1976*<sup>101</sup>. However, as discussed Chapter 6, the innate ambiguity of this term and diverging opinion on its definition is a central factor in political tensions over the assessment of impacts of the mine.

Notwithstanding the above, the most prominent response to the public comments of the Draft EIS, particularly in relation to concerns for the negative socioeconomic impacts of the Rosemont project, was to cite the “statutory and constitutional” limits to the discretion of the agency in making decisions due to the mining laws, specifically the 1872 *General Mining Act* and the 1970 *Mining and Minerals Policy Act* and their subsequent amendments. These laws confer the right to free exploration and purchase of public lands for the purposes of mining, provided that a mine plan of operations is approved by the agency responsible for the NEPA EIS process. As the key informant for the Forest Service stated under interview, the 1872 mining law is a driving force in this case, creating a contradiction which is “hard for the public to understand” in that the Forest Service is typically thought of in terms of conservation and protection, “but the mine laws basically trump multiple use aspects of how the National Forest is managed.”<sup>102</sup> This apparently inexorable truth was apparent as early as the publication of the ‘notice of intent’ to conduct the NEPA EIS process, which announced

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<sup>99</sup> 16 U.S.C. 1536(a)(2)

<sup>100</sup> 40 CFR 1500.1, 1502.24

<sup>101</sup> 16 U.S.C. 1600 et seq.

<sup>102</sup> See interview notes: Appendix 18.11

that “[t]he purpose of the proposed Forest Service action is to *grant permission* to the Company to use NFS land for certain activities related to operation of the Rosemont Mine”, before adding that this need for action is “based on statutes and policy that govern mining on NFS land” (see Box 5.1).<sup>103</sup>

In the case of the Coronado National Forest, the well-established lines of managerial responsibility (Forest Supervisor-Regional Forester-Deputy Chief- Chief-USDA Under Secretary for Natural Resources and the Environment-USDA Deputy Secretary-USDA Secretary) have ensured the deployment of and adherence to a discursive framing which attempts to legitimise an abstract scientific rationale for the regulation of the contradictions of the proposed Rosemont Copper Project; and a legal disavowal in which responsibility is placed on the legislature, beyond immediate

**Box 5.1 – Extract from the Forest Service NOI for the proposed Rosemont Copper Project (Federal Register 2008).**

The purpose of the proposed Forest Service action is to grant permission to the Company to use NFS land for certain activities related to operation of the Rosemont Mine. The agency's need for action is based on statutes and policy that govern mining on NFS land.

Most NFS land is subject to the location of certain minerals under the Mining Law of 1872, as amended (30 U.S.C. § 21-54, et seq.), and the directives in Forest Service Manual 2800. Prospecting, locating, and developing the mineral resources on NFS land are also subject to other rules and regulations. These include, but are not limited to, the following:

1. The 1897 Organic Administration Act (30 Stat. 11, as amended; 16 U.S.C. § 473-475, 477-482, 551) grants the Secretary of Agriculture the authority to regulate the occupancy and use of NFS lands. It provides the public with the continuing right to conduct mining activities under general mining laws and in compliance with rules and regulations applicable to NFS lands. It also recognizes the rights of miners and prospectors to access NFS lands for prospecting, locating and developing mineral resources.
2. The 1960 Multiple-Use Sustained-Yield Act (74 Stat. 215; 16 U.S.C. § 528-531) requires that NFS lands be administered in a manner that includes consideration of the relative values of various resources as part of management decisions and specifically provides that nothing in the Act be construed to affect the use or administration of the mineral resources on NFS lands.
3. The 1970 Mining and Minerals Policy Act (84 Stat. 1876; 30 U.S.C. § 21a) established the Federal Government's policy for mineral development, “\* \* \* to foster and encourage private enterprise in the development of economically sound and stable industries and in the orderly development of domestic resources to help assure satisfaction of industrial, security, and environmental needs.”
4. Regulations at Title.36, Code of Federal Regulations, part 228A, set forth rules and procedures governing the use of NFS lands in conjunction with operations authorized by general mining laws. Part 228.3(a) specifically addresses the development of mineral resources.

<sup>103</sup> See Appendix 6.8 – p. 13528. Emphasis added.

contestation. Thus, even before the federal process commences, and before the public are invited to participate, the trajectory of the NEPA EIS process appears to be preordained subject to compliance with federal and state-level environmental legislation. For the Forest Service, “[t]he decision-making space is limited. Responsibility for protection of surface resources is superseded by the responsibility to meet federal laws. Reasonable access must be allowed to the mineral right.” The public, they claim, “has a hard time understanding this.”<sup>104</sup>

#### 5.4. Conclusion

By analysing the institutional response to the public comments, this chapter has introduced a perspective on the democratic capacity of the NEPA EIS process, in terms of agency lent by the commenting process to public participants. The mandatory written responses and the related changes (or non-changes) made to the Final EIS were characterised according to four categories, which – as they are not mutually exclusive – loosely correspond to increasing levels of agency. At the most fundamental level, ‘legal disavowal’ entailed the denial of responsibility for what constitutes a structural bias toward mining interests, placing outright opposition and the possibility for rejecting the mine proposal beyond efficacy. Secondly, ‘scientific disavowal’ entailed the deployment of institutionalised discursive framings, as well as unsubstantiated refutations, which sought to legitimise the methods and information upon which the impact assessment was based. Thus, claims that analyses were reflective of the ‘best available science’ served to disavow and exclude alternative knowledge claims. At the third level of influence, claims of inadequate scientific methods in the EIS often met with a response that ‘additional analys[es]’ had been conducted which addressed the issue in question. The latter assertion served to reinforce existing scientific rationales and assessments of risk posed by the action. Finally, at the highest level of influence, the response of ‘additional mitigation’ signified the incorporation of measures aimed at mitigating the extent of the impacts in question in the proposed plan of operations.

More than half of the responses to the public comments were found by the analysis described in this chapter as being ‘scientific disavowal’, most of which addressed socioecological impacts. A similarly high proportion of the responses were found to highlight ‘additional analysis’ that had been conducted. One quarter of response, meanwhile, entailed outright ‘legal disavowal’. While a significant minority of responses made concessions in terms of ‘additional mitigation’ measures. In a situation in which 48% of those submitting comments on the Rosemont Copper proposal explicitly stated opposition to the mine on the grounds of the arguments highlighted in Chapter 4, ‘additional

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<sup>104</sup> See interview notes: Appendix 18.11

mitigation' can in itself be seen as a form of disavowal and legitimation of techno-scientific solutions. In this example of the NEPA EIS process, while some of those who are fundamentally opposed to the mine are included, and by their participation it was possible to reduce the potential adverse impacts, the space for fundamental opposition to the mine is non-existent.

Finally, in Section 5.3, I situated these responses of disavowal and legitimation in relation to historical institutional discursive framings, norms, rules and legislation, which combine to constitute a situation in which the antagonistic and non-certified knowledge claims of the public are ignored. In particular, I highlighted four such framings as significant in this case. Firstly, the conceptualisation of 'action' in terms of 'the purpose and need for action', the 'reasonable [action] alternatives' the notional nature of the 'no action alternative' which create a situation in which the possibility of the decision being negative is precluded from the outset. Secondly, the prominence of the 'multiple use' imperative for the Forest Service creates a tension between the agency's legal mandated mission as developer of resources for the benefit of the American people – a position with links to the 'wise use' movement – and its simultaneous responsibility for conservation, which is given greater importance by the environmental movement. Third, the adoption of the phrase 'best available science' as the notional standard to for the Forest Service's assessment of the potential impacts of the proposal is effectively used to seal off the EIS process from alternative forms of knowledge and knowledge production, severely limiting the efficacy of the public commenting process. Fourth, and finally, recourse to the mining laws, quite correctly, places the ultimate responsibility for the fate of the mining project in the hands of legislators and their continued favouring of mining capital over meaningful democratic decision-making.

Chapter 7 discusses how this analysis builds on previous research and literature in the fields of Political Ecology, Science and Policy Studies, Science and Technology Studies (STS), and theories of democracy and post-politics, which point to the structural influences of power, discourse and hegemony. First, however, in the following chapter, insights from in-depth qualitative research are used to highlight how these discursive framings are contradicted and contested when the antagonistic political energies disavowed in the NEPA EIS process re-emerge in heterogeneous spaces of association and re-politicisation.



# 6.

## Spaces of re-politicisation: science, ethics and power

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Chapter 4 showed how competing arguments around socioecological and socioeconomic values were articulated across geographic scales of proximity to the proposed Rosemont Copper Project. Chapter 5 showed how the negative and antagonistic dimensions of certain claims, which were more prevalent among those residing closer to the proposed mine site, were disavowed through recourse to scientific and legal rationales in relation to hydrology and mining. From this analysis, the impression is one of a process that is overwhelmingly determined by these institutionalised rationalities of the state. It is a picture in which the socioecological and socioeconomic concerns of those most at risk are subordinated to more remote socioeconomic interests. As such, the NEPA EIS process appears as one whose democratic capacity is fundamentally constrained by these structures. This chapter, however, uncovers a wider terrain which is not necessarily one of dependence upon institutional procedures, norms and laws. Rather, it is one in which power and excluded antagonistic energies, such as those disavowed by the public commenting process, exert and reclaim agency through diverse networks and spaces of association.

Responding to RQ3, I draw upon a thematic analysis of archival materials, participant observation and interviews to highlight the role of the relationship between power, knowledge, discourse and action in respect to the Rosemont issue. Firstly, Section 6.1 discusses how the thematic nature of the public comments identified in Chapter 4 can be seen to reflect how discourses have been strategically framed, narrated and deployed by opposing coalitions of interests in respect to the proposed Rosemont Copper Project. Secondly, the themes identified in Figure 6.1 form the basis for the discussion in the subsequent sections, which describe examples from two main objects of contestation, 'science', and 'ethics'; and the significance of relations of 'power'. As discussed in Section 6.2, scientific arguments pertain to the rigour, scope and objectivity of the analyses conducted in assessing the potential socioecological impacts of the mine. Critically, however, this theme includes the particular rationality by which public involvement is facilitated. The examples of ethical controversies in Section 6.3, meanwhile, relate to moral conduct, bias, and the political-economic relationship between the Rosemont Copper Company and the Forest Service in the conduct of the EIS process. Finally, in Section 6.4, I focus on the specific set of relations between State-level (i.e. Arizona) institutional actors to further show how the influence of power and relative autonomy varied spatially. To aid understanding of the various state and non-state institutions, groups and actors

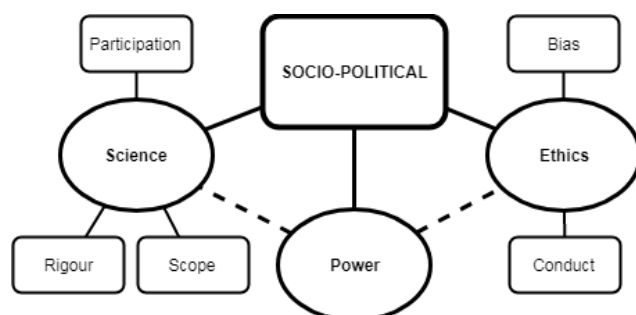


Figure 6.1 - Thematic map – the 'socio-political' domain

described below, Figure 6.2 (subsequent page) presents a schematic of the various hierarchical, discursive, economic, and associative relations between them across local to global scales.

### 6.1. Discourse, frames and narratives

The thematic nature of the public comments identified in Chapter 4 can be seen to reflect how discourses – understood as the ways in which texts and practices of their production and dissemination bring objects into being or the linguistic constitution of social reality (see Foucault 1979) – have been selected, framed, narrated and spliced together with the Rosemont situation to construct particular understandings and produce certain actions (Lindekilde 2014). The prominence of the socioeconomic, socioecological and water themes among public participants is discussed in respect to their strategic deployment by discursive coalitions engaged on the Rosemont mine debate. It is argued that the trajectory of the NEPA EIS process was firstly influenced by concerted efforts to frame and generate a dominant consensus on the mine. While proponents sought to portray the mine in sustainable and pragmatic terms (Section 6.1.1), and counter-efforts focussed on the multiple ways in which water mediated adverse impacts to humans and non-humans (Section 6.1.2).

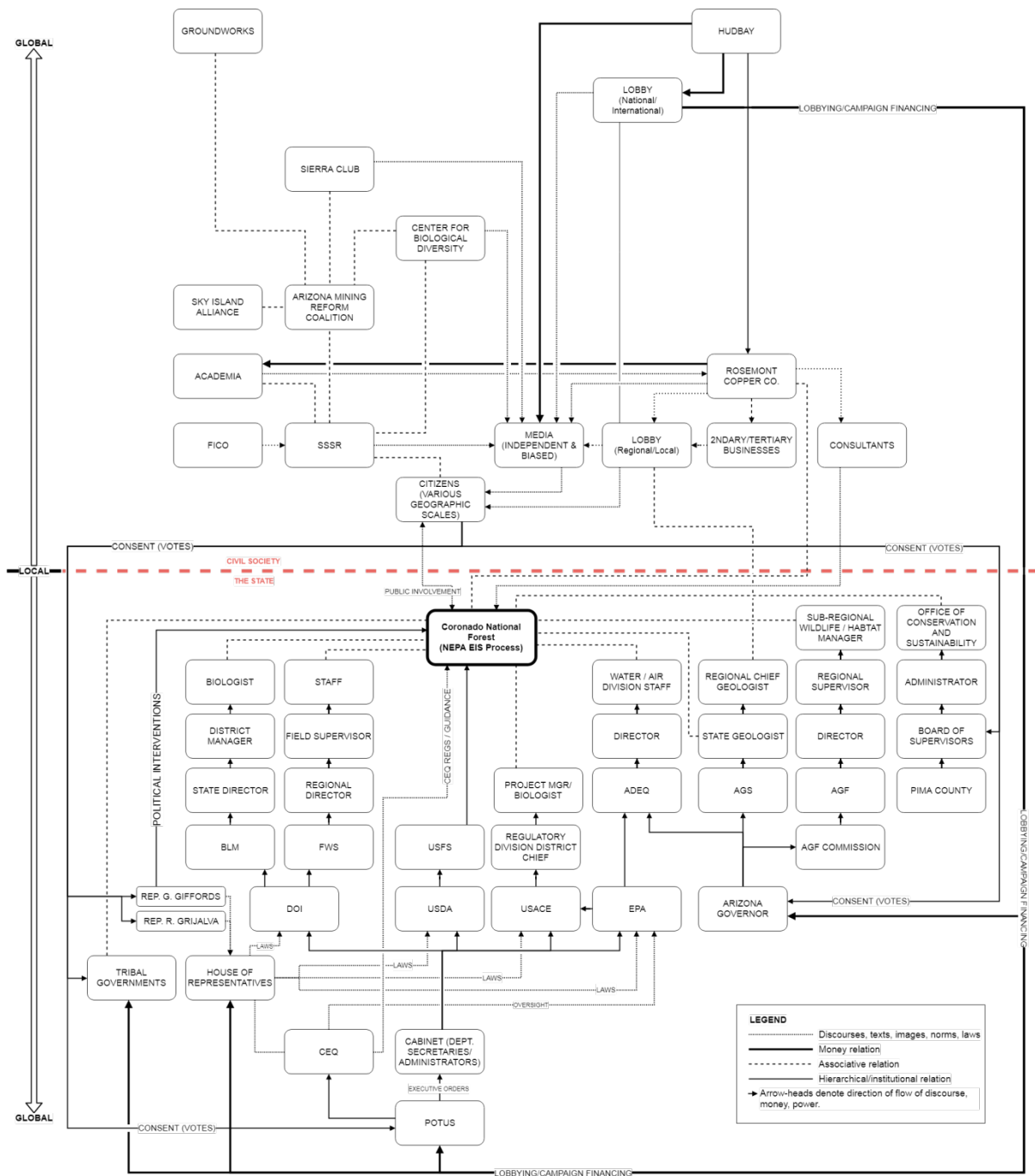
#### 6.1.1. Sustainable mining

In relation to the socioeconomic benefits of the proposed mine, the strategic effort for the proponents was aimed at countering pre-existing and emerging accounts of the environmental impacts mining in general and those specific to this case. As one respondent for the mining company, Rosemont/Hudbay, stated under interview:

We did lots of polling and messaging and spent a lot of time learning what people were concerned about and explaining the project. We gave 6,000 tours of the mine site, and many talks – for example at the Breakfast Club, Rotary Club, sometimes as many as seven talks in a week by 4 people. We are continuing to make sure to understand people’s concerns through on-on-one conversations. It is difficult to convey a message which supports a technical position in a fifteen-second soundbite, so we would give 30-minute presentations and have 30 minutes of Q&A. In not being afraid to answer questions, and not being afraid to ask questions we have been able to make the project better by identifying the issues which need addressing. We have to find ways to counter misrepresentative headlines and statements from oppositional groups.<sup>105</sup>

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<sup>105</sup> See interview notes: Appendix 18.15



**Acronyms (alphabetical order):**  
 ADEQ – Arizona Department of Environmental Quality  
 AGF – Arizona Game and Fish  
 AGS – Arizona Geological Survey  
 BLM – U.S. Bureau of Land Management  
 CEQ – President’s Council on Environmental Quality  
 DOI – U.S. Department of the Interior  
 EPA – U.S. Environmental Protection Agency  
 FWS – U.S. Fish and Wildlife Service  
 POTUS – President of The United States  
 USACE – U.S. Army Corps of Engineers  
 USDA – U.S. Department of Agriculture  
 USFS – U.S. Forest Service

**Figure 6.2 – Proposed Rosemont Copper Project: stakeholder map showing relationships between various state and civil society institutions, groups and actors across local to global scales.**

Examples of this effort are found in Rosemont Copper's video productions and advertisements, which were disseminated through social media and television. During the early stages of August Resource Corporation's ownership of the Rosemont site, attention was focussed on technical aspects of the mine's design and framings of how the environment would be protected. Using digital imagery, water management and land reclamation techniques through which the adverse environmental impacts of the project would be minimised and mitigated were depicted. However, these productions also placed a strong, somewhat anachronistic emphasis of the mining industry as integral to the history of the southwest, of Arizona and the local community. A narrative was thus presented of mining as a shared industrial and cultural heritage which must be reclaimed and preserved in the interests of the livelihoods of the people.<sup>106</sup> In public presentations, statistics showing the continued economic importance of the copper industry to the state and the nation were also linked to concerns for the environment through this historical emphasis, using the taglines: "Bridging Arizona's History to a Sustainable Future" and "Rosemont Copper: Building a Bridge to a Sustainable Future" (see Plate 6.1).

Hudbay's efforts, following their acquisition of Augusta and the mine site in 2014, were notable for a more nuanced approach. For example, in much of their material, they employed a kind of discursive frame inversion, in which the landscapes, ecological and hydrological resources that the project threatens are presented as a 'product' of the mine. Thus, imagery that plays on the links between the Santa Rita Mountains, its ecology and the people of the surrounding area appeared repeatedly in promotional videos. This included the backdrop of the mountain range for footage of hikers in the area; again for a family drinking jugs of iced water beside their swimming pool, with neighbouring golf course and pecan farm; and the use of the silhouetted profile the Santa Ritas in the banner for the Rosemont Copper logo (see Plate 6.2). Meanwhile, sequences of police officers; fire fighters; urban professionals; mothers and children stood outside schools; a resident stood beside a poorly-maintained Tucson street. Captions and narration quantify the local jobs, the tax revenues, and the struggling public services that the tax revenues from the mine will improve. Directly addressing key arguments of opponents, the viewer is informed that any adverse impacts are far less than those of other industries. Accordingly, advanced technologies and methods are exhibited, a new paradigm in

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<sup>106</sup> As Bridge (1998) writes, such narratives are supported and perpetuated in the region through mining fairs (notably often attended and promoted by the Arizona Geological Survey, a cooperating agency in the NEPA EIS process for the Rosemont mine) and mining museums, at which through "panning for gold in a water but, climbing on the huge tires of a 240-ton dump truck, photographing muscle-bound miners as they compete to drill, split and crush rock, or marvelling at the darkness in the plastic simulacra of an underground pit, the public is encourage to participate in the discourse, constructing and legitimizing it though their actions."

## Bridging Arizona's History To A Sustainable Future



### *Arizona's history is intertwined with mining*

- ☛ Provides 65% of U.S. copper on one quarter of 1% of state and federal land
  - ☛ Dozen Operating Copper Mines In Az.
  - ☛ 73,100 jobs in 2010 from Copper
  - ☛ Average mining base wage \$60,000
  - ☛ 34 % additional benefit package.
  - ☛ U.S. imports 35% of its copper needs
  - ☛ Imports mainly from South America
- (Approx. 30 miles SE of Tucson)

Plate 6.1 – Slides from presentation by Rod Pace, the CEO of Rosemont Copper to Building Owners and Managers Association (BOMA), which were also used in various presentations by Rosemont executives at, for example, mining events and academic institutions. Images reproduced with the permission of Hudbay Minerals Inc.

‘sustainable’ mining, through which the integrity of water resources and the natural environment will be preserved (see Plate 4.3).

These efforts to frame and create a narrative around the Rosemont mine can be seen as the discursive, visual and sensory superimposition of economic, cultural and technological ‘goods’ against an uncompromised ecological background. Much of this material responds directly to specific criticism of the proposed mine, particularly in respect to threats to water resources, which had – by the time of Hudbay’s take-over – become prominent in local and state media. Hence the relativising arguments, often offering favourable comparisons in respect to water use with ‘traditional’ mines, but also with recreational uses, or agricultural interests opposing the project. One particular target of this response was Farmers Investment Company (FICO), a pecan-farming operation using groundwater from the same Upper Santa Cruz Aquifer from which the mine plans to draw water, and which has contributed to the efforts of opposition groups such as Save the Scenic Santa Ritas (SSSR). Such contentions were reiterated by an interviewee from Rosemont/Hudbay when questioned during this research (see Box 4.1).<sup>107</sup> In so doing, proponents emphasise the use of ‘state of the art’, ‘21<sup>st</sup> Century’ modern technologies to mitigate impacts. The advertisements thus conclude by reasserting their commitment to “redefining mining,” and inviting the viewer to “take a look at the real Rosemont,” as opposed to the false Rosemont which had been portrayed by critics.

<sup>107</sup> See interview notes: Appendix 18.15



Plate 6.2 – Rosemont Copper advertisements: “Take a look at the real Rosemont...Rosemont Copper, redefining mining”; “Rosemont Copper are building a bridge to a sustainable future”; “Using advanced methods allowing it to use 50% less than traditional operations, or 1/3rd the water that Tucson city golf courses use, or 80% less water than a large agricultural project [...] we’ve already stored 8 times the amount of water for our projected annual needs.” Source: dhvids32 (YouTube), URL <https://youtu.be/9DkkszVcktw>; and hhetube (YouTube), URL <https://youtu.be/Oc2aSwPQN7c> [accessed 17/06/19]. Images reproduced with the permission of Hudbay Minerals Inc.





Plate 6.3 –Rosemont Copper advertisements. Narration including: “Imagine how \$19 million more a year in Tucson’s treasury could help our police and fire departments, and our underfunded schools [...] That’s how much Rosemont Copper would add to our local tax base annually. Money that could keep our police and fire protection strong, rejuvenate schools and help with some road repair. It’s just one more way Rosemont is being a good neighbour.”; “What defines a ‘local’ company? A management team made up of over 40 of your Tucson neighbours, including ten Arizona natives and six U of A graduates, many of whom are involved in the community in youth programmes and food drives [...] One project will add 2100 more local jobs.” Source: zebra1128 (YouTube), URL <https://youtu.be/WAjLGxU5MkY> [accessed 7/7/19]. Images reproduced with the permission of Hudbay Minerals Inc.

Thus, ‘pragmatic’ economic-ecological discursive framings were disseminated in the wider public sphere through advertising and public relations on an extensive scale. These activities were coordinated by the mining company through a discursive coalition of affiliated advocacy groups, political advisory committees (PACs), societies, and other organisations. Prominent were groups such as the Southern Arizona Business Coalition (SABC); the Society for Mining Metallurgy and Exploration (SME); and the Tucson Metro Chamber. Activities were often synchronised with phases

**Box 6.1 – Relativising arguments for water resource use and mining<sup>10</sup>**

The main competing demand for water in the upper Santa Cruz is for agriculture, and in the area particularly Farmers Investment Company (FICO). FICO have thrown up a number of roadblocks to the mine, however they use 25,000 acre-feet per year, and Rosemont will use 6,000 acre-feet per year. [...]he pecan wells draw down on the aquifer by 30-100 feet depending upon the measuring location.

We can do what we can do? We can’t manufacture water. And there will be mine waste created in this process. However, why is the CAP canal not covered to eliminate evaporation? Why haven’t covers been put on storage ponds? Do we need the Tempe town lake or other decorative uses? The impact of evaporative loss on water supply and salinity has been acknowledged. Why are Las Vegas allowed to use so much water in fountains? Atomising water increases evaporation considerably.



of the NEPA EIS process (with, as discussed in Chapter 6, often controversial results), and can thus be seen as a direct attempt to influence public engagements with those institutional participatory spaces. The SABC, in particular, distributed guidance on “what should I say,” at public meetings on the Draft EIS, accompanied by bullet-pointed arguments that reflect many of those already highlighted above (see Box 6.2).

The same framings were also prominent within the more discrete spaces of engagement, such as the industry rally, the barbeque, picnic, and fair. Here, however, cultural-economic themes were allied to anti-environmentalist sentiment, much of which was evident in the public comments in the Rosemont NEPA EIS process. Thus, proponents asserted the ‘necessity’ for mineral development and a pragmatic trade-off between production (represented as ‘jobs’ and ‘tax revenues’ rather than profits) and the environment. Meanwhile, characterisations were discursively constructed of opponents as ‘others’, invoking elitism, naïve environmentalism and/or nimbyism, and juxtaposed against ‘we’ identities around autonomy, freedom and quality of life of ‘the little guy’, and the ‘harsh realities’ of recent economic crises. These claims were often made alongside criticisms of hypocrisy on the part of opponents, who also own televisions, cars, mobile telephones etc. which require copper and other minerals to be mined; people who, as a Rosemont/Hudbay employee put in one interview, “want it all, but [...] don’t want to know where it comes from.”<sup>108</sup> Similarly, the narrative condemnation of federal interference in State affairs is allied to the establishment of community, State and regional (Arizonan/The Southwest/The West) social and natural history as synonymous with mining and an instrumental view of nature and ‘god given’ natural resources. In turn, the decline of the United States as a dominant global producer and exporter, the consequent reliance upon imported resources, and the decline of American industry and employment is broadly condemned as a result of failed economic and environmental policies.

Proponent groups employed a range of direct and mediated communicative approaches, including social media, websites, industry news and journals, letter drops, and events. Relationships among this discourse community were cultivated by Rosemont Copper, and through institutions such as, for example, the Tucson Breakfast Club (TBC). One of two invitation-only organisations for CEO’s and local business leaders established in the late 1970s, the TBC’s membership comprises one representative per business sector, including (at the time of this research) an employee of Hudbay/Rosemont. Meeting bi-monthly, the format of the meetings are typically 30 minutes of networking followed by a 30-minute presentation. Other members of the Breakfast Club included

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<sup>108</sup> See interview notes: Appendix 18.15

**Box 6.2 – Text of handout distributed by Southern Arizona Business Coalition (SABC) in advance of public hearings during Draft EIS commenting period.**

<p style="text-align: center;">US Forest Service Public Hearing – Draft Environmental Impact Statement November 12, 2011</p> <p><b>WHAT IS THE PURPOSE OF THIS HEARING?</b></p> <p>The Forest Service is holding this hearing to take public comment on the Draft Environmental Impact Statement they have prepared regarding Rosemont Copper’s proposed mine plan of operations.</p> <p><b>WHAT SHOULD I SAY?</b></p> <p>Start by introducing yourself; say where you live, maybe share how long you have lived in the area and any other information that ties you to the community. Share why you support Rosemont Copper. Use some of the ideas below. Reinforce the message with a personal story or opinion if you like. Don’t forget to thank the Forest Service for their hard work and for selecting a preferred alternative that will allow Rosemont Copper to operate.</p> <p><b>Rosemont Copper a 21st century mine, giving our community MORE of what we want, and LESS of what we don’t.</b></p> <p><b>Less Water</b></p> <ul style="list-style-type: none"> <li>• Through new water recycling practices and other new technologies Rosemont will use less water in its operation than other mines in the area and have a higher yield.</li> <li>• Rosemont Copper is committed to importing replacement water from the Central Arizona Project Canal to replace the ground water pumped for the project, which will ensure no losses of local groundwater through the life of the project, as well as guaranteeing the health of individual wells in the pumping vicinity.</li> </ul> <p><b>Less Land</b></p> <ul style="list-style-type: none"> <li>• Rosemont Copper will be among the most efficient mining projects in the world. Compared to other Pima County mines, Rosemont will yield more than double – in some case more than quadruple – the amount of copper per acre, on less than half the land area of other area mines.</li> <li>• The mine will operate on less than 4,000 acres of the more than 120,000 acres in the Coronado National Forest. When mining operations are complete, in conjunction with Rosemont’s reclamation plan, less than 1% of the total land that constitutes the forest will be affected.</li> </ul>	<p><b>More Jobs</b></p> <ul style="list-style-type: none"> <li>• In total, Rosemont Copper will produce an average of 400 direct jobs annually with an average \$59,000 income. In addition, the Arizona State Economic Study anticipates that Rosemont will stimulate an average of 1,700 indirect jobs annually. Over a 20-year period that’s 42,000 man-years of work!</li> <li>• Some may argue that 2,100 jobs aren’t that many jobs. Tell that to the construction worker or truck driver that has been out of work for an extended period of time and is trying to put food on the table.</li> <li>• These jobs will be created in a wide range of industries, from construction and real estate, to manufacturing and all types of services. This means new jobs and increased profits created at the local hotels, restaurants, grocery stores, insurance agents, doctors’ offices, and other businesses, resulting in a \$3.3 billion total increase in local personal income.</li> </ul> <p><b>More Tax Revenue</b></p> <ul style="list-style-type: none"> <li>• Local government will benefit from \$306 million in additional taxes over the lifetime of the mine; that’s more than \$19 million a year, which can go toward road improvements, public safety and other critical needs not being met due to the tough economic times we are currently facing.</li> </ul> <p><b>More Local Spending</b></p> <ul style="list-style-type: none"> <li>• Rosemont is committed to spending its money locally wherever possible. From sourcing local contractors, to employees. It is estimated that Rosemont will spend more than \$1.5 billion while the mine is in operation, resulting in more than \$700 million of local, privately funded, economic stimulus every year the mine operates.</li> </ul> <p><b>More Reclamation</b></p> <ul style="list-style-type: none"> <li>• Our reclamation plan is truly precedent-setting, taking place concurrently with operations so that it will be nearly complete when the mine reaches the end of its life cycle.</li> <li>• The plan calls for topsoil to be removed and saved for later use. Slopes will be limited to a natural 18 degrees, and re-vegetated over the course of mine operations using replaced topsoil. Rosemont is presently cooperating with the University of Arizona on scientific investigations to optimize native plant reseeding strategies and plant salvage to ensure a successful, natural reclamation to permanent open space.</li> <li>• To ensure Rosemont lives up to its financial commitment, bonds will be put in place to cover all costs of reclamation and clean-up prior to the start of construction and operations.</li> </ul>
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the President of University of Arizona (UA), and the president of Pima Community College (PCC), two institutions which have been of particular interest for Rosemont/Hudbay. Pima Community College has annually funded 10 mining scholarships at a cost of \$20,000 as a result of the relationship cultivated at this event.

Meanwhile, “strong links” were forged between Rosemont/Hudbay and UA, including working with Department of Mining and Geological Engineering to provide information on the Rosemont Copper Project for classes.<sup>109</sup> The mining company also invested approximately \$1million in a partnership for UA research on revegetation with the School of Natural Resources and the Environment for projects, including student work field plots on the Rosemont site and a campus greenhouse. The proprietary research was to pre-empt any contention with the lead and cooperating agencies in relation to the operation of the mine and the ‘reclamation’ stage, and Rosemont/Hudbay have also made the publication of academic papers, in collaboration with UA, a priority.<sup>109</sup> References to such activities have been ubiquitous in the company’s public relations efforts, in particular linking the project to the education and future livelihoods of local young people.

#### 6.1.2. Water, land and people

Just as mining interests in the proposed Rosemont Copper Project were able to establish and tap into a network of relations through which to legitimise and discursively frame issues around the proposed mine, a well-established community of scientists, academics, artists and environmental activists were equally well equipped to contest the basis for the project as set out in the Draft EIS. Historical links between the metropolitan, cultural academic, scientific and institutional hub of this region and the area surrounding the mine site are also significant. Many of the key informants interviewed for this research were graduates of natural science disciplines at the University of Arizona, and went on to careers with local government agencies, ‘conservation’ NGOs. In many of these trajectories, these individuals have been involved in environmental research in the same area threatened by the Rosemont mine. Some were involved in the establishment and management of designated areas such as Las Cienegas National Conservation Area, or Cienega Creek Natural Preserve. These projects often involved local artists and established links with other practitioners in media and academia. Some have also been engaged in previous campaigns to protect these environments from development, and have personal connections to organisations such as SSSR. The renewed network of relations that emerged around the Rosemont Copper Project proposal, therefore, often bisected the boundaries between the personal and the professional, the

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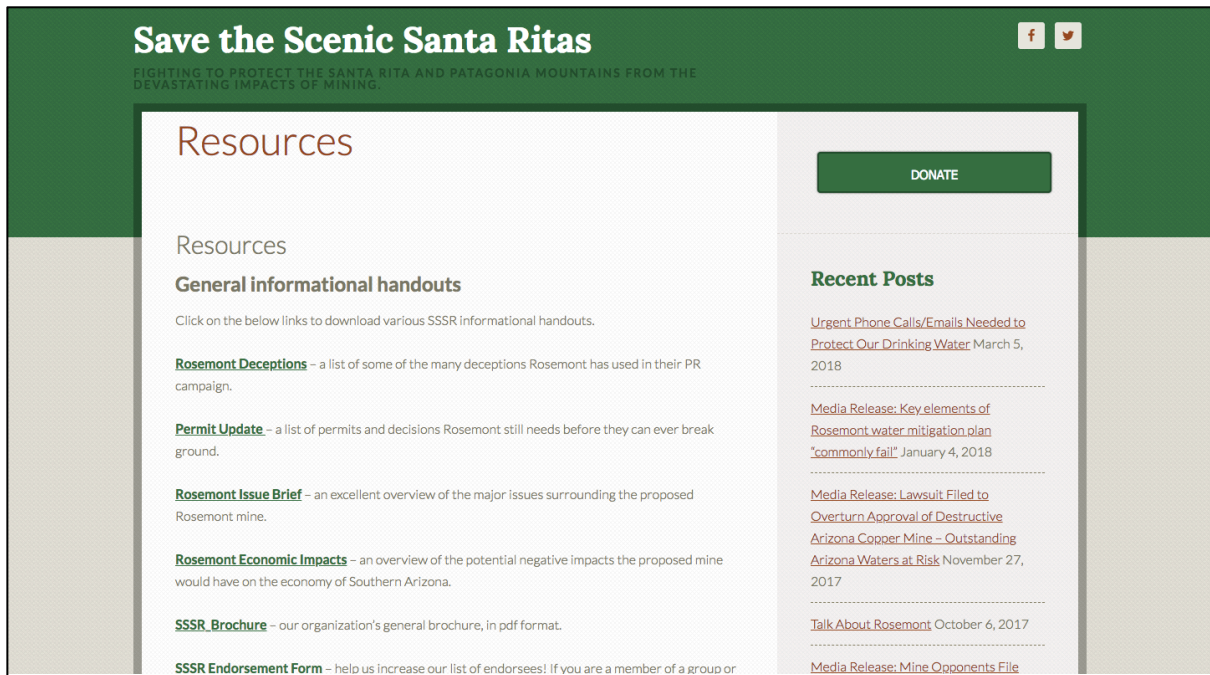
<sup>109</sup> See interview notes: Appendix 18.15

institutional and the private, the state and civil society. Moreover, it extended beyond Tucson to the immediate vicinity of the mine site, to the Cienega Creek watershed and the upper Santa Cruz valley (or Zones 1 and 2, in the thematic analysis) incorporating a socially and politically active group of the resident community. For these citizens, the integrity of the environment in which they live holds both cultural and economic value. Consequently, tensions emerged between inherent values for nature and species; cultural values of a recreational, spiritual or aesthetic nature; and economic values for private property, local recreational and tourism businesses. Community interests in Rosemont site and its surrounding environs were thus of both an intrinsic and instrumental nature.

Diverse networks of individuals, communities, businesses and groups operating at different spatial scales with overlapping interests have thus coalesced, dispersed and reorganised around a succession of social and environmental conflicts in the region, including specifically around the Rosemont mine site and the surrounding area. Perhaps the most significant group has been SSSR which, between formation and the current iteration of the Rosemont Mine, have mustered a considerable network of financial and intellectual resources, including a leadership with strategic, scientific, legal and political expertise and a local activist base of predominantly middle-class, retired (and thus otherwise unemployed), highly-educated, environmentally conscious, former civil servants, scientists, academics and professionals.

Close ties were formed between SSSR and a number of other local, regional, national and international organisations through the Arizona Mining Reform Coalition, including NGOs such as Earthworks, the Sierra Club, Sky Island Alliance and Center for Biological Diversity (CBD). Through such relationships, the knowledge, resources and labour required to gain public, institutional and political support for opposition to the Rosemont mine were produced and pooled. This included the production and dissemination of alternate, but legitimate, scientific surveys, analyses and opinion around key issues of public interest and, and highlighting scientific and ethical controversies. This also contributed to the production of extensive reports, which were themselves submitted by the groups as public comments at the scoping, Draft EIS and Final EIS stages, and, in turn, disseminated to the wider public for their information (see Plate 4.5). The NGOs were the major commissioners of scientific knowledge to this end, lending a form of institutional legitimacy to the discursive products of this effort, which were subsequently disseminated by themselves, and via SSSR and other affiliated groups – who would often frame these materials in terms they considered most impactful among their members and ‘subscribers’.

Online platforms, including websites (see Plate 6.4) and social media (such as Twitter, Facebook and YouTube) have been crucial to this effort, along with email lists, posters, flyers, events and press



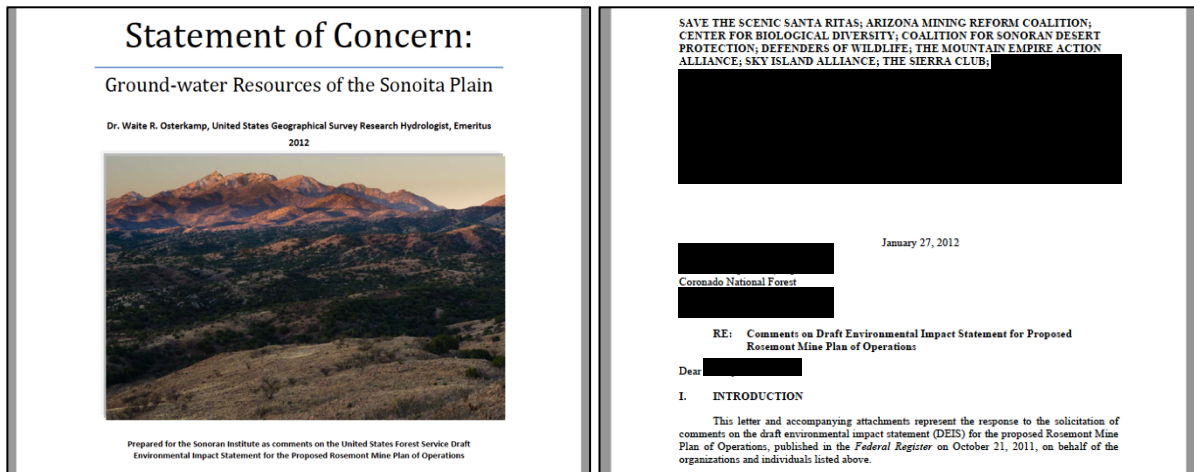
**Plate 6.4 – SSSR website, with links to resources such as informational handouts, news updates, links to social media. Image reproduced with the permission of Save the Scenic Santa Ritas.**

releases. Its aim being to stimulate and inform public discourse and engagement in the NEPA EIS process and to exert pressure upon institutional and political actors and organisations. All of these platforms were used to relay updates on the progress of the EIS process, report on significant and controversial events, link to new studies or reports relevant to the issue, encourage action of various sorts, along with other updates. Similar to the tactics employed by proponents, pro-forma letters (or ‘form letters’) and ‘what should I say?’ or ‘how to comment’ guides were provided in advance of the public scoping and Draft EIS commenting period.<sup>110</sup> Meanwhile, readers were encouraged to contact executive, federal-level institutional decision-makers – such as at the Council on Environmental Quality, the Environmental Protection Agency and the Army Corps of Engineers<sup>111</sup> – and congressional representatives to convey their concerns about the proposed Rosemont Copper Project.

Through such means effective counter-framings to those of the proponents for the Rosemont mine have been asserted. These discourses have been characterised by a distinction between scientific arguments on the one hand and ethical arguments on the other. The former relate to claims relating to the rigour and scope of the analyses of socioecological and socioeconomic impacts, which predominated in the content of the public commenting process for the Draft EIS. They highlighted

<sup>110</sup> See Appendix 16.1

<sup>111</sup> See Appendices 16.2 & 16.3



**Plate 6.5 – (Left) Groundwater report prepared by Dr. Waite E. Osterkamp for the Sonoran Institute for submission as comments on Draft EIS. Reproduced with the permission of Sonoran Institute; (Right) 170-page report prepared by coalition of groups led by SSSR submitted as comments on the Draft EIS. Reproduced with the permission of Sonoran Institute, Save the Scenic Santa Ritas, and Brian Powell (author of inset picture).**

the potential scale of impacts upon specific ecological and instrumental interests in the environment. Thus, as well as the tourism industry and property values, they focused particularly on the root causes of concern for these matters, water and its mediating ecological function. Water quality, hydrology and the impacts on the Cienega Creek watershed was related to the subsequent impacts upon groundwater tables and domestic wells; but also the implications for such designated waterways in terms of endangered species and habitats.

Therefore, it is not water itself, but the entities, objects, systems and phenomena within which water is embodied, which have frequently been the focus of oppositional arguments in relation to the Rosemont mine. Simultaneously, the spatial, temporal and elemental materiality of water itself (its abundance, scarcity, composition, flow) mediates, signifies and embodies these ‘things’, within a hydro-social cycle which connects the global to the local and the human to the non-human. Water issues thus often resolve down to individual objects of concern, such as endangered species of plant, or animal referred to (often somewhat critically) as ‘charismatic megafauna’. One such species, the jaguar, and its protection under the *Endangered Species Act* of 1973, was of particular concern to respondents on the Draft EIS. The prevalence of concern for the jaguar reflected its foregrounding by CBD as the talisman for its opposition campaign. During the Draft EIS public commenting process, the NGO distributed its own pro-forma letters, intended to assist members of the public in submitting comments to the Forest Service. Among a range of issues relating to biological resources, the sample letters – which were variously copied verbatim or paraphrased by respondents, adding





Plate 6.6 – Clockwise from top left: (1) Screenshot of footage of US’ ‘only known wild jaguar’ from survey that received worldwide media coverage including BBC; (2) ‘Rosemont Ours: A Field Guide’ interpretive dance performance video project by local artists (directed by Kimi Eisele); (3) ‘Lens on the Land’ photomural installation; and (4) photographic exhibition by SSSR, Sky Island Alliance and Sonoran Institute. Photographs reproduced with the permission of: (1) Chris Bugbee and Conservation CATalyst; (2) Ben Johnson, Kimi Eisele and ‘Rosemont Ours’ project; (3) & (4) Josh Schachter.

their own signature – specifically referred to the potential impact to jaguar and the wildlife corridors which form jaguar habitat.<sup>113</sup>

Meanwhile opposition groups and organisations re-established links and initiated projects in cooperation with local artists, activists and journalists in order to engage the wider community, or as one local artist put it “broaden the audience using various creative pathways [...] us[ing] art as an advocacy tool.”<sup>114</sup> The outputs of these collaborations included art and photography exhibitions, installations, performances and media. Much of this work sought to highlight, visually, artistically and through forms of reportage, the unique characteristics of the proposed mine site, its ecology, and the species that inhabit the area. Cultural values for elements of the natural landscape of the area were both implicit (for example, through the medium of dance) and explicit in much of this

<sup>113</sup> See: <http://www.thepetitionsite.com/takeaction/887/067/357/> [accessed 07/06/17] and <https://www.facebook.com/events/967551703278329/> [accessed 07/06/17]

<sup>114</sup> See interview notes: Appendix 18.13

work, often placing an emphasis on ‘the land’ as something to which people attach a sense of place and connection. In particular, tribal connections were a focus, in both a photographic project entitled ‘Lens on the Land’ (see Plate 6.6, previous page) and a short documentary on the Tohono O’odham people entitled ‘Ours is the Land’ (see Plate 6.7).

Given that [...] a photographer who used to work for Sonoran Institute, was used to help establish the Las Cienegas NCA Act, the team were aware of the power of art, narrative and cultural story to push policy change. The first step was to engage [the photographer] to create a photo narrative of what is at stake [...] It’s difficult for people who have not experienced Cienega Creek themselves to engage on an issue through numbers and statistics. You can use art to hit them where they can visualise what the future’s going to look like for their children and grandchildren. We have a history of creating shared space for communities to engage in issues. We branded this strategy as a product called *Lens on the Land*. Sky Island Alliance also got involved in the project, alongside Save the Scenic Santa Ritas [...] a coalition of people working on the issue.<sup>115</sup>

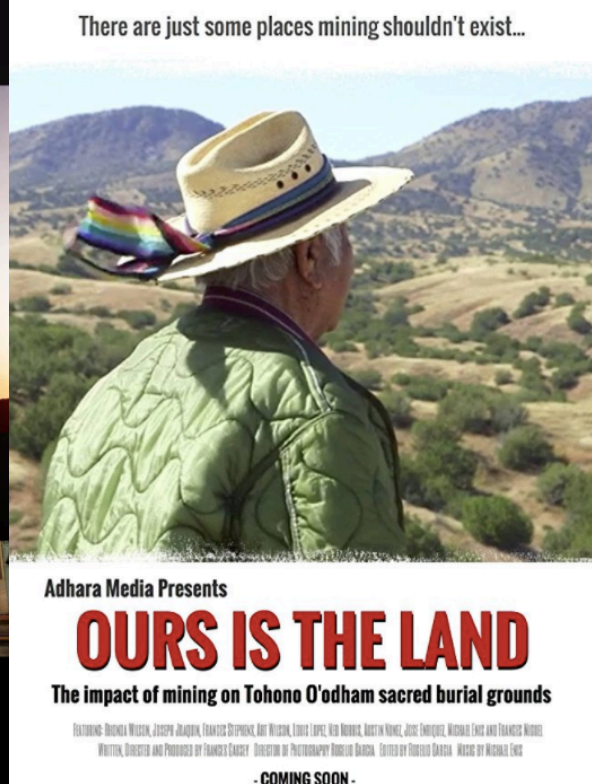


Plate 6.7 – Two documentaries relating to the Rosemont Copper Project: *Flin Flon Flim Flam* (left), an ‘expose’ of the allegedly unethical activities of Hudbay in South America; and *Ours is the Land*, a documentary of the relationship between the nearby Tohono O’odham tribe and the Santa Rita Mountains. Images reproduced with the permission of John Dougherty (left) and Frances Causey (right).

<sup>115</sup> See interview notes: Appendix 18.4



## 6.2. Science

The scientific aspect of the socio-political domain can be characterised according to three themes, in relation to which the socioecological risks and benefits of the proposed Rosemont Copper Project have been re-politicised by different groups: participation, rigour, and scope. This section thus begins with the 'Patagonia Riot' – the ironically-dubbed confrontation between local citizens and the Forest Service (described at the beginning of this thesis) – in which the institutional rationale for public involvement in a 'scientific' decision-making process itself became an object of public resistance and political intervention. This is followed by examples of how locally-embedded and relatively autonomous institutional actors have contested the rigour of abstract rationales relating to what the Forest Service refers to as "best available science." Finally, I focus on debates over the scope of the scientific analyses in relation to the consideration of impacts to endangered species. Of significance here is how environmental NGOs are able to generate public support around particular species, mustering significant resources of scientific and legal expertise to alter the trajectory of the EIS process.

### 6.2.1. Participation: the Patagonia Riot

The public scoping period, which commenced immediately following the public announcement of the submission of the Rosemont mine proposal in March 2008, was the first opportunity for the public to be involved in the NEPA EIS process. It was the third 'open house' public scoping meeting, held at the Patagonia High School in Santa Cruz County, Arizona on 20<sup>th</sup> March 2008, which culminated in the 'Patagonia Riot'.<sup>116</sup> In many respects, this emergent 'hot situation' was a portent for the discursive and political struggles that emerged over the following decade. Indeed, as this chapter argues, the 'Patagonia Riot' represented the first of series of events through which the Rosemont Copper Project was 're-politicised'. In this instance, the issue was not primarily the content or the matters of concern in relation to the proposed mine (although that was the reason for the attendance of the individuals in question), nor the scientific rigour and scope of the analyses conducted (as discussed later in this chapter), but the format of the 'open house' meetings themselves.

The Forest Service's Scoping Summary Report into the 'Extent of Public Participation'(CNF 2009a) states that the open house format was designed to allow attendees to:

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<sup>116</sup> Patagonia is a former mining town 40 km south of the proposed mine site.

view informational displays, ask specialists about the Rosemont Copper Project and the EIS process, and submit written comments on-site [...]

Members of the public were provided with sign-in sheets, comment forms, fact sheets, and displays. Participants were encouraged to join the mailing list by signing in. The fact sheets and displays provided information about the following:

- the NEPA EIS process;
- the scoping process;
- how to comment effectively;
- applicable laws and regulations;
- location maps; and
- the proposed MPO<sup>117</sup>

The three open house meetings attracted a total of 649 attendees. In addition to the written submissions solicited at the meetings, public comments were also subsequently accepted on a phone line and by mail, hand delivery, facsimile, and email throughout the 30-day scoping period. Reflecting the 'significant' and 'substantive' standard set by the CEQ and in the FSH, the Forest Service emphasised in the NOI issued in advance of the scoping process that

[c]omments should be directly related to issues associated with the proposed action, rather than general advocacy of or opposition to the project, to best assist us in the NEPA analysis [...]

Attending the Patagonia event, set in a school hall, were 182 members of the public, including local residents and people affiliated (formally or informally) with various interest groups. The venue itself was organised and paid for by Rosemont Copper, notably including the attendance of law enforcement. The space was split into 'exhibit tables' attended by Forest Service staff and consultants with display boards. As well as answering one-on-one questions, staff distributed leaflets and public comment forms to be completed by the participants. The fact sheet on 'how to comment effectively' which accompanied the comment forms stated that "[t]o be effective, comments should be specific and factual [...] Statements such as 'Don't do this' or 'I like this' are not useful in generating issues that can be analysed."<sup>118</sup> These articles, and this event, exemplify the democratisation of environmental governance as performed under NEPA. As described before the introduction to this thesis, however, on that particular day the Forest Service's interpretation of what constituted democracy was roundly rejected by the participants.

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<sup>117</sup> See Appendix 6.10

<sup>118</sup> See Appendix 6.11, page 60

For the participants, the format of the ‘open house’ meetings were a blatant attempt to fragment collective passions and moderate input, or, as one respondent put it, a means to “divide and conquer” the collective voice of those attending.<sup>119</sup> Thus, the discursive de-politicisation exemplified in Chapter 5, through which antagonisms toward the Rosemont Copper Project were excluded and disavowed, was thus supplemented by a form of micro-spatial de-politicisation in the public ‘open house’ meetings. Notwithstanding provisions made for the public to submit written comment forms, the scope for immediate and verifiable feedback on their concerns was restricted, with interactions limited to the reception of visual and verbal information. The information boards, charts and comment slips, attended by Forest Service employees, were insufficient to satisfy people’s desire to ‘have their say’.<sup>120</sup> For a number of participants, a feeling of having been “left out” due to a failure to communicate and manage expectations effectively in relation to the meetings on the part of the Forest Service, combined with “mistrust, apprehension, and [...] anger” arising from the conduct of the Rosemont Copper company culminated in the events in Patagonia.<sup>121</sup> As described in Section 6.2, the ‘hot situation’ which emerged in Patagonia can be seen as a culmination of a number of ethical grievances relating to the conduct of the proponent and the Forest service.

However, the Patagonia Riot must also be considered in respect to the established network of actors and organisations through which engagement in the Rosemont issue was generated. As well as concerned individual citizens, the opposition group Save the Scenic Santa Rita’s (SSSR) was instrumental in organising attendance at meetings and participation in the NEPA EIS process. As discussed in Chapter 4, SSSR had established strong links with the Grand Canyon Chapter of the Sierra Club through the Arizona Mining Reform Coalition (see Figure 6.2). In 2004, the Sierra Club had challenged the Federal Highway Administration’s use of the ‘open house’ format in lieu of the more traditional ‘public hearings’. While the argument was rejected by the court, it nevertheless observed that open houses “limit the opportunity for citizens to directly and publicly confront agency decision-makers with opposing views” (Spensley 2014: 585). Strategically, therefore, the knowledge that some traction could be gained by contesting the ‘open house’ format was transposed from one case to the other. The Patagonia Riot drew further media and public attention to the Rosemont Copper Project, attracting the support of political figures, who were able to impel the Forest Service to change the format of the public meetings and extend the public scoping period in mitigation for its previous failures, thus stymieing the NEPA EIS process.

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<sup>119</sup> See Appendix 18.10

<sup>120</sup> See Appendix 18.26

<sup>121</sup> See Appendix 6.1 – Forest Service email chain

The open house meetings are an example of the “para-political” (Swyngedouw 1999), scientific disavowal of oppositional critique, through the construction of a space of engagement and a ‘substantive’ rationale for valid participation. The transmissive format and the restrictive definition of rationality that determined the validity of public comments correspond to the ‘Public Education Model’ of public participation (Callon 1999). For Callon (1999: 84), the aim is for “educative and information actions” to move the perceived risks of an ill-informed, irrational public closer to the objective risks as framed by certified science. “Once the emotions and beliefs clouding their minds have been dispelled”, Callon writes, “the citizens or consumers are in a position to take rational decisions” (ibid.). Such an arrangement would correspond to a point somewhere between what Arnstein (1969) placed on the third and fourth rungs on her ladder of citizen participation: ‘informing’ and ‘consultation,’ both of which she categorises as ‘tokenism’. Indeed, considered in the context of a space of engagement framed by conditions of acceptable levels of scientific discourse, it is arguable that Arnstein may have equated the NEPA EIS process in this instance to ‘therapy’ and outright ‘manipulation’. Indeed, such a claim is less contentious when viewed in light of some of the conflicts of interest inherent to the mining company’s role in the Forest Service’s EIS process, notwithstanding the instances of unethical yet legal conduct by Rosemont Copper over the course of the process (as discussed later in this chapter).

Nevertheless, the ‘Patagonia Riot’ had significant ramifications for the trajectory of the NEPA EIS process. Following correspondence from constituents and local government officials of the 8<sup>th</sup> Congressional District of Arizona, which then incorporated the mine site and much of the surrounding area, Representative Gabrielle Giffords intervened. In line with written requests from Giffords, the Forest Service extended the scoping period from 30 to 120 days and hosted three additional open house meetings in April 2008. Furthermore, the agency agreed to give brief presentations at the meetings providing an overview of the proposed mine and the NEPA EIS process, and arranged for Rosemont Copper representatives to attend and field questions from the public, the absence of the latter being a major point of contention among attendees at the previous meetings. In addition, and perhaps most significantly, three additional ‘public hearings’ were arranged for May and June 2008.<sup>122</sup>

The CEQ handbook names ‘public hearings’ as a type of meeting which are run in a “formal manner, with a recording or minutes taken of speakers’ comments.”<sup>123</sup> In this instance, the format included formal presentations from the Forest Service on the proposed action and the NEPA EIS process. The

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<sup>122</sup> See Appendix 6.10 – Scoping summary report

<sup>123</sup> See Appendix 22.2

presentations were to be followed by an opportunity for individual members of the public to speak, with each speaker given three minutes to make comments on the proposed mine. The public hearings were collectively attended by 860 individuals. Comments were received from the Tohono O'odham Nation; Federal, State, and local agencies; organized interest groups; businesses; and individual members of the public. At the first of the hearings, in addition to the comments made by members of the public, Representative Giffords and Pima County Supervisor (District 4) Ray Carroll also made their own representations.<sup>124</sup>

A further joint intervention by Representative Giffords and Representative Raul Grijalva responded to continued public confusion over the process, and cited concerns for the apparently prejudicial wording of the original public notification of the project in stating that the purpose of the Forest Service action is to “grant permission to the Company to use NFS land for certain activities related to the operation of the Rosemont Mine.”<sup>125</sup> While the suggestion that the scoping process should be re-started went unheeded, the original 30-day scoping period which was due close on 12<sup>th</sup> April, was in fact extended to 1<sup>st</sup> August 2008. By the time that period had ended, the agency received 11,082 comment submittals from the public.<sup>126</sup>

While the new format for the public meetings allowed a more direct confrontation between antagonistic publics and decision-makers, the Forest Service's ‘significant’ and ‘substantive’ standards for public comments meant that those concerns which could not be scientifically verified were either excluded from the process or, as discussed in the previous chapter, disavowed in the agency's mandatory responses. According to the key informant for the Forest Service, “[t]he majority of comments received were statements of support or opposition, which were often not supported by a great deal of rationale. There was a large number of letters submitted... [so] this took a lot of time to dig into.”<sup>127</sup> In tandem with the restrictive format of the ‘open house’, this process not only precludes the assertion of intrinsic values and preferences which may fundamentally be incompatible with the proposed development – thus ‘deconflictualising’ the participatory process – but enforces a scientific rationalism which is beyond the capabilities of many unofficial actors to engage with or challenge. This framing corresponds with the Forest Service's repeated assertion that

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<sup>124</sup> Video recordings of the latter two representations and a selection of oppositional statements can be viewed at <https://www.youtube.com/user/azoberth/videos>.

<sup>125</sup> See Appendix 11.3.1

<sup>126</sup> See Appendix 6.10

<sup>127</sup> See interview notes: Appendix 18.11

the public commenting process should not be interpreted as a ballot in which members of the public can ‘vote’ in favour of or opposition to the mine.<sup>128</sup>

#### 6.2.2. Rigour: hydrosocial refugia

A key theme emerging from Chapter 4 was the level of uncertainty over the hydrological and water quality impacts of the proposed mine. As detailed in Chapter 5, despite mitigation measures, the institutional response to public concerns for the implications for private wells, and riparian/aquatic ecosystems was predominantly one of disavowal. This response was justified on the basis of the status of these uncertain scientific analyses as the ‘best available science’. However, the value of habitats such as Cienega Creek was not only a matter of concern for private citizens. The importance of these issues was mirrored by locally-embedded institutional actors – the scientific practitioners responsible for the analysis in the EIS – within the confines of the committee of cooperating agencies. Indeed, the Final EIS acknowledges that there was “significant disagreement” between the Forest Service and the cooperating agencies about the severity of hydrological impacts that could impact perennial and intermittent streams. In particular, one key informant for the Bureau of Land Management (BLM) highlighted considerable tension with the Forest Service over the spatial and temporal extent of the analysis of ‘cumulative impacts’ in relation to the hydrological effects of the mine. Indeed, the level of disagreement was such that the U.S. Institute for Environmental Conflict Resolution, which was established for the purpose of resolving the types of environmental conflict often involved in NEPA EIS processes, were called upon to mediate.

Such tensions emerged controversially into public view in May 2015, when a press ‘freedom of information’ request resulted in the publication of a number of internal correspondences from the BLM staff. The memos highlighted significant disagreement with the Forest Service over the models used to simulate potential hydrological impacts of the Rosemont mine upon the BLMs *Las Cienegas National Conservation Area*.<sup>129</sup> The Arizona Daily Star (ADS) article, headlined ‘BLM: Rosemont Mine plans worrisome now, just like before’, was corroborated directly with a key informant for this research, specifically addressing concerns around the hydrological modelling. Under interview, the respondent highlighted that “a proper investigation should involve the drilling of more core samples”, arguing that “the result was a hydrological model with a high level of uncertainty.” Adding that the models were done by consultants under contract with the mining company, the respondent

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<sup>128</sup> See Appendix 6.10

<sup>129</sup> See: [http://tucson.com/news/science/environment/blm-rosemont-mine-plans-worrisome-now-just-like-before/article\\_cc59f17a-00cb-5276-9bec-ff40e84d0230.html](http://tucson.com/news/science/environment/blm-rosemont-mine-plans-worrisome-now-just-like-before/article_cc59f17a-00cb-5276-9bec-ff40e84d0230.html) [accessed 13 June 2016].

continued “[y]ou could say that the mining company has an interest in maintaining this level of uncertainty, rather than undertaking a more detailed investigation which reveals a problematic reality. One of the main arguments put forward by proponents of the mine and the modellers is ‘how much money are you going to spend to prove a negative?’”<sup>130</sup>

The publication of positions which contradict the EIS led to further tensions with the Forest Service and within the hierarchy of the BLM. These documents appeared to contradict public statements by the latter agency’s District Manager that the Forest Service had addressed concerns relating to the hydrological modelling. According to the respondent for the BLM, reports of the BLM “agitating” the process had previously come to the attention of the then-national Director of the federal agency. The director had made it clear that the Forest Service are a “sister agency,” and that staff should not be communicating views such as those in the memos revealed by the ADS article by email. Emails are “vulnerable to the Freedom of Information Act,” the respondent highlighted, but verbal and informal exchanges remain “fuzzy” and easier to disavow. Nevertheless, the respondent highlighted the intrinsic motivations behind their individual actions in relation to the NEPA EIS process for the mine:

In this region, wetland habitats are almost gone. Cienega Creek is an ecological treasure trove [...] With the number of endangered and native species that could be affected by reducing ground water levels by even a small amount, building the mine would be like sinking Noah’s ark [...]

As a resident of Tucson and someone personally and professionally attached to the impacted area, this respondent highlighted that he makes sure that [their] children know what he does and its importance. Thus, while a federal employee, the position of this particular key informant as deeply embedded in the local community and environment of the area implicated by the proposed mine is a significant factor in that individual’s actions as a member of the NEPA committee. When asked whether he has a personal investment in Cienega Creek (which flows through the BLM’s Las Cienegas National Conservation Area, immediately to the east of the mine site), the respondent replied that [they] “would have to say yes.” This key informant expressed hope of making “enough of an impact [on the NEPA EIS process] that rational decisions can be made, so that the ecosystems remain intact and that future generations can benefit from them.”<sup>131</sup>

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<sup>130</sup> See interview notes: Appendix 18.8. The latter quote corresponds to the contention of one respondent for the Arizona Geological Survey, who, in defending the appropriateness of the hydrological models employed, suggested that some of the issues raised are “trying to prove a negative [...] that there may be something out there. As opposed to saying, if there’s a problem let’s identify it and fix it, or say you can’t go forward.” See interview notes, Appendix 18.16.

<sup>131</sup> See interview notes: Appendix 18.8

At the wider institutional level, meanwhile, conflict grew between four agencies in respect to the potential water quality impacts of the mine, namely: the United States Environmental Protection Agency (EPA), the United States Army Corps of Engineers (USACE), the Arizona Department of Environmental Quality (ADEQ), and the Forest Service. These tensions related to two federal environmental laws, the 1974 *Safe Drinking Water Act (SDWA)* and the 1972 *Clean Water Act (CWA)*, responsibility for which the EPA respectively delegates to state-level environmental agencies (in this case the ADEQ) and the USACE.<sup>132</sup> In relation to the former, the ADEQ transposes the requirements of the SDWA into its Aquifer Protection Permit (APP), which it issued in April, 2012.<sup>133</sup> The EPA – which works closely with the USACE in analysing the water quality impacts to ‘Waters of the United States’<sup>134</sup> under the CWA – voiced strong concerns about this decision in a letter to the Forest Service. With the NEPA EIS process effectively acting a repository of the combined assessments of all applicable environmental laws, the EPA stated that the Draft EIS failed to assess and mitigate for impacts to the ‘Outstanding Arizona Waters’ status for Davidson Canyon and Cienega Creek. Potential pollution of ‘waters of the United States’ protected by the CWA, it argued, were underestimated.<sup>135</sup> The position of the EPA was emphasised in a series of further correspondence, in which they asserted:

- the ADEQ’s APP approval “relies on limited, voluntary (i.e., non-enforceable), post-discharge monitoring that may detect water quality degradation after it occurs.”<sup>136</sup>
- the numerous conditions that ADEQ imposed on the mine are “highly unlikely to avoid potential water quality degradation, detect anticipated or unanticipated degradation or mitigate for those impacts.”<sup>137</sup>

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<sup>132</sup> The corps are required under the CWA to analyse the five ‘action alternatives’ (excluding the ‘no action alternative’) identified by the Forest Service in order to determine the ‘least environmentally damaging practicable alternative’ in light of cost, logistics, and technology. In their report for the final EIS, the Corps concluded that the Forest Service’s Alternative 4 (Barrel Alternative) represents the lowest comparable direct and indirect effects to WUS. However, while the alternatives analysis under Section 404 is intended to ensure that no discharge is permitted “if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem”, this is contingent upon such an alternative not having “other significant adverse environmental consequences.”

<sup>133</sup> The APP regulates potential seepage from mine tailings and waste rock facilities, requiring the use of best available demonstrated control technology to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer. It also establishes water quality limits for discharges to the aquifer, and requires monitoring, reporting, contingency planning, and financial assurance.

<sup>134</sup> ‘Waters of the United States’ defines all bodies of water that fall under U.S. federal jurisdiction according to a set of criteria.

<sup>135</sup> The letter was signed by District 9 Regional Administrator, Jared Blumenfeld – See Appendix 5

<sup>136</sup> See Appendix 5

<sup>137</sup> See Appendix 5



- and that “[t]he project’s projected groundwater drawdown and flow and sediment reductions in Davidson Canyon have yet to be adequately addressed.”<sup>138</sup>

The agency further stated that an approval of the Section 404 permit by the USACE would have “substantial and unacceptable impacts to ‘aquatic resources of national importance’, including Cienega Creek and Davidson Canyon.”<sup>139</sup> “In my biological opinion” said one federal agency respondent during this research , “[the analysis for the APP] could have done much more, required more controls and better monitoring.” Similarly, the issue of the adequacy and uncertainty of the hydrological modelling carried out for the programme is one that will be addressed “as a public interest issue [...] Impacts upon ‘waters of the U.S’. must be mitigated,” the respondent stated.<sup>140</sup> Separately, the EPA assigned its lowest possible ‘rating’ in its own comments on the Draft EIS, and recommended that a revised or supplemental document should be completed to address “significant inadequacies.”

For their part, the EPA further stated they would move to preserve their option to seek higher level review of the USACE’s Section 404 pending permit decision. In the event of an approval, the EPA would thus refer their opinion to the Assistant Secretary for the Army (ASA) for review, who would instruct the USACE either to issue the permit, change the evaluation, or refuse the permit. Moreover, notwithstanding the ASA’s decision, the EPA reasserted their right to veto if it is determined to be unreasonable.

Meanwhile, the APP decision was challenged under citizen suit provisions three times by opponents of the mine, twice through the ADEQ’s Water Quality Appeals Board (WQAB), and lastly through the Arizona Superior Court.<sup>141</sup> These appeals were based on a number of arguments, including that the agency had made invalid judgements by failing to independently evaluate data supplied by Rosemont Copper, that the agency had not considered surface water impacts, and evidence that the Rosemont facility would be built differently from that described in the application. The first two

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<sup>138</sup> See Appendix 5

<sup>139</sup> See Appendix 5

<sup>140</sup> See Appendix 18.17

<sup>141</sup> The Arizona WQAB is a committee formed to conduct hearings and render decisions between individuals and public or private entities challenging permit decisions by the ADEQ. The appellants were Mary and Geoff Bird, both of whom were involved with the Save the Scenic Santa Ritas group. Geoff Bird was introduced at the beginning of the thesis as a speaker at the Forest Service’s third open house meeting (the ‘Patagonia Riot’). The board consisted on three members, appointed by [then] Arizona Governor Doug Ducey: an attorney/chair, Laurie Woodall, who had previously worked as a consultant to Rosemont; a geologist/vice chair, Gail Clement; and a public member, Sharon Lagas.

WQAB appeals were respectively submitted by two local residents and Pima County<sup>142</sup>. After both appeals were dismissed by a vote of 2 to 1, a coalition of environmental groups – including SSSR, a Tucson-based NGO *Center for Biological Diversity* (CBD), Sky Island Alliance, the Coalition for Sonoran Desert Protection – and six additional private citizens filed a law suit in the Arizona Superior Court contending that the decision of the WQAB was “arbitrary, capricious, an abuse of discretion, and not supported by substantial evidence.”<sup>143</sup> Again, however, the decision of the WQAB was upheld, with the court maintaining the ADEQ’s argument – among others – that it was under no legal obligation to verify data provided by the mining company.

### 6.2.3. Scope: refugee species

If the riparian habitats at issue in relation to the potential hydrological impacts of the Rosemont Copper mine constitute socioecological ‘refugia’ in a degrading, arid landscape; for many, those non-human species which inhabit those spaces are ‘refugees’, whose fate is no less mediated through impacts to water. Chapter 4 highlighted the public significance of endangered species and the potential threat posed by the hydrological and water quality impacts of the mine upon their habitats. In parallel with the NEPA EIS process, regulatory responsibilities for the provisions of the 1973 *Endangered Species Act* (ESA) fall to the United States Fish and Wildlife Service (FWS). Under Section 7 of the regulations, in consultation with the lead agency for the NEPA EIS process, FWS are responsible for the issuance of ‘Biological Opinion[s]’ relating to the potential impact to endangered species.<sup>144</sup> Thus, the lead agency defers to the responsibility and expertise of FWS to conduct an analysis which, unlike the NEPA EIS process, has no provisions for public input. The FWS’ final biological opinion, issued on 30th October 2013, concluded that with agreed mitigation measures, the project is *not* likely to jeopardize, destroy or adversely modify the habitat of any endangered species.<sup>145</sup> This decision was, however, the product of considerable mediation by FWS management, who overruled and amended preliminary drafts of the Biological Opinion written by lower-level staff

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<sup>142</sup> Following a unanimous vote to do so by its Board of Supervisors, including Ray Carroll

<sup>143</sup> Included among the public appellants were Nan Walden and Dick Walden, proprietors of FICO and the Green Valley Pecan Company and financial supporters of SSSR and other opposition groups.

<sup>144</sup> The ESA requires federal agencies to consult with the FWS to ensure that the actions they authorize are not likely to jeopardize the continued existence of any listed species or modify designated critical habitat of such species. The Forest Service requested the initiation of formal consultation with the USFWS in June 2012 with the submittal of a biological assessment, having determined that the proposed Rosemont Copper project may affect listed species, as well as designated critical habitat<sup>144</sup>. During the consultation, three supplemental biological assessments were completed.

<sup>145</sup> See Appendix 7.2

biologists suggesting that considerable harm may come to one species in particular, the jaguar (see Table 6.1).<sup>146</sup>

Under interview for this research, a key informant with the FWS agreed that the mine could alter the jaguar’s behaviour or even cause him to leave the area, but said it’s not reasonable to conclude it will kill or harm the animal physically. The respondent expressed how that his caused some consternation in the environmental community. “They can have their opinion, that is not my opinion”, it was added. For this employee the jaguar looks “great on funding websites, a ‘sexy species’..‘charismatic megafauna’.” When challenged that the presence of species such as the jaguar in the area is important to local people, the respondent replied:

It means a lot to me too...but the biological opinion of the Jaguar has meant that [we have] had to pull biologists from the field working on the red squirrel. That pisses me off. Every dime spent on the jaguar would have been better spent somewhere else. That is something I will go to my grave knowing.

**Table 6.1 – FWS Draft Biological Opinion – preliminary and amended by Field Supervisor<sup>147</sup>**

Preliminary Draft Biological Opinion	Amended Final Draft Biological Opinion
The mine could kill, harm or harass the jaguar, in part because habitat destruction could impair its breeding, feeding and sheltering by reducing the jaguar’s home range by one-third.	The words “kill” and “harm” removed.
Increased vehicle traffic from the mine is expected to kill or harm the jaguar.	A jaguar road kill near the mine was unlikely because Arizona has so few jaguars and no record exists of one being killed on a highway in the state.
The mine would illegally damage jaguar critical habitat, in part by sharply restricting the animal’s ability to travel between Southern Arizona and Mexico.	Suggests that the jaguar could still reach Mexico by traveling through a different section of critical habitat.
Serious damage to all six primary elements of jaguar critical habitat: prey availability, the presence of rugged terrain, evergreen woodlands and semidesert grasslands, and the animal’s connectivity to Mexico.	Suggests some of those elements would be damaged, but not as severely as the early drafts predicted, and that mitigation and reclamation would ease some of the damages.

<sup>146</sup> The analysis was conducted by the Arizona Ecological Services division of the FWS Southwest Region is based in Phoenix, with local staff offices across the state including Tucson. The decision of the FWS is reflected in the change to the summary of effects on Issue 5E.2 in the Forest Service’s Final EIS, which states that “[i]ndividuals may be impacted, but loss of population viability is not likely” (see Appendix 6.3.4 – page 585).

<sup>147</sup> See Appendix 7

Biologically it makes no sense, but we are at the behest of the Center for Biological Diversity.

An environmental NGO, and employing a team of lawyers whose mission is to litigate under the ESA, the Center for Biological Diversity (CBD) has had a notably adversarial history with the regional office of the FWS and the Field Supervisor specifically. This includes a string of lawsuits, contested by the agency, in which it was ruled that jaguars must be listed as endangered and that ‘critical habitat’ in the Santa Rita Mountains must be officially designated. The FWS’ argument then, similar to in relation to the Rosemont case, was that lone jaguar sightings did not constitute a viable population. “Biology,” stated the FWS key informant in relation to arguments over the biological opinion, “can be different shades of grey”:

[...] I’m being asked to predict the future, but my magic 8-ball isn’t that good, that’s why it’s ‘biological opinion’ [...] There are no slam-dunk answers, we have to make decisions on the best available information”

This key informant pointed to the reluctance of other employees at other government agencies to discuss controversial issues. For this respondent, however, the situation at the FWS different to that of State agencies such as the Arizona Game and Fish Department (AGF) and the ADEQ. While the latter two are responsible to the Arizona Governor, the federal structure of responsibility is more extensive. Thus, while people in similar positions may have concerns about the impact of speaking publicly upon their careers, the FWS employee feels they have “nothing to hide,” continuing,

I’m giving my professional evaluation of what is going on, with a few personal opinions [...] I’ll have no regrets, as long as I do it right. As long as I do what is right on behalf of the American people, even if I don’t like the mine. I’m passionate about the environment and species, but I work within the constraints of the law and policies.

For the local NGO and activist community too, however, personal values and an empathy for nature, non-human species and the threats they face, were significant motivators. As one reflected, “for some people [jaguars are] the holiest, most sacred, and spiritual animal”<sup>148</sup>, while for others:

[I]t actually makes me quite emotional [...] there is some kind of sub-conscious anxiety about the loss of so many species which is brought to the surface by the loss of the jaguar. Their presence is reassuring in some way, and can be important to people’s mental and psychological wellbeing.<sup>149</sup>

Another local activist mirrored this insight:

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<sup>148</sup> See Appendix 18.1

<sup>149</sup> See Appendix 18.21

I'm still a city girl [...] but I love that I know that in the mountain right next to me there's a Jaguar or [...] an Ocelot, or that in the river on the other side of the mountain there is still fresh water that is not originated from the waste of people [...] There's something special about the places that are so pristine [...] that's why I feel like nine threatened and endangered species along one river system in this day and age is just incredible and is something that deserves a lot of energy.<sup>150</sup>

The CBD, according to one key informant for an NGO, were – to use a poker analogy – “‘all-in’ on the jaguar”, and sought to substantiate prospective litigation in the case of a determination by the Fish and Wildlife Service (FWS) that either the jaguar or ocelot would not be jeopardised. To do so, they collaborated with another NGO to undertake a survey using a tracker-dog and remote sensing photography in the area around the mine site thought to be within the range of individual animals. In May 2014, a still image of an ocelot was captured by a remote camera installed by the scientists close to the proposed mine site. As a direct result, FWS retracted their Biological Opinion and reinstated formal consultation with the Forest Service as required by the ESA.

A series of further sightings of ocelots in the region were to culminate in the 2016 capture of remote video footage of a lone male jaguar, stalking along a river in the Santa Rita Mountains. Thought at the time to be the only jaguar in the United States, the release of the footage of the cat received international press coverage.<sup>151</sup> The jaguar was subsequently adopted by CBD as the major focus of its campaign against the Rosemont mine. They sponsored a competition for schools to name the jaguar, and the footage received worldwide media and social media circulation.<sup>152</sup> The NGO organised an event in a Tucson brewery called ‘Night of the Jaguar’ at which the video was screened for hundreds of members of the public and press. Information tables and stalls were organised by various affiliated activists and groups, and speeches were made by the CBD and the researchers who discovered El Jefe.

CBD thus sought to draw upon the legitimacy lent by scientific study and a swell of public sentiment in relation to the ocelot and jaguar as a strategy to contest the Rosemont Copper Project. By

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<sup>150</sup> See Appendix 17.4

<sup>151</sup> This research was undertaken in collaboration with Conservation CATalyst, a group led by wildlife biologists previously linked to the University of Arizona's (UA) Jaguar Survey and Monitoring Project, which was itself funded and overseen by FWS. At the time the footage of El Jefe was recorded, the lead scientist was still operating under a UA research permit & using one of the university's field vehicles. The release of the video through the CBD prompted a negative reaction from UA and USFWS, who claimed that it went against the terms of the research and threatened the animal by potentially revealing its whereabouts to the public. UA removed the scientist in question from its programme. This controversy adds yet another layer to the dynamic between the USFWS and the CBD in relation to the Rosemont Copper Project.

<sup>152</sup> The competition was won by students of the Felizardo Valencia Middle School of Tucson, who chose the name El Jefe (meaning The Boss in Spanish) for the jaguar.

focusing on the plight of on species of ‘charismatic megafauna’, they were able to reverse the determination of a key decision-maker and inhibit the progress of the NEPA EIS process. Yet the ocelot and jaguar themselves emerged as ‘actants’ – following Latour (2004) – in the story, their bodily presence and movements coinciding with the scientific expertise and technologies of antagonistic actors to disrupt the institutional order of things. Nevertheless, a matter of weeks after the video of El Jefe emerged, FWS issued a revised Biological Opinion that again concluded that there would be no jeopardy to listed species in contravention of the ESA. While the reinitiated consultation with the FWS brought forth three new conservation measures from Rosemont Copper to provide additional mitigation of impacts to threatened and endangered species, the Forest Service were free to concentrate on the other aspects of the NEPA EIS process.

In contrast to the tensions surrounding the hydrological modelling, there were no dissenting voices within the NEPA federal advisory committee in relation to the jaguar specifically.<sup>154</sup> Despite the Biological Opinion, the key informant for the FWS hadn’t “seen the hydrological results” but was “very worried” about the hydrological impacts to Cienega Creek and the threat of “wiping out” certain aquatic and riparian species. Indeed, the key leaders of the oppositional effort against the mine, from Save the Scenic Santa Ritas, accepted that the presence of one jaguar and one ocelot did not constitute breeding populations. Rather, they mirrored the FWS employees own concerns for endangered aquatic species in emphasising the fish in Cienega Creek which will be impacted by changes to water quality and quantity.<sup>155</sup> Thus, despite often working in collaboration, the positions maintained by various opposition groups vary in relation to each other. While CBD centred their campaign on the jaguar, the lens of SSSR has focussed most clearly on water. These efforts are manifest in the both the content and diversity of comments submitted on the Draft EIS, as displayed by the thematic analysis in Chapter 4. The Forest Service’s content analysis identified as many comments on impacts to birds as on the jaguar, and far more respondents focussed on the water-related impacts to riparian and aquatic habitats.

### 6.3. Ethics

As well as being a reaction to the format and technocratic framing of the participatory arrangements for the NEPA EIS process (i.e. knowledge controversies), the ‘Patagonia Riot’ can be seen as a rupture culminated from of a series of ethical controversies in the weeks and months leading up to the third public scoping meeting. Over this period, and continuing over subsequent months, tensions

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<sup>154</sup> See interview notes: Appendix 18.2

<sup>155</sup> See interview notes: Appendix 18.5

between the public, the Forest Service and the Rosemont Copper Company accumulated. Complaints directed toward the Forest Service included dissatisfaction over the notification period for the process, and the communication and suitability of the venues and scheduling of the public meetings. The most significant moments, however, centred on the conduct of the Rosemont Copper Company and the Forest Service. As described in the following sub-sections, as the conduct of the mining firm transgressed what many saw as moral thresholds, the objectivity of the lead agency for the decision-making process was challenged in the courts. Rather than pertaining to the socioecological domains, however, these ethical controversies relate to the efforts on the part of the proponents to assert the dominance of the economic arguments in favour of the mine. In so doing they marginalise the socioeconomic contentions against the project.

#### 6.3.1. Conduct

For its publicity campaign, Rosemont Copper had procured the services of two public relations companies.<sup>156</sup> As described in Chapter 4, multiple approaches – including television and radio advertisements, social media, direct canvassing, sponsorship, letter drops, site tours and organised events – were undertaken to promote the benefits (and discursively regulate the disbenefits) of the proposed copper mine.<sup>157</sup> However, accusations of impropriety in relation to this effort were aimed at Augusta following the first ‘open house’ meeting in Tucson on 18<sup>th</sup> March 2008. It was alleged that they had canvassed a number of residents in one of the poorer neighbourhoods of the city, inviting them to the meeting under the false pretence of being able to apply for jobs. The residents were offered transport to a restaurant en route, where a free meal was provided and signatures of support requested. Afterwards, the buses continued on to the meeting with its passengers having been handed pro-Rosemont paraphernalia to wear. Questions were raised when it became apparent that there were no jobs to apply for at the meeting, leading to claims that people had been led there dishonestly.<sup>158</sup> Faced with a damaging media fall-out, the following day Rosemont Copper issued a press release apologising for the “confusion” and specifically distancing the Forest Service from any involvement in sanctioning or organising the ‘bussing in’ of members of the public.<sup>159</sup>

Nevertheless, this practice was to be repeated by Augusta on numerous other occasions, albeit in a less flagrantly exploitative manner. Rather than job-seeking citizens, mining industry workers, in

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<sup>156</sup> Strongpoint Marketing and Zimmerman Public Affairs

<sup>157</sup> See: <https://youtu.be/WAjLGxU5MkY>

<sup>158</sup> See Appendix 9.2 and 9.3

<sup>159</sup> See Appendix 13.2 - Augusta apology; and Appendix 11.2.1 – Giffords Press Conference

branded hi-visibility workwear, were debarked at the public meetings during the later public review of the Draft EIS<sup>160</sup> (see Plate 6.1). Prominent were employees of the mining haulier CTI Incorporated<sup>161</sup>, some of whom took to the stage to argue for the employment benefits the mine would bring. A “pre-public hearing event” in this latter instance was sponsored by the Southern Arizona Business Coalition (SABC), whose president is also president of a major Tucson-based manufacturer of mining technology and services.<sup>162,163</sup> In advance of the event, moreover, the SABC published in a list of talking points in support of the mine subtitled “What Should I Say” on its website<sup>166</sup>.



**Plate 6.8 - FS Public Hearings following publication of the Draft EIS for the proposed Rosemont Copper Project. Project supporters arrive in a bus (1) for meeting in Elgin on 12<sup>th</sup> December 2011, carrying ‘YES to jobs’ thumbs up signs distributed at lunch pre-meeting event organised by SABC (2). At the hearing, a CTI employee makes statement in support of the mine (3). At a later event, members of the public wave signs in protest as Ron Barber, district director for Congresswoman Gabrielle Giffords<sup>167</sup> over-runs the 3-minute time limit for statements<sup>5</sup> (Images reproduced with permission of Frances Causey and Save the Scenic Santa Ritas).**

<sup>160</sup> See <https://youtu.be/87hR0fpRjow> and <https://youtu.be/14hRQAz35C8> [accessed 24th March 2016].

<sup>161</sup> See <http://www.cti-az.com/cti-home> [accessed 24th March 2016].

<sup>162</sup> See [http://working4arizona.org/?page\\_id=389](http://working4arizona.org/?page_id=389) [accessed 24th March 2016].

<sup>163</sup> Strategic coordination of such activities between the mining company and other business interests in the proposed project – articulated through organisations such as SABC, Tucson Metro Chamber, and Green Valley-Sahuarita Chamber of Commerce – can be seen to have been highly effective in mobilising public support on the grounds of local economic development and employment. This is manifest in the volume of public comments submitted in respect to this argument.

<sup>166</sup> See Appendix 14.1 and <http://working4arizona.org/?p=64> [accessed 24th March 2016].

<sup>167</sup> Congresswoman Giffords, an active opponent of the Rosemont project, was injured in an assassination attempt in Tucson in January 2011.



Numerous other accusations of highly questionable conduct followed, including one instance in which Rosemont Copper's outreach efforts allegedly included the falsification of residents' signatures on blanket letter drops to neighbourhoods of Tucson (Vanderpool 2011, Vanderpool 2012). Furthermore, in June 2008, the Rosemont Vice President was again forced to apologise (actually pleading "*mea culpa*") when confronted by local residents questioning the company's apparently deliberate acquisition of several internet URL addresses, including "stoprosemontmine", "norosemontmine", and "savethescenicantaritas." In a video recording of the meeting, Mary Rowley of Strongpoint Marketing can be heard reasoning that the buying up of URLs on behalf of clients in this way is "common practice"<sup>169</sup>.

### 6.3.2. Bias

Thus, from early in the NEPA EIS process, the Forest Service was subject to considerable scrutiny over the conduct of the mining company within its decision-making process. This scrutiny extended to the relationship between the two parties, and the transparency and objectivity of the process of recruiting and analysing scientific information which formed the basis for its analysis of the impacts of the mine. In June 2011, it was alleged that between April 2009 and November 2010 the agency had conducted 19 cooperating agency meetings with the mining company and its representatives without facilitating wider public participation or "fairly balanced" representation, as required by the 1972 *Federal Advisory Committee Act* (FACA). According to the minutes of these meetings, Rosemont appeared to provide guidance, advice, or recommendations to Forest Service officials regarding evaluation of environmental impacts, potential mitigation measures, and consideration of alternatives in preparation of the Draft EIS. This controversy emerged publicly, when an injunction motion was filed jointly by a coalition of three oppositional parties: SSSR, CBD, and Farmers Investment Company (FICO), who contended that the case "represents an egregious example of [the Forest Service] manipulating the FACA process to allow a private party inappropriate access and involvement in the NEPA cooperating agencies review process — with immediate and irreparable harm to Plaintiffs and the public."<sup>170</sup>

The plaintiffs further argued that Rosemont's participation resulted in a chilling effect on the other members of the committee and had the effect of negating or overriding the input from Pima County and the other cooperating agencies, further and irreparably tainting the Draft EIS. The injunction claim thus sought an order that Rosemont no longer be permitted to attend the cooperating agency

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<sup>169</sup> See <https://youtu.be/-dWB2crujjo> [accessed 24th March 2016].

<sup>170</sup> FICO's *Green Valley Pecan Company* farms pecans in the area, using water from the Upper Santa Cruz Aquifer.

meetings; and to prevent the USFS from issuing the Draft EIS until the public had been allowed to comment upon the preliminary draft of the Draft EIS. However, relying heavily on the declaration of the Senior Vice President for Augusta Resource Corporation, the parent company of Rosemont Copper, the defendants argued that the primary purpose of the meetings in question was “to exchange information and to educate the cooperating agencies, many of which had little knowledge about Rosemont project [...] or the NEPA EIS process” and were documented as “information sharing” meetings. They claimed that the NEPA EIS process “is intended to provide a springboard for public comment,” and that “Plaintiffs and other members of the public will have ample opportunity to provide input to the Forest Service” prior to the final decision.

The Court agreed with the defendant’s contention that the plaintiffs had failed to show the likelihood of “irreparable harm”, based on the fact all public citizens would have the opportunity to review and be heard during the NEPA EIS process prior to the publication of the Final EIS. Furthermore, the ruling stated, the Plaintiffs had failed to clearly show that Rosemont and its associates or representatives through their participation were *de facto* members of the cooperating agencies meeting group, or how they had affected the process. While the injunction was denied, the Judge nevertheless stated that “the Court does find, at best, that the USFS was less than prudent in inviting Rosemont and its consultants as the primary and only regularly invited non-governmental agency and that such actions, at a minimum, presents an appearance of impropriety on the part of the USFS as well as Rosemont.”<sup>171</sup>

Despite the judgement, this “appearance of impropriety” served to further reinforce the collective identity among individuals and groups opposed to the mine, based upon a narrative of injustice at the suppression of participation and overt conflicts of interest. As a result, by the time that the Draft EIS was published in October 2011, public awareness and interest in the project had swelled. More than 25,000 comment submissions were received during the subsequent public commenting process (analysed in Chapters 5 & 6), and the analysis of these comments and their incorporation into the Final EIS took a further six months. This fed into further conflict over the scientific and legal basis for the decision-making process as it continued through the Draft and Final EIS stages.

These apparent improprieties on the part of the mining company were, in the view of many members of the public, patently unethical. And yet none of the conduct which generated the controversy around the RCP contravened any state or federal law. That there was no protection of the public democratic interest in these respects, speaks to the perception among many of the

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<sup>171</sup> See Appendix 8.10

asymmetric levels of power and influence in the relationships between the state and the proponent on one hand, and the state and the public on the other. This view is represented strongly in the public comments on the Draft EIS, in which respondents frequently question the objectivity of the Forest Service and the scientific assessment it was undertaking. Prominent among these arguments is the potential for a conflict of interests inherent in a situation where the lead government agency is reliant upon scientific studies undertaken by consultants in the employ of the mining company itself. One of the major points of conflict over the RCP thus relates to the relationship between officially certified 'knowledge producers' and corporate interests in the project. This tension stems from the absence of regulation to prohibit the lead agency from basing its analysis in the EIS on data produced by the proponent or scientific consultants in the employ of the proponent. Indeed, it could be argued that with adequate resources and expertise, the Forest Service – as the lead agency – would not be left with little choice other than to recourse to this approach in order to carry out the EIS process within a reasonable time frame. While there are undoubtedly pragmatic limits upon the ability science to predict impacts with absolute certainty, the potential for a conflict of interests in this arrangement leads to questions over the integrity of the methods and data.

#### 6.4. Power and relative autonomy

As described in Section 6.1, mining has been framed as deeply embedded in the establishment of the State of Arizona and the collective identities of many Arizonans as an object of industrial heritage. Despite the boom-bust history of the industry, the industry has made a significant contribution to the economic growth and development of southern Arizona. The continued successful development of Arizona's mineral resources is thus a key issue for voters in the state. The arrival of multi-national mining corporations in the region has also been accompanied by considerable financial power to invest in political lobbying and campaign finance. The Arizona State Governor has been a vocal advocate of the mining industry in the state, including through the Southern Arizona Business Coalition who organised for the 'free lunch' controversy described in Section 6.3.1. He has also been reported to have lobbied for the devolution of environmental regulation from the federal to the state-level,<sup>173</sup> and to have lent his support to a Koch Brothers-funded organization opposing the designation of the area around the Grand Canyon as a national monument that would include a permanent ban on uranium mining.<sup>174</sup>

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<sup>173</sup> See [http://tucson.com/news/local/gov-doug-ducey-asks-epa-for-power-to-regulate-arizona/article\\_fb9fe0ee-0da1-561e-af4b-b209ee0857ec.html](http://tucson.com/news/local/gov-doug-ducey-asks-epa-for-power-to-regulate-arizona/article_fb9fe0ee-0da1-561e-af4b-b209ee0857ec.html) [accessed 28th March 2017].

<sup>174</sup> [http://www.azchamber.com/blog/wp-content/uploads/2016/01/policybrief\\_az-3.pdf](http://www.azchamber.com/blog/wp-content/uploads/2016/01/policybrief_az-3.pdf) [accessed 28th March 2017].

In the opinion of one federal agency interviewee, the issuance of the Aquifer Protection Permit (APP) by the ADEQ (as described in Section 6.2.2), which falls under the administration of the Governor, was “150% a political decision” driven by the overt support of the Arizona Governor for mining. For one high-ranking ADEQ informant interviewed for this research, however, a separation between values and legal and economic rationales is significant:

[T]here are people who are opposed to the mine philosophically, but those opinions and feelings are not grounded in law. The ADEQs job is not to make decisions based upon how we feel about the mine, or our philosophical beliefs [...]. The ADEQ is authorised to take action based upon state and federal law, and are bound by the restrictions put in place by those laws. [...]. It frustrates people [because they believe] that the name of the agency means that its only responsibility is to protect environmental quality. [...T]hat certainly is [our] stated mission and the basis for the laws and rules that I have to live by and apply, but I still have to live by and apply those rules, I don't get to make a philosophical decision that mines in general are not a good idea for the state of Arizona [...]. I would not have a job if I was philosophically opposed to mining. Our job is to make sure that when mining occurs it is done in the most protective way possible.

This respondent then contrasted the “philosophical opposition” with their personal outlook:

In order to have a strong economy you have to have a thriving environment, and in order to have a thriving environment you have to have a strong economy. One of the reasons that third-world countries do not have thriving environments in which to live is that their economies are depressed. And in such situations other things take priority. A strong economy means you have the discretionary income to invest in environmental issues. One of the cornerstones of Arizona's economy is mining, and if we were to stop mining, then we may cause the economy to decline and therefore will not have the discretionary income to protect the environment. [...]. This is a philosophy that I bring to my [work], it's not 'one versus the other', my goal is to find ways of having both, there are sacrifices to be made, but so long as things are being done in a way that is in compliance with state and federal requirements, I think it's the right thing to do.

The latter respondent said that denial of the Rosemont application would be supported should it not comply with statutes and rules. However, they stated that “[a]t the point at which [Rosemont] were applying for the APP, they had to show their shareholders that they were making progress in the permitting arena [...] they needed a win, so the win they got was to get this permit from us.” In this interview, the respondent highlighted the argument put forward by opposition groups that the APP should not have been issued before the NEPA EIS process is completed. For the ADEQ, however, there is nothing in state law requiring them to wait. The NEPA EIS process and state process are “on

parallel, but not intersecting, tracts, and the APP is a 'state', not 'federal' law." Thus, it was argued, "legally, the ADEQ had no choice but to issue the permit."

Moreover, as the respondent emphasised, there is a legal requirement for the agency to process the permit within 'licencing timeframes'. The penalty for not issuing the permit within that time is that it must be issued free of charge to the applicant. The respondent thus revealed his consciousness of the economic pressures at play in the decision-making process, stressing that:

ADEQ is not funded from taxes. 85% of ADEQs funds come from fees for permits, the rest comes from EPA in the form of federal grants. The permit for Rosemont mine could cost in the region of 0.5-1 million dollars in terms of services provided. If the licencing timeframe is missed, that loss could mean laying off about ten employees. We're really in a tough spot. We even asked Rosemont 'could you please withdraw your application until the NEPA EIS process is done so we will know what we are permitting', but they capitalised on what the state law says [in that they are legally required to review it].

At the time of the application for the permit, the Director of the ADEQ was something of a reformist influence on the department. In line with the Governor's cost-cutting drive, the Director had implemented measures for greater efficiency in permitting, promoting a vision of "radical simplicity for customers and staff" and "balanced, leading-edge environmental protection."<sup>175</sup> The strategic plan was strongly influenced by the Toyota Production System which pioneered 'Lean Manufacturing', translated into a 'Lean Management System'. This approach resulted in a significant reduction in processing times for permits such as the APP. It was accompanied by a reframing of regulated entities as 'customers' and efforts to improve the transparency of the process through live web-portals. Simultaneously, considerable effort was put into reforming the culture of the organisation, to the extent that their approach includes: "[to] hire only those who believe in our way [...]; train those who cannot, replace those who will not, and promote those who excel."<sup>176</sup>

The agency's removal from a general funding [taxation] model and its reliance upon permitting fees for 85% of its revenue, combined with legal timeframes and financial penalties for permitting, creates a necessity to meet 'customer' requirements as quickly and efficiently as possible. As the key informant from the ADEQ acknowledged, however, this efficiency/manufacturing ethos is in tension with the agency's publicly perceived (and actual) role in protecting environmental quality.<sup>177</sup> Indeed, with 'quality' being a subjective and ambivalent term, the difference between the respective names

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<sup>175</sup> See Appendix 2.1

<sup>176</sup> See <https://azdeq.gov/careers> [accessed 1st April 2019].

<sup>177</sup> See Appendix 17.7

of the ADEQ and the Environmental *Protection Agency* could be said to exemplify the ideological tension that has emerged between the two agencies.

For its part, the ADEQ has refuted the EPA's criticisms, and the key informant interviewed here suggested that the EPA's opposition to the Rosemont proposal goes beyond scientific reason. In the latter's opinion, the EPA has "a philosophical opposition to open pit mining, period. [...]. I do not believe that is appropriate in the state of Arizona." In the view of this respondent, the EPA's comments and positions are "not supported by a thorough scientific analysis under the laws that exist at the federal and state level."<sup>178</sup>

Nevertheless, the apparently favourable political environment for mining was corroborated by a key informant from the Arizona Geological Survey (AGS). This respondent pointed to a positive perception among the mining industry of the Arizona Governor's appointed ADEQ Director. Under this tenure, the ADEQ is viewed as having adopted a "more transparent and open permitting process [which] enables applicants to see the status and sets clear time-frames with fewer surprises in terms of going back or stopping the process to address something, unless something comes up that really justifies it [...] reducing uncertainty."<sup>179</sup> In contrast to the ADEQ, who as an 'environmental' agency are forced to defend their objectivity and methods of analysis, the AGS' stated mission is to promote the 'wise use' of mineral resources in the state. With the State Geologist also reporting directly to the State Governor, the AGS is deeply embedded in the establishment of the region's mining economy, having emerged out of a succession of institutions within the University of Arizona – a land grant university established specifically for the development of expertise and labour for the local industry.

The AGS is also directly responsible to the Governor for "provid[ing] technical advice and assistance in geology to industry toward the wise development and use of the mineral and land resources", including through the NEPA EIS process.<sup>180</sup> The AGS is eligible to contribute to the NEPA EIS process as a cooperating agency, retaining considerable expertise in the fields of economic geology and hydrogeology. The survey is significant in both a discursive and scientific capacity in relation to the mining industry and federal decision-making. The organisation's absorption of the Arizona Department of Mines and Mineral Resources created a tension with employees retained from the latter, whose role was more overtly as an industry advocate. Consequently, the AGS invests considerable energy in industry advocacy through the media, and organising and sponsoring industry

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<sup>178</sup> See Appendix 17.7

<sup>179</sup> See Appendix 17.16

<sup>180</sup> See <https://azgs.arizona.edu/about> [accessed 1st April 2019].

and public events. It therefore forms a significant part of the ideological state apparatus in the dissemination of discourses which were translated directly into the NEPA public comments from proponents of the Rosemont mine.

By contrast, while the Arizona Game and Fish Department also has no permitting jurisdiction, the nature of their involvement (through their regional 'Field Operations' staff) in the NEPA EIS process is to ensure that adverse impacts to its regional interests (i.e. the habitats upon which game and fish resources depend) are prevented or mitigated. The AGF has a five-member commission which is responsible for hiring the director and answers to the State Governor, but takes positions on proposed land use plans related to wildlife impacts. As one AGF employee reflected, "[t]he commission means that [department staff] have a certain degree of protection in terms of what they can or cannot say and do. However the ADEQ director reports directly to the Governor, therefore they are more exposed."<sup>181</sup>

Thus, while the ADEQ issued the APP for the Rosemont mine, employees for the AGF – with a greater degree of separation from the State Governor – separately contested the basis for the assessment of water quality impacts to ecological resources in the EIS. The agency hired a hydrologist and an attorney to work on their comments, and worked with an Arizona Assistant Attorney General regarding possibility of legal action against Forest Service in respect to the impacts of the mine upon their interests.<sup>182</sup> Nevertheless, for AGF employees a tension between professional and scientific integrity on one hand and institutional power on the other hand is significant. This is manifested in a reluctance to make public assertions which may be at odds with the State Governor's position. Thus, while in a closed setting – such as cooperating agency meetings with the Forest Service – staff may adopt scientific positions based on their scientific expertise which could be interpreted as being obstructionist, the projection of such a position into the public sphere (including through being an informant for this research) could have personal ramifications in terms of their careers.<sup>183</sup> Consequently, while AGF staff are able to negotiate concessions such as technological mitigations or habitat 'off-setting'<sup>184</sup> for impacts arising from the development, the possibilities for outright rejection or legal challenge of the proposal on any grounds appear severely limited.

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<sup>181</sup> See interview notes: Appendix 17.2

<sup>182</sup> See interview notes: Appendix 17.2 and 17.12

<sup>183</sup> See interview notes: Appendix 17.23

<sup>184</sup> The practice of artificially constructing habitat in an adjacent or alternative location in mitigation for adverse impacts to habitat resulting from a development.

## 6.5. Conclusion

Many of the themes relating to the benefits and disbenefits of the proposed Rosemont mine found in the public comments – and particularly relating to the balance between economic benefits and ecological impacts – reflect well-resourced and extensive strategies of public engagement and public relations efforts on the part of businesses, including the mining company itself, industry advocacy and public opposition groups, NGOs and various coalitions of interests. Opposing strategies of support and opposition to the mine utilised local and regional press, websites, social media, advertisements, posters and flyers, as well as organised events which often coincided with the various stages of public involvement and NEPA meetings (with often controversial results, as discussed in Section 6.3). Through these media, opponents and proponents strategically deploy competing discursive frames and narratives of economic, ecological and cultural concerns, with a view to engaging and generating public support for and against the proposed mine among communities at the local and regional scale.

These discourses were thus framed and combined to produce narratives, or sequences of events, actions and happenings. In this way, discursive elements have been selected and configured in ways that attached significance and meaning to them as a coherent, relational whole. Thus narrative plots were formed, which were translated into what Davis (2002) called “a cultural script for action.” As this chapter describes, while discourses emanate from wider societal consensus, they are not free-floating. Rather, they are reproduced by, and actively reconstitute, “discursive coalitions” or networks of relations between individuals and organisations with overlapping objectives and interests (see Beck 1996).

This chapter describes examples from two main ‘battlegrounds’ or objects of contestation and controversy, those of ‘science’, and ‘ethics’, and the significance of power in the conflicts over the Rosemont mine. Section 6.2 highlighted that scientific arguments pertain to approaches to public involvement, scientific rigour and the scope of the analyses conducted for the EIS process. The unidirectional, ‘open house’ format of the public meetings and the ‘substantive’ standards for public comments were informed by tokenistic institutional discourses of public engagement set out in the CEQ regulations. At the root of this situation is the regulatory definition of the ‘no action alternative’ as the baseline against which the impacts of the project should be assessed, rather than a genuine possible outcome. This precludes the agency leading the EIS process from recognising any rationalism other than that of the state. The act of public insurrection at the Patagonia High School was informed through a network of experienced activists who exploited past examples of vulnerability in the legitimacy of ‘open house’ meetings. Through enlisting the support of political



figures they were thus able to change the format of the public meetings. However, with the 'purpose and need' for the action protected by the substantive standard, the public hearings were an exercise in therapy.

Meanwhile, in the absence of regulatory disincentives, the EIS was being conducted on the basis of 'best available science' from consultants paid for by Rosemont Copper; and the mining company were able to manipulate and coerce the public into supporting the mine in the NEPA EIS process. In the institutional sphere, however, locally embedded and relatively autonomous institutional actors moved to contest the rigour the analyses conducted. Thus, tensions between the EPA, the Forest Service, the ADEQ and the BLM; between various actors at various levels within those organisations; and between those embedded at various scales from the local community to the federal administration have been significant in the temporal and objective trajectory of the RCP. Indeed, despite the apparent preclusion of 'agonistic' views from the public commenting process described in chapters 4 and 5, these acts of resistance and disruption challenge framings of the NEPA EIS as a cooperative, overwhelmingly consensual process.

Simultaneously, the activist community muster considerable resources to contest the scientific and legal basis for the environmental permitting that runs parallel to the NEPA EIS process. Within these spaces discourse is allied to antagonistic energies in strategies of knowledge production, dissemination, alliance, manipulation, exploitation, litigation, resistance, disruption, dissent, disobedience, and subversion. Political support was generated by drawing attention to scientific and ethical controversies. Public support was generated through the assertion of alternative rationalities, of values for intrinsic nature and cultural values. The internet, social media, and the liberal press provide the possibility to compete with the discursive attempts to contain the socioecological and socioeconomic contradictions of mining. Messages are conveyed by other means, through art and community projects. It is through these processes of re-politicisation that attempts to depoliticise Rosemont debate were contested.

# **7.**

## **Excavating the post-political: discussion and conclusions**

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This concluding chapter returns to the four research questions, introduced in Chapter 1, which guided the empirical research described in Chapters 4 to 6, and summarises the key themes developed through the thesis. The overarching aim of the work was to offer a perspective on the democratic capacity of environmental impact assessment and public participation through the example of the United States' National Environmental Policy Act (NEPA), and the particular case of the proposed Rosemont Copper Project in Arizona. This thesis is thus premised upon a critical engagement with critiques of neoliberal environmental governance and deliberative democratic theory, as discussed at length in Chapter 2. Implicit in the arguments of this thesis is that participatory environmental policy and governance (in the form of the NEPA Environmental Impact Statement process) has a structural bias toward the interests of corporate power and mining capital. More specifically, however, it engages with debates over the 'post-political' nature of democratic governance, which argues that such political-economic axes of power are maintained through the de-politicisation of space.

This research has thus sought to empirically substantiate the way in which the practices of democratic participation in NEPA are effectively de-politicised through the deployment discursive framings made up of scientific and ethical rationalities that are underpinned by relations of political-economic power (see Foucault 1975). In line with post-structuralist perspectives that post-political and post-democratic theories have adopted, however, the analysis was extended beyond this ordered space of government, to the broader territories in which disordered, heterogeneous networks and spaces of association in which subjectivities (knowledge and rationality) are simultaneously shaped, contested and 're-politicised'. Nevertheless, this thesis contends, these dynamics of power and resistance are not necessarily confined to actors operating either inside or outside of institutional spaces. On the contrary, the effects of power vary along with spatial and social scale and between institutional contexts with varying degrees of relative autonomy.

The first objective of this research was to develop a means of analysing the efficacy of the NEPA EIS (Environmental Impact Statement) process in incorporating public views and to understand the structural and external influences upon the process. The specific methodology developed to achieve this was described in Chapter 3, which also outlined the context and rationale for the selection of the Rosemont case study. This task first required gaining an understanding of the geographic nature of the groups engaged in the matter at hand; and the nature of their respective views, opinions and values as articulated through the NEPA public involvement. This was the objective of *Research Question 1* (RQ1, recapped below) – and the focus of Chapter 4. The insights from this Thematic-Spatial Analysis are synthesised in Section 7.1 below. Secondly, the democratic agency of those

### Box 7.1 – Research questions

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|-----|--|
| RQ1 | <i>What is the thematic and geographical nature of competing arguments in the NEPA EIS public commenting process for the proposed Rosemont Copper Project?</i> |
| RQ2 | <i>What are the limitations to the agency of this public engagement and those participating in the NEPA EIS process?</i>                                       |
| RQ3 | <i>What role do spatial relations of social, political and economic power play in the NEPA EIS process?</i>  |
| RQ4 | <i>How can the Rosemont case be considered within the wider context of theoretical debates around the democratisation of environmental decision-making?</i>    |

public participants – and, therefore, the democratic capacity of the NEPA EIS process – was assessed through a ‘theme-response’ analysis of the predominant agency responses to public comments in relation to the themes identified. The latter was the objective for *Research Question 2* (RQ2) for which Chapter 5 presented the findings of this research, which are summarised in Section 7.2.

*Research Question 3* (RQ3), meanwhile, was concerned with going beyond the domain of policy and process to consider the role of power and resistance in the trajectory of the Rosemont public consultation process. The resultant insights from Chapters 5 and 6 in relation to this latter aspect are reviewed in Section 7.3. The fourth and final research question (RQ4) requires considering the empirical insights from Chapters 4 to 6 in relation to the *meso*-level policy debates and *macro*-level theoretical debates introduced in Chapter 2. The latter aspect is the focus of Section 7.4. Section 7.5 comprises an overall discussion of the contribution this thesis makes to the existing literatures outlined in Chapter 2. Section 7.6 sets out recommendations in the context of the case study for policy and practice, as well as options for further research.

#### 7.1. Competing themes

The Forest Service’s database of public comments and agency responses to the Draft EIS offered an extensive and rich dataset from which to begin to understand the democratic capacity and de-politicisation of the NEPA EIS process. Having adopted the position that achieving this objective required an analysis of the extent to which the public are able to influence the impact assessment process, then it was first necessary to understand the thematic and geographical nature of public concerns in respect to the proposed Rosemont Copper Project (RQ1). This implied first asking, what were the principal objects of these concerns, in terms of the potential risks and benefits of

consequent material, ecological, social and economic change? Secondly, seeing as – at perhaps the most fundamental level – the democratic right of citizens to participate correlates to the likelihood of direct impact and their physical proximity to the object of concern, how do these assertions relate to geographic scale in respect to the proposed mine site? In other words, from whom and where do the various claims in relation to various matters of concern originate?

Chapter 2 introduced the historical and geographical context of the region within which this empirical case study is situated. This context, and the more specific background to the Rosemont Copper proposal described in Chapter 3, was significant in framing the thematic domains in the analysis of the public comments which followed in Chapter 4. Thus the key geographical, ecological, cultural and economic aspects of the local area implicated by the proposal were pinpointed. In Chapter 4, the key actors, including land-owners, federal, state and local government agencies and staff, and public groups were identified. An initial analysis of the public comments characterised the respondents in terms of their general position (opponent, proponent, or neither) on the Rosemont mine and their residential location in respect to the proposed mine site. From the submissions made by the sample of 397 respondents, it found the Rosemont mine to be a highly contested matter, with only a marginally higher proportion of the submissions explicitly stating opposition to the mine. It found support for the mine to be most prominent in the major metropolitan area of Tucson. However, residents of the city also represented the majority of those who stated their opposition to the project. Nevertheless, it is also significant that of those respondents opposed to the Rosemont proposal, considerably more were found to be distributed further toward the local scale in comparison to supporters of the mine.

Chapter 4 described the results of the Thematic-Spatial Analysis of the written comments of 397 respondents in respect to the Forest Service's Draft Environmental Impact Statement for the Rosemont Copper project. This analysis identified three primary prevalent thematic domains. The first two related to the 'socioeconomic' and 'socioecological' impacts of the proposed mine, and corresponded to a range of themes and sub-themes which can be seen as objects of concern, such as 'employment' or 'riparian habitats'. Meanwhile, the third thematic domain, of 'water' identifies comments which related to the mediating function of water as something which is essential to the integrity and functioning of many of the other socioecological and socioeconomic elements. Indeed, as Figure 4.2 shows, flows and qualities of water are a central, enabling and linking elements in the nexus of existing and potential socioecological and socioeconomic relationships active and implicated by the proposed Rosemont mine.

In a pattern similar to that of the geographic distribution of support and opposition for the proposed mine, the Thematic-Spatial Analysis revealed the predominantly metropolitan nature of assertions of the positive socioeconomic impacts of the project. This is obviously not surprising, seeing as – notwithstanding ‘outlying’ views of open-cast mines as objects of ecological beauty – the only ‘benefits’ of a copper mine are the socioeconomic. Consequently, much of the discourse on the positive socioeconomic effects of the mine are framed in pragmatic terms of the benefits as *balanced against* the ecological disbenefits. Predominant, in this respect, are arguments for the various operational approaches (i.e. sustainable mining), technologies, and regulatory compliance mechanisms which will enable and require the mining company to ‘minimise’ or ‘mitigate’ the adverse socioecological impacts. Meanwhile, the increased employment and revenues are themselves variously claimed for their potential to mitigate the impacts of the 2008 economic crisis. They are also related to forms of regional and national chauvinism, in which a narrative of mining as part of a shared Arizonan and American industrial heritage is set against complaints of increased reliance upon resources and goods from overseas.

By contrast, concerns for the risk of negative socioeconomic and socioecological impacts resulting from the Rosemont mine are characterised by their more local nature. In many respect, the socioeconomic concerns raised by these respondents can be seen as a mirror negative of those claimed by proponents for the mine. Thus they emphasise the risk of adverse impacts to existing businesses and the resultant decreased revenues and job losses. In particular, these impacts are related strongly to the hydro-ecological impacts of the mine, undermining the value of the area for tourism. Moreover, rather than a solution to economic crises, opponents view the Rosemont Copper Project as a threat due to the inherent volatility of global markets in which local resources will be sold as commodities to profit a foreign corporation, until such time as the claim is no longer economically viable but the environment is irretrievably damaged.

For these opponents, therefore, the risk of long-term adverse socioeconomic and socioecological effects outweighs what they see as the probable inadequate short-term economic benefits of the project. Indeed, they view the mine as a threat to their own socioeconomic and socioecological welfare and that of future generations in the area. They also highlight the potential for personal economic losses, particularly in relation to the value of rural real estate which may be negatively impacted by the impacts to the landscape, and the threat to water resources. Meanwhile, the potential implications for cultural values for the local environment, including those of a recreational, aesthetic and spiritual nature, are significant for local residents. However, as well as these more instrumental concerns, comments pertaining to the socioecological domain were predominantly

related to threatened ecological habitats and species. The significance of water in this landscape of scarcity, ecological refugia and refugee species is emphasised by the prevalence of concern for the adequacy of the geohydrological modelling employed in the Draft EIS analyses.

Indeed, a large proportion of the respondent's comments asserted not only concern for impacts to specific socioeconomic or socioecological values but also for the rigor and scope of the scientific analyses conducted to assess those impacts. Contestation in relation to the scientific basis for the decision-making process and the extent to which such analyses are open to challenge by non-certified forms of knowledge, particularly in respect to water impacts, are central to understandings of the democratic capacity of the NEPA EIS process as summarised in the following section. As described in Section 7.3, moreover, such scientific tensions, alongside legal and ethical concerns, are key aspects of the socio-political thematic domain through which the proposed Rosemont Copper Project is contested.

## 7.2. From legitimation to disavowal: limits to agency

Having characterised the thematic and geographical nature of public engagement in the commenting process for the Rosemont Draft EIS, Chapter 5 went on to analyse the Forest Service's response to the thematic domains identified. This analysis was aimed at understanding the substantive level of public influence upon the EIS process. Through this approach it was possible to draw some conclusions about the role of the public and the limits to their agency in the NEPA decision-making process (RQ2). The primary objects of this analysis were the Forest Service's Public Concern Statements, which – as mandated by NEPA – included summary written responses to issues categorised by their own 'content analysis' process (as distinct from the 'thematic analysis' conducted for this thesis). Meanwhile, changes to the Final EIS document itself, alongside which the responses were published, were also examined to triangulate and explain more fully the institutional response to public engagement.

The analysis found that, through rejection of arguments on legal and scientific grounds and the reinforcement of scientific rationales through conducting additional analysis, the responses to the public comments can be said to have largely been one of disavowal. Public concerns relating to the negative socioeconomic and (most prevalently) socioecological impacts were most commonly responded to in terms of legal disavowal, in which the substantive nature of the comments was circumvented entirely. Scientific disavowal, the most prevalent response (present in over half of responses), was primarily used to respond to issues relating to water and socioecological impacts, in which the existing scientific methods and findings of impact were defended in the face of criticisms

over rigour. The conducting of additional analysis was an almost equally common response, used primarily in addressing concerns of a socioeconomic or socioecological nature, and characterised ultimately by the reinforcement of the findings in the Draft EIS. Notably however, the most substantive response to public comments, which entailed the incorporation of additional mitigation measures into the plan of operations, only occurred in 10% of the responses analysed.

In simple terms, it can be said that the scope for influence on the NEPA EIS process is notable in this example for its delimitation to the less influential end of the normative democratic scales of participation proposed by Arnstein (1969), Pretty (1995) and others. The disavowal of contentions pertaining to the scientific rigour and the likelihood of adverse socioecological and socioeconomic effects through impacts to hydrological dynamics correspond to characterisations of ‘tokenistic’ or ‘consultative’ models of participation which are characterised by a ‘top-down’ flow of ‘valid’ information as the basis for decisions. Nevertheless, in the few cases where ‘additional analysis’ was conducted, leading to the incorporation of additional information into the impact statement and the subsequent incorporation of ‘additional mitigation’ measures, the public commenting process can be said to have had a substantive influence on the extent and depth of knowledge of existing conditions and the potential impacts. Here, public contestation over the adequacy of the scientific analyses resulted in what Stengers (2005) referred to as the slowing down of reasoning in the EIS process and was thus an effective means of disrupting the trajectory of the Rosemont Copper Project for opponents.

However, it is arguable that it was more the overall volume of public comments submitted, rather than the substantive nature of their content, which made the biggest difference. While without such a level of engagement it is likely that the scope and rigour of the Final EIS would have been much less, the incorporation of mitigation measures does not account for the fundamental nature of opposition to the project as a whole. Despite the fact that the CEQ NEPA regulations and guidance make no pretensions to the decision-making process being extended to a public ballot on the final outcome, and notwithstanding the origins of NEPA in a techno-scientific rationalist approach to EIA, it is nonetheless this antagonistic element and the threat to the legitimacy of the process that necessitated the forms of disavowal expressed in the Forest Service responses.

Attending to what was identified in Chapter 2 as a relative lack of focus on the substantive ‘outcomes’ – as opposed to the ‘process’ – of public engagement in the existing literature thus leads to a focus on the ways in which the scope of possible responses to public comments and the EIS itself is structured or “overdetermined” (see Althusser 1962) by a multitude of historical institutional imperatives, served by discursive framings, norms, rules and laws, which act to delimit outcomes to



those which benefit the interests of capital. Here, the necessity to comply with the Forest Service's legally mandated role in managing lands for 'multiple use' and 'sustained yield', combined with the imperatives of the *General Mining Act* of 1872 arch over the NEPA EIS process and foreclose upon the possibility of a negative decision. Meanwhile, the necessity for all 'action alternatives' assessed by the EIS to meet with the 'purpose and need' of the proposal and the notional nature of the 'no-action alternative' represent the internalisation of bias towards any form of development within the EIS process itself.

Meanwhile, disavowals on the basis of reasonable scientific analyses, if not articulated as justifications with intrinsic validity, are further legitimised through the expansion of the scope and rigor of analyses and the assertion of having met the required standard of 'best available science'. Yet none of these scientific assessments of potential effects may be adjudged as representing a prohibitive risk to the environment or society, with the 'best available science' and what constitutes an acceptable level of impact remaining completely ambiguous delineations. As long as the requirements of the other relevant environmental legislation are separately met, the project meets the 'purpose and need' requirements, and all the necessary administrative steps are executed, then the EIS can legitimately inform a positive decision on the proposal by the lead agency. And here, in the real status of the NEPA process as a 'repository' for parallel permitting requirements such as State-level water quality laws or the federal *Clean Water Act* and the *Endangered Species Act*, lies perhaps the most significant misconception. While the EIS process appears as the primary means through which the impact of the proposed project is assessed and the public can influence the process, the critical decisions are made in separate institutions wherein technocratic rationalities often predominate and public scrutiny is limited.

In the case of the Rosemont Copper case, therefore, it is not only that, as argued by Poisner (1990: 85), a "black box" surrounds the point of actual decision-making, but rather that the final determination of the NEPA process is itself contingent upon decisions made in a number of even more tightly sealed (or completely impenetrable other than through legal challenge) black boxes located elsewhere. Indeed, it can be argued that the only legally mandated decisions that the lead agency is actually responsible for are the initial identification of a 'purpose and need' for a project and the determination of whether its environmental effects would be 'significant' - decisions which require no public involvement. The 'Final Record of Decision' which marks the end of the NEPA EIS process is, in effect, simply a confirmation of compliance with the procedural requirements of NEPA and the substantive requirements of parallel environmental laws. Thus a notional case-specific EIA process, which is intended to account for the particular environmental and social context in which

the proposal is situated, is supplanted by nationally and regionally generalised scientific criteria and parameters which are adjudicated upon in remote centres. While these permitting processes include their own provisions for public comments and engagement, they are largely administrated from the regional offices of state and federal agencies (in this case, in Phoenix). With the NEPA EIS process the focus of public attention, only those most resilient to participation fatigue will make the additional effort to engage – a logic borne out by the significantly lower levels of public comments submitted to these agencies.

Thus, dominant ideologies, political interests and power relations external to the EIS process itself produce subjectivities that delimit the scope of possible actions. As discussed in Chapter 2, it is the latter dynamic that typological interpretations of normative agency in public participation have often failed to acknowledge. By contrast, the analysis of the public comments and responses shown here represent a situation similar to that exemplified by White (1996), in which a plurality of interests in the outcomes of participatory processes correspond to greater or lesser degrees of public agency or non-agency, making the form and function of participation a site of conflict. However, beyond what White (1996) refers to as “legitimation” of predetermined decisions, those interests relating to the Rosemont mine are historically, ideologically, institutionally and discursively entrenched to the extent that, in most cases, ‘disavowal’ of alternative knowledge claims and oppositional positions is the more appropriate characterisation. Moreover, this thesis has built upon White’s call to acknowledge that the political and antagonistic nature of interests in participatory processes and the way in which the form and function may serve to neutralise and depoliticise them.

### 7.3. Power and the return of the political

Shifting the focus of analysis from what appears as an ordered, neutralised and depoliticised institutional space of governance, Chapter 6 showed how spaces of association extrinsic to the NEPA EIS process are sites into which antagonistic energies overspill. The Rosemont case thus comes into focus as a heterogeneous affair that entailed the mobilisation of resources and actors both ‘inside’ and ‘outside’ of the state (Murdoch 2006). Therefore, there were not just spaces of what Foucault (1977) referred to as “disciplinary power”, but spaces of relative autonomy, in which multiple subjectivities, framings and actions may exert agency. Drawing upon the archive, participant-observation, and in-depth interviews with key actors, this chapter thus described how power is articulated through agents in different institutional contexts: those who straddle – or are more or less embedded within – the domains of the institution and civil society; those with relatively more or less autonomy within hierarchical structures. Thus, the behaviours of key actors (parallel environmental permit administrators and cooperating agency staff) who are proximate and

responsible directly to political figures at the level of the State of Arizona may reflect a structured coherence to their discourses and actions (Giddens 1984). Those with a greater degree of physical and/or hierarchical separation – or a greater level of local embeddedness – negotiate their personal or professional perspectives against institutional discipline.

Chapter 6 began by exploring the ways in which discursive framings and narratives relating to mining, the Rosemont Copper Project and its impacts have been constructed by various groups with interests in advocating and opposing its construction. It showed how the themes identified from the analysis of public comments reflected how particular ideas were used to mobilise support and demobilise opposition to different arguments in the EIS process and the various other spaces of interaction (see Lindekilde 2014). Proponents – Rosemont Copper, in league with various groups of the mining lobby, chambers of commerce, and supported by the advocacy of the Arizona Geological Survey – mobilised significant public engagement in the public meetings and commenting process. The nature of this engagement strongly reflected the framings and narratives promoted by this coalition of proponents through an extensive marketing and public relations effort led by the mining company.

From the discussion in Chapter 6, therefore, proponents can be said to have engaged in what Gavin Bridge (1998: 219) termed “discursive regulation” of the ecological and social contradictions that constitute opposition to mining. In addition to anti-environmentalist framings and the appropriation of ecological and cultural discourses that Bridge (*ibid*) highlighted, however, the Rosemont case exemplified a further aspect. Here, a ‘chauvinist’ (see Jóhannesson 2007) phase married nationalistic and regional narratives of American industrial supremacy and individual freedoms to the mine (see Table 7.1). This discursive regulation of the contradictions of mining can, furthermore, be said to have been internalised by the Forest Service through the disavowal of public concerns on the basis of sustainable mining techniques as mitigation measures. The state thus assimilated the ecological phase of capital (Bridge 1998) whilst tacitly endorsing its anti-environmentalist and chauvinist phases through entrenched institutional norms around ‘multiple use’, ‘sustained yield’ and ‘purpose and need’.

This process entailed the framing of certain discourses and discursive materials “so that one set of meanings rather than another is conveyed” (Snow 2004). Thus, “prognostic” framings of ‘what should be done’ were foregrounded as solutions to “diagnostic” (Lindekilde 2014: 206) framings in which themes such as jobs, economic crisis and public services were problematized on one side of the debate, while issues such as water, endangered species and existing livelihoods were highlighted on the other side (see also Hassenforder *et al.* 2016). Meanwhile, discourses around identity and

**Table 7.1 – ‘Phases’ of discursive regulation of the Rosemont Copper Project (following Bridge 1998).**

Ecological	Anti-environmentalist	Cultural	Chauvinist
Claims for modern ‘sustainable mining’ techniques that would mitigate the adverse impacts of the mine.	Construction of environmental concerns as ‘elitist’, ‘naïve’ and/or ‘nimbyism’.	Portrayal of community, state and regional history and identity as synonymous with mining.	Condemnation of policy which has led to the decline of the United States as a dominant global producer and exporter and its consequent reliance upon imported resources.
Idealised visual representation of the landscape, nature and water in promotional material as if it were a product of the mine.	Juxtaposition of ‘elitist’, ‘naïve’ and/or ‘nimby’ concerns against the autonomy, freedom and quality of life of ‘the little guy’ and the ‘harsh realities’ of recent economic crises.	Utilitarian view of ‘god given’ natural resources.	Condemnation of federal interference in State affairs as an attack on ‘freedom’.
	‘Necessity’ for mineral development and a pragmatic trade-off between production (represented as ‘jobs’ and ‘tax revenues’ rather than profits) and the environment.		

aspiration were woven into narratives of the history of the region, its unique social, economic and ecological characteristics, and the implications for future generations. These discursive formations fed into points of contestation over the course of the NEPA process, centred on a series of controversies around science and ethics.

It was around these controversies that networks of social relations, collective identities and antagonistic expressions, which were precluded in the institutional setting, emerged. In Chantal Mouffe’s (2005) terms, of scientific and ethical controversies were points of reference for the articulation of a ‘we’ as opposed to ‘they’ that constitutes the political (Mouffe 2005). Through a network of local, regional and international groups, NGOs, businesses, academia and individuals, wider public interest (and therefore political pressure and interventions in the EIS process) was generated. Financial resources were pooled, and the cause was coupled to broader campaigns focusing on issues of social and environmental justice, conservation and localism. Organisational, scientific, legal and political expertise were mustered in strategies of direct action, knowledge production, legal challenges and political lobbying. Thus, opposition groups and individuals sought to resist, disrupt, delay, subvert, contest and transform the NEPA EIS process towards their own objectives.

First, due to pressure from political actors at the county and congressional level, the Patagonia Riot forced the lead agency to reformulate the nature of public engagement, allowing voices to be heard at public hearings and leading to an extension to the public scoping period. These interventions, added to the controversy that arose from the events at Patagonia High School and the way in which that situation was managed by the Forest Service and law enforcement, fed into the level of public engagement in the Draft EIS commenting process, coordinated by the coalition of opposition groups. Meanwhile, scientific controversies relating to the rigour of analyses of impact to ecological and hydrosocial dynamics in the Draft EIS were the object of contesting strategies of knowledge production. These alternate knowledges formed the thematic nature of the public comments and forced the Forest Service to address – albeit often not substantively – the concerns of the public.

This scientific effort also informed a wider public campaign – through the press, websites, social media, events, posters and the like – to generate further support for opposition to the project among the local electorate, adding further political weight through Congressional Representatives Giffords, Grijalva and Pima County Supervisor Ray Carroll. Attention was focussed on water, a key concern for residents of this arid region, and the irreversible impacts to rare, threatened and precious riparian ‘refugia’ and the ‘refugee species’ listed under the Endangered Species Act such as the jaguar. By highlighting the plight of the jaguar in particular, and by capturing remote sensed images of what was at the time the only known jaguar in the country, the opposition efforts succeeded in capturing and articulating the agency of that animal in the political and scientific debate. Here, the artist community of Tucson entered into the debate, seeking to portray – through photography, painting, street art and dance – the jaguar, other threatened species, and ‘nature’ as objects with intrinsic and cultural value, beyond utilitarian or anachronistic visions of Arizona’s economic heritage. Indeed, the ‘Rosemont Ours’ dance project sought a human reconnection with nature, situating human bodies as ecological beings by kinaesthetically embodying the animals and plants threatened by the Rosemont Copper mine.

At the same time, more immediate efforts were directed toward legal actions and appeals against environment permit decisions as and when they were issued by cooperating agencies, leading to further delays to the process as a whole. Rather than being restricted to the domain of the opposition coalition however, this aspect of the research has shown how what Foucault () referred to as “disciplinary power” is variously reproduced, transmitted, resisted or contested by institutional actors with varying degrees of conformity or relative autonomy. Thus, the examples of the Environmental Protection Agency (EPA), the Arizona Department of Environmental Quality (ADEQ),

the Fish and Wildlife Service (FWS) and the Bureau of Land Management (BLM) showed how the coherence of certain ideologies and rationalities between political figures, executives and subordinate “boundary workers” (Jasanoff 1990) between science and policy is significant. It was among these actors that the struggle between extrinsic and intrinsic motivations was manifested in actions significant to the trajectory of the Rosemont case.

For example, while the lean manufacturing principles and instrumental rationalism of State environmental permitting procedures were adhered by ADEQ staff with direct lines of responsibility to a Governor elected on a pro-mining mandate; scientists at other agencies with different structures of responsibility and power were able to maintain subject positions as members of the local community, environmentalists and professionals, contesting the basis for those same permits both inside the NEPA EIS advisory committee and politically in the public sphere. By contrast, FWS staff, despite challenges from the opposition groups, exercised their own agency in maintaining a pragmatic position in respect to the threat to the jaguar in the impacted area relative to other priorities. Meanwhile, at the EPA, where the balance of institutional imperatives remained (at that time) tipped toward conservation, staff maintained pressure on those conducting the Army Corps of Engineers, the ADEQ and the Forest Service permitting processes (under the *Clean Water Act*, the *Safe Drinking Water Act* and NEPA respectively) and on political actors, threatening to exercise their right to veto decisions.

Meanwhile, the research conducted here has shown how boundary work may also be carried out by actors directly in the employ of capital itself, in this case through the incorporation of evidence generated by consultants for the Rosemont Copper company in the NEPA EIS process as ‘best available science’. This can be seen to constitute an ethical contradiction that brings the inequities inherent in environmental policy in the United States into even greater relief. Here, the sense of injustice at the close relationship between the state and corporate interests was exacerbated by the reprimand given to the Forest Service following allegations of contravention of the *Federal Advisory Committee Act*, in which illegal private meetings were alleged to have been held between the agency and the mining company. Moreover, there exists no legislation aimed at regulating ethical misconduct such as that which emerged in this case, in which local people were coerced, misled, exploited and misrepresented by the mining company and those lobbying on behalf of Rosemont in order to make a socioeconomic case for the mine. The significant financial resources available to the company frame, narrate and promote the mine to the public were also directed towards the suppression of information-sharing by opponents, appropriating and monopolising means of communication.

Nevertheless, in spite of these clear asymmetries in power and agency in the NEPA EIS process, what this example has shown is the failure of the political-economic apparatus to contain scientific and ethical contradictions and controversies, and the ability of a well-resourced network of to reclaim agency and re-politicise matters of concern. What Chapter 6 thus showed is a highly contested space of engagement, in which the stretched resources of the state were occupied with responding and mitigating threats to the legitimacy of the process. Contesting the scientific and ethical grounds of Rosemont Copper Project was thus a significant factor in the protraction of the EIS process beyond a period of 12 years.

#### 7.4. Contribution to debates in democratic theory

This thesis has provided a much-needed contribution to situated empirical perspectives on participation in environmental impact assessment that reflects on theorisations of a post-political paradigm pervasive in democratic governance. In its thematic analysis of the public comments and the institutional responses in the NEPA EIS process, it has provided examples that support the latter's characterisation of participatory approaches in general as exercises in techno-scientific legitimation of the imperatives of the dominant neoliberal political-economic order (Swyngedouw and Wilson 2014). By focussing on how scientific evidence is mobilised, and the significance of power and relative autonomy in the actions of state and non-state boundary workers in this legitimation effort (Jasanoff 1990), this thesis has highlighted events which link the perspectives of Science and Technology Studies on the framing and overflowing of scientific rationalism and discourse (Callon 1998) to post-political understandings of the irreducible political nature of antagonisms over matters of concern.

However, it could be argued that despite the lofty rhetoric in the Council on Environmental Quality (CEQ) regulations, NEPA never aspired to the deliberative democratic standards that Mouffe (2005), in particular, seeks a departure from. To paraphrase Latour (1991) NEPA can be said never to have been consensual. The EIS process is not, in effect, *de*-politicised but, as argued by Žižek (1999) has always foreclosed upon the political by an exclusionary, instrumental scientific rationalism. As described in this thesis, disavowal and the disciplined adherence to entrenched institutional and scientific norms result in a discursive foreclosure upon antagonistic critique. Thus, what is revealed at first is an overwhelming sense of this foreclosure of the political, even as the overtly political processes through which the post-political is constructed have been highlighted (Swyngedouw and Wilson 2014). It is a picture in which understandings of democracy are being eroded by a techno-scientific managerial paradigm that privileges certified forms of expert knowledge; and in which forms of public participation are possible on a grand scale, as long as they do not fundamentally

challenge the relationship between that knowledge and the power that lays behind its production (Swyngedouw 2011).

Beyond this techno-scientific foreclosure, this sense is further reinforced by what Ranciere (2004) referred to as the “meta-politic[al]” displacement of the political by market-based rationalities in which the primary objective of environmental decision-making – in particular for the ADEQ – is the efficient provision of a service. Thus further evidence is provided for what Wilson and Swyngedouw (2014) referred to as a welcoming, mutually beneficial relationship between the state and corporate interests. Thus, Raco’s (2016) assessment of the anti-democratic intertwining of capital and governance is shown here to be extended from the strategic domain of sustainability planning to the assessment of the environmental and social impacts of individual capital projects. Meanwhile, the absence of regulations that prevent conflicts of interests further constitutes the privileging of capital appropriation over the ecological and social risks faced by local people. Indeed, perhaps the starkest examples of the impunity granted to proponents of such projects were those which entailed the blatant and unpunished coercion, exploitation, and misrepresentation of local people in the NEPA EIS process.

Nevertheless, the occlusion of the political generates what Habermas (1975) termed a “legitimation crisis” for the relationship between capital and governance, in which the inherent social and ecological contradictions of mining must be regulated (Bridge 1998). One of the defining features of the empirical case examined in this thesis is the failure of the state and capital to regulate the fundamental contradictions of the Rosemont Copper Project, leading to an overflow of political antagonism into diverse spaces of wider association in which agency might be redeemed. Thus, what Laclau and Mouffe (1985) described as ‘surplus’ discourses were rearticulated by those whom Ranciere (2000: 124) refers to as “the part of no part” in the Patagonia Riot. Here, the emergence of controversies and uncertainties over the scope, rigour and objectivity of scientific analyses, and the nature of the role of the proponent in the NEPA EIS process, correspond to the failure to legitimise the risks of adverse externalities from the proposed mine. This crisis of legitimacy was manifest in the wake of the alleged contravention of the *Federal Advisory Committee Act* (FACA), the ‘free lunch’ controversy, the Patagonia Riot, the legal challenges to permits, the ‘uniform porous medium’ assumed by the hydrogeological modelling, and the subsequent level of public and political engagement in the Rosemont issue.

What emerged in the case of the proposed Rosemont Copper Project and the NEPA EIS process was the explosion of a wider space of antagonistic contestation. In such ‘hot situations’, which Callon (1998: 11) argued “indicate the absence of a stabilized knowledge base [...] everything becomes



controversial” (see also Whatmore 2009). Thus, while this research has responded to calls for empirically grounded approaches which focus on the extent to which post-politics is achieved in particular policy settings, it has built on Allmendinger and Haughton’s (2012) notion of the ‘displacement’ of political disagreement to other locations (see also Haughton *et al.* 2013). In the case of mining in the United States however, rather than showing NEPA as a ‘soft space’ of governance (*ibid*), more overt structural determinants emerge to displace the political, in the form of the laws and institutional norms which maintain the clear path toward resource development. This thesis has thus foregrounded the myriad emergent networks, sites and subjects, human and non-human, across domains of the state and civil society, through which: the we/they constitution of collective identities (Mouffe 2005) precluded from the NEPA process could be asserted; through which ‘returns’ of the political are manifested (Dikeç 2005, Swyngedouw 2011); and through which scientific and ethical controversies are seized upon as ‘political opportunities’ (Cowell and Owens 2006) to reclaim democratic space.

Thus, the trajectory of the Rosemont Copper Project has been shown to be subject to the interplay of multiple networked actors and ‘actants’, with varying levels of power and autonomy, engaged in relations which bisect heterogeneous institutional and non-institutional spaces (Latour 2004). Yet, with the project having received approval from the Forest Service with a Final Record of Decision in June 2017, it was only the ‘trajectory’, and not the ‘destination’ that was successfully contested. Notwithstanding the outstanding Section 404 Clean Water Act permit and the inevitable legal proceedings that will follow, the political-economic structures of power which underpin institutional discipline are deeply rooted the relationships between the mining lobby and elected officials. They are buttressed by complementary norms and corporate rationalities within environmental agencies. And they are legitimised by the strength of a popular identitarian narrative of mining in Arizona. While the NEPA EIS process may have failed in discursively regulating the contradictions of the Rosemont mine, these hegemonic edifices were ultimately impervious to the ‘returns’ of the political.

The Rosemont case has shown that in the last instance, without radical regulatory reform and increased regulation at the federal and state level, the democratic capacity of the NEPA EIS process, is delimited by the relations of political and economic power operating at the executive level of politics. It is delimited by elected politicians and governors, whose power – and their subsequent rationalities and technologies of governance – is contingent upon campaign finance linked to mining capital. It is delimited by key state actors, directly responsible to those political figures, who see (or are disciplined into seeing) the role of environmental governance as forming transparent

relationships with capital and issuing permits as quickly as possible, and view the primary task of science and technology as expediting that role. In which exploitative, unethical and manipulative conduct has no repercussions, and in which conflicts of interest in the production of science and the relationship between the state and corporations are similarly accepted. Perhaps most significant, however, is the primacy of federal mining laws which permit the sale of public lands at a vastly subsidised rate.

Seeing as the 'purpose and need' for development of mineral resources on public land is enshrined as a 'right' in United States law; that this right is enshrined in the cultural imaginary of many of the vote-casting American public; and that the enactment of legislation and the success of efforts to repeal or reform it is subject to the ascent of law-makers whose election is largely contingent upon campaign financing through political action committees and corporate lobby groups such as those which advocate for the mining industry; the scope for opposing any mine was thus always contingent upon the articulation of the existing neoliberal configuration of relations of political economic power in the United States. In this case, after 12 years, opponents of mine may just as well have pushed the Rosemont conflict beyond what Jasanoff (2011) would call a "constitutional moment" in the relationship between politics, science, policy and environmental management; leading to a reconfiguration of power and tipping the balance towards a more precautionary, less instrumental and more democratic rationalism. In the event, with the election of Donald Trump as President of the United States in 2016, what occurred was the opposite, with particular implications for the role of the Environmental Protection Agency – one of the most vociferous and powerful critics of the Rosemont project. This is a development that, only due to the temporal scope of this research, will have to be for others to analyse in more detail.

Nevertheless, what this example goes some way to demonstrating is Mouffe's oft-repeated refrain that "things could always be otherwise" (Mouffe 2005: 18, Mouffe 2013: 2). It goes to the heart of Mouffe's conception of hegemony as a social order of things which is only:

the contingent articulation of power relations that lacks an ultimate rational ground. Society is always the product of a series of [hegemonic] practices that attempt to create a certain order in a contingent context. [...] Every order is predicated on the exclusion of other possibilities. [...] It is in this sense that every order is political. [...] The present state of globalization, far from being 'natural' is the result of a neo-liberal hegemony, and it is structured through specific relations of power. This means it can be challenged and transformed, and that alternatives are indeed available (ibid 2013: 131).

As Bridge (1998: 238) has argued, the deployment of discursive formations such as 'best available science' and 'sustainable mining' is often "ephemeral, partial, and contradictory and as such it opens

up new possibilities for opposition.” This thesis thus reveals the extent of the post-political disavowal and foreclosure of democratic agency, and the incompleteness and vulnerability of that process to disruption (Swyngedouw and Wilson 2014).

#### 7.5. Overall contribution

That corporate capital is able to manipulate policy and decision-making, and that policy and decision making is biased towards the interests of corporate capital, have become truisms so taken for granted as to have receded into the accepted natural order that constitutes neoliberal hegemony. What this research, focussing on the example of mining and the substantive agency of public participation in environmental impact assessment, has shown is the actually existing processes of disavowal and legitimation through which this order is maintained; and through which the knowledge claims and democratic agency of public participants are excluded. Relating this example to conceptions of the ‘post-political’ nature of democratic governance, which assert that foreclosure and disavowal of antagonism, equality and class struggle are the primary means through which the neoliberal consensus is reproduced, this thesis has thus responded to calls to empirically substantiate abstract theorisations that may be at odds with how situations play out at the levels of policy and practice (Dean 2009, Featherstone and Korf 2012). In other words, by moving from the institutional *meso*-level of participatory policy to the broader spatial relations of power, networks of heterogeneous association and the *micro*-level ‘hot situations’, this thesis has responded to calls to relate empirically-grounded accounts to *macro*-level theories of the post-political and the post-democratic.

This thesis builds on the recent work of a number of researchers on post-politics in the disciplines of geography and spatial theory (see Barnett 2012, Dikeç 2002, 2005, 2012, Featherstone 2008, Geiser 2012, Kothari 2012, Meyer *et al.* 2012, Schlichte 2012, Spencer 2012), in respect to global climate change (Swyngedouw 2007, 2010, 2011), urban politics (see Dikeç, 2002, Paddison 2009, Swyngedouw 2009, Oosterlynck and Swyngedouw 2010) and spatial planning (see Allmendinger and Haughton 2012). In particular, it addresses a relatively unexplored field in respect to post-political theory, that of Environmental Impact Assessment, building on earlier responses to criticisms that the approach has been under-theorised (see Bartlett and Kurian 1999, Lawrence 2000, O’ Faircheallaigh 2010), particularly in the case of NEPA. Moreover, the research conducted here seeks to fill a space in the literature that moves beyond analyses of the ‘process’ of public participation in general (see Charnley and Engelbert 2005, Del Furia and Wallace-Jones 2000, Diduck *et al.* 2007) and its application in EIA, to consider its substantive ‘outcomes’. In so doing, it has provided a case example from a geographically and historically specific socioecological and socioeconomic context, that

considers the particular implications for mining project in the semi-arid, water-scarce region of Southern Arizona.

As has been explored, the particular object of the EIA in question - a proposed copper mine in the United States – presents particular issues in relation to the legal-institutional frameworks which regulate mineral extraction and environmental protection in the country. Furthermore, the significance of the co-contingent relationships between mineral extraction and water resources in a semi-arid region poses specific questions of the scope and rigour of scientific analyses of risks. These facts make the ever-present possibility of antagonism and conflict even more immanent, yet they also expand the scope for the re-politicisation of issues which concern those who would be directly impacted by the proposed project. Thus, this thesis builds on the considerable body of political ecological (PE) accounts of the nexus between capital, government, mineral resources, water and communities in the global south (e.g. Bury 2005, Emel and Huber 2008, Himley 2013, Hindery 2004, Li 2009, Szablowski 2002) by offering an example from a North American context. It also adds a further aspect to this arm of the PE literature which has thus far had minimal engagement with post-political theory. Here, the hybrid material nature of water and the subsurface and their relationships with humans and other non-human ecologies can be said to have exerted their own agency in the Rosemont case, contributing to the destabilisation of the knowledge base the EIS process.

#### 7.6. Recommendations

Notwithstanding the democratic deficit that can be said to characterise the NEPA EIS process, the publics who I have highlighted in this thesis do not hail from marginalised or vulnerable communities. Most of them live lives of relative privilege, safety, convenience, leisure and economic security. That much of this privilege stands in stark contrast to the fortunes of the region's original inhabitants - the ancestors of today's tribal communities in the southwest, whose rightful claims on the land and water predate all others – is an aspect that is not explored by this thesis, and one that demands much greater scholarly attention in respect to environmental governance in the region. For these people, and those in other settings who can truly claim to represent 'the part of no part', the implications of such projects pose a far more serious, often existential threat. In places such as South America and Africa, the very act of opposition to extractive projects carries with it the risk persecution, expropriation, violence or murder. Thus, while accepting that an ultimate destination at which all antagonisms may be resolved and at which real democracy itself may be 'achieved' is impossible, it is surely incumbent upon those societies with the capacity to bring new, more inclusive, if never totalised spaces of democratic knowledge production and decision-making within the scope of governance.

Such a project must not only be aimed at displacing the instrumental rationalism and the exclusionary negation of antagonisms which constitute political agency, but must also regulate against exploitative conducts that are the product of the relationship between capital and the state. It is here that Chantal Mouffe's call for 'agonistic' spaces of democracy comes into focus. Her conceptualisations of hegemony and antagonism assert a negativity that is constitutive and that can never be overcome. They highlight the existence of conflicts for which there are no rational solutions, in which the final reconciliation of all views is impossible. Thus, she argues, as neither an absolute neoliberal consensus nor absolute democracy are achievable end states with ultimate destinations, and the denial of conflict is thus a denial of politics itself. In response, Mouffe advocates not only the abandonment of the Habermasian view of an 'ideal speech situation', which fails to recognise this absent ground, but also the reformulation of democratic spaces so that the friend/enemy relation is displaced by one between adversaries who recognise the demands of their opponent (Mouffe 2005), thus:

[w]hile recognising that there is no rational solution to their conflict, these adversaries nevertheless accept a set of rules according to which their conflict is going to be regulated. What exists between these adversaries is [...] a conflictual consensus – they agree about the ethico-political principles which organize their political association but disagree about the interpretation of these principles (Mouffe 2013: 139).

While this thesis can make no claims as to what a conflictual consensus might look like in practice, it certainly offers lessons on some ethico-political principles that might constitute such a space, and what policy reforms would be necessary for an agonistic politics to be realised through the NEPA EIS process. The following can be seen as a list of fundamental reforms, many of which will themselves require research beyond this thesis as to how they might best be achieved.

1. Radical reforms to political campaign financing laws to prevent undue influence of corporate lobbies over public policy and decision-making.
2. Strict regulation, monitoring and enforcement against ethical misconduct on the part of all participants in the NEPA EIS process, including that which seeks to coerce, exploit, misinform or misrepresent the public through engagement in the NEPA EIS process.
3. Further regulation against conflicts of interest between government agencies and corporations, including ensuring the objectivity of any external scientific input. This must include the prohibition of the use of scientific information, other than that provided in the plan of operations, recruited by the proponent.

4. In recognition of the conflicts and protracted costs generated through present arrangements, and the necessity to resource the above reforms, significant increases to funding for federal agencies conducting NEPA EIS processes, reversing the current trend toward deregulation and rationalisation in environmental governance.
5. Pass the proposed *Hardrock Leasing and Reclamation Act*, introduced by Senator Raúl Grijalva that would: eliminate the privileged status of mining claims on public land; allow mining to be managed through the NEPA EIS process, with clear authority for federal land managers to reject a mine proposal if it would cause unacceptable damage to public lands or resources; establish a meaningful royalty on mining operations and a per-ton fee on displaced material from mining, sufficient for the remediation of decommissioned mines across the country; establish strong reclamation standards and bonding requirements upon mining companies; protect designated conservation areas from mining operations.<sup>185</sup>

In respect to the latter recommendation, the evidence from this research highlights the significance of the current necessity for all ‘action alternatives’ for consideration in the NEPA EIS process to meet the ‘purpose of and need for action’. It is this rule, in combination with the existing mining laws, that represents a fundamental limit to the democratic capacity and bias toward mining capital in the United States environmental governance. Moreover, while accepting the necessity of mineral extraction for modern society, reforms to the mining laws must be accompanied by due consideration within the NEPA EIS process that engages with the positive economic claims for the mine, which often remain unchallenged. Thus, in addition to public interests in the equity of the distribution of benefits of mining (alongside the analysis of socioecological and socioeconomic risks), which would to some extent be addressed through the above reforms to royalties, due analysis of the nature of capital interests must be part of the analysis. This must include consideration of the ‘destination’ of revenues and profits, including the level of direct local employment, wages, workers’ rights, safety, due diligence as to the company’s past environmental and economic performance and ethical conduct.

With the above reforms in place, the benefits of the creation of an agonistic space of participation within the NEPA EIS process itself can be envisaged in the potential for such an approach to internalise and productively rearticulate the surplus political energies that the current configuration precludes.

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<sup>185</sup> See: <https://www.congress.gov/bill/115th-congress/house-bill/5753/text>

This thesis has shown the extent to which the social and ecological contradictions of mining in semi-arid zones – and, therefore, the major points of antagonism – are mediated through flows and qualities of water. It is thus here that the ‘catchment’, as the object around which an agonistic spaces of public engagement in impact assessment might be constructed, emerges into view. At the strategic level, catchment scale management planning has been implemented in Europe through the EU’s Water Framework Directive. The approach has weaknesses, including those relating to the problems caused by the incongruity between river basins and political boundaries. Moreover, the geography of the southwestern United States and the intermittent and ephemeral nature of surface watercourses poses further challenges for this delineation. However, the transitory and immanent nature of impact assessment permits a less formal definition of the catchment, to include all of those implicated material, ecological, socioeconomic and cultural phenomena to which water is intrinsic.

Future research, itself employing participatory methods such as focus groups from within such citizens’ councils, should investigate the potential for such a ‘hydro-social’ catchment-scale framing to form the basis for agonistic spaces of engagement. Consisting of a wide range of interests such as that which was engaged in the Rosemont case, including local people, NGOs, scientists and other groups, the scope for the mandatory incorporation of citizens’ councils into the NEPA EIS advisory committee should be investigated. Through such means the ‘best available science’ and the interests currently served through the deployment of that power-laden, instrumentally loaded phrase, may be displaced by a co-produced (e.g. Callon 1999), situated knowledge base that is all the more stable for its embodiment of agonistic politico-ethical principles.

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