AWFUL BEAUTY: MAPPING TOXIC LOCATIONS IN THE AGE OF THE ANTHROPOCENE

An Exegesis submitted by

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ABSTRACT

Using practice-based methodology, the research ‘Awful Beauty: Mapping Toxic Locations in the Age of the Anthropocene’, engages environmental issues through works of art that ‘map’ toxic locations of mines in Australia, with Australia being the most highly mined country in the world. The exegetical component includes an extensive discussion of the artworks that reference abstract geographical ‘maps’ of selected areas within Australia. These show how the land has been impacted and degraded during the Anthropocene by deforestation, mining and its by-products and land clearing for industries. Data mining became the later focus because of the amount of power used and the subsequent emissions from power stations. These works are further contextualised through a discussion of the related art practices of other artists. The object of these ‘maps’ as art is to stimulate discussion about the human effects which have impacted our environment and what measures can be taken to rectify that damage and perhaps encourage research into alternative, more sustainable practices. After extensive traditional and non-traditional research, the artwork has culminated in a series of abstract maps named “Awful Beauty” that reflect the extensive environmental damage to our country.

CERTIFICATION OF THESIS

I Loi Magill declare that the DCA Thesis with a creative work component entitled 'Awful Beauty: Mapping Toxic Locations in the Age of the Anthropocene' consists of the specified word length of 39,733 words, including quotes and exclusive of tables, figures, appendices, bibliography, references, and footnotes. My creative component comprises 60%, with the traditional research being 40% of the overall practice-based research project. The work is original and has not previously been submitted for any other award, except where acknowledged. I have acknowledged any key collaborators and their level and type of contribution, where deemed appropriate in the statement of contribution.

Date: 18 April, 2024.

Endorsed by:

Dr David Akenson
Principal Supervisor

Associate Professor Kyle Jenkins
Associate Supervisor

Student and supervisors' signatures of endorsement are held at the University.

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DEDICATION

For my lovely stubborn brother, for your courage and determination.

Howie, love you heaps.

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ABBREVIATIONS

AIATSIS.....Australian Institute of Aboriginal and Torres Strait Islander Studies
AI .....Artificial intelligence
BHP .....Broken Hill Proprietary Company Ltd
BTC ..... Bitcoin
CSIRO ..... Commonwealth Scientific and Industrial Research Organisation
DCA ..... Doctor of Creative Arts
UK .....United Kingdom
US .....United States

INTRODUCTION

Earth provides enough to satisfy every man's need, but not every man's greed.
Mohandas K. Gandhi (1869-1948), quoted in EF Schumacher, *Small is Beautiful.*

In the introduction to his book 'How to Lie with Maps', Mark Monmonier[1] declares that 'not only is it easy to lie with maps, it is essential'. If a map of a three-dimensional world is to be portrayed on a flat sheet of paper, distortions are inevitable. Distortions are a feature of maps, not a flaw, because they must take the form of abstractions of usually larger, more detailed locations. Likewise, representation is *not* a re-presentation of an external truth or fact, but rather an abstraction or approximation of the referent. Mapping the scene by cartography or visual art shares this one feature: they are both abstractions. Seen in this context, cartography is both a science and an art. The current research project draws on science through data analysis and its application to non-traditional research, but my focus is aesthetic, what is being referred to as 'Awful Beauty'. The word 'awful' is a deliberate play on the etymological roots of the word, having an historical link to the word 'awe' which is closely related to both 'reverence' and 'terror'. However, it also references the modern day meaning where it is used to emphasize the extent of something unpleasant or negative, which the effects of mining on the land are examples. This is presented through non-traditional artworks that evoke feelings as much as to provoke reflections on such feelings, and the broader socio-cultural context. In much the same way as landscape painting 'mapped' the territory or scene, the artworks are presented as abstract maps, that 'map' certain locations, such as scarred landscapes from mining and the associated waste storage of toxic ponds - subjects usually avoided by traditional landscape artists.

[1] M. Monmonier, *How to Lie with Maps,* 3rd edn, The University of Chicago Press, Chicago, 2018.
NOTE: There are countless definitions of beauty. The term 'Beauty' I derive from Kantian aesthetics. According to Kant who was the primary source of modern notions of beauty 'The beautiful is what is presented without concepts as the object of a universal liking'. I. Kant, *Critique of Judgement,* Translated by Werner S. Pluhar, Cambridge, Hackett Publishing Company, 1987, P. 53.

Such are the abstract ‘maps’ submitted for this practice-based research enquiry, which investigates geographical locations that have been altered by the presence of human activity during the Anthropocene epoch, a term given by scientists to the recent period in Earth’s history, when human activity started to have a significant impact on the planet’s climate and ecosystems.[2]

These geographical locations are found on some maps, but what the maps don’t reveal is the change to the landscape from various activities such as mining, something Google Maps, using satellite imagery, has recently revealed. However, while Google Maps can show these locations, if the public are not actively seeking this information, the technology won’t offer it. Algorithmic bias is just as likely to direct the search toward, for example, climate change denial. This is where art can assist. When we present non-traditional research in a dedicated space such as an art gallery or museum, the audience, I would argue, is focused and primed to respond to a proposition encapsulated by the artwork and any accompanying traditional research. This DCA project aims to ‘map’ these altered geographical locations through both non-traditional or artistic means, and through this exegesis.

The Anthropocene, is a term stemming from the Greek terms for human ('anthropo') and new ('cene'), but its definition is controversial. It was first coined in the 1980s then popularised in 2000 by Dutch atmospheric chemist Paul J Crutzen and American diatom[3] researcher Eugene F Stoermer.[4] The two suggested that humans are living in a new geological epoch where we have become the single most influential species on the planet, causing significant global warming along with changes to land, environment, water, organisms and the atmosphere. However, historians and anthropologists have questioned the reference to Anthropos, the generic human being. According to them, humans have always had an impact on their surroundings,[5] and as such, the debate is long and complicated and cannot

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[2] National Geographic, ‘Anthropocene’, *Education*, (2022), https://education.nationalgeographic.org/resource/anthropocene/ accessed 6 Sept 2022.
[3] NOTE: Diatom is a member of a large group comprising several genera of algae found in oceans, waterways and soils.
[4] K. Pavid, ‘What is the Anthropocene and why does it matter?’ Natural History Museum (n.d.), https://www.nhm.ac.uk/discover/what-is-the-anthropocene.html accessed 6 Apr. 2022.
[5] L-R. Issberner & P. Léna, ‘Anthropocene: the vital challenges of a scientific debate’, The UNESCO Courier, Wide Angle (2018), https://en.unesco.org/courier/2018-2/anthropocene-vital-challenges-

become the main focus of this exegesis, but suffice to say, that the Anthropocene and its environmental issues have become the background or broader context for the artworks submitted for examination. The Anthropocene is divided into three parts, firstly, the Industrial Revolution with the invention of the steam engine, secondly, the spread of mass production of goods – one of the largest contributors to greenhouse gas emissions worldwide – and lastly, the digital age which has enabled the research for this exegesis submission, and motivated the artworks submitted for this Doctor of Creative Arts.

The overall aim of this Doctor of Creative Arts project is to create abstract geographical ‘maps’ and digital ‘maps’; as artworks that demonstrate how selected environments within Australia have been impacted by the effects of the Anthropocene. It is my hope that such works, coming in the form of aesthetic propositions, rather than scientific data, may disarm some viewers and inspire them to contemplate their relationship to the natural world, prompting discussion and perhaps raising awareness of such degrading impacts on our land.

Even though the submitted abstract ‘maps’, in some cases are believable representations of place, that is to say, the locations are recognisable from a Google search of an area, they cannot, and do not, pretend to tell the whole ‘story’ of these locations, since it is impossible to show, for example, dust clouds shrouding the landscape from mining operations, or odours that could be emitted from such locations or leached toxins into the ground below. Some artistic licence has thus been taken to evoke such conditions. Some mapping principles are adhered to, but in most cases, once again, some artistic licence has been taken in the production of the artworks. As abstract representations of place, mapping can be considered inaccurate since the Earth is constantly moving and changing, with shorelines being reshaped through the constant action of the sea, and the inland subject to forces both natural and unnatural. No map can cover this fluidity in its entirety. These maps become aesthetic propositions to guide viewers on a journey of thought from what our land (Australia) once was to its current state. Where once there may have been

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scientific-debate#:~:text=The%20concept%20of%20the%20Anthropocene,anthropos%2C%20the%20generic%20human%20being accessed 24 Mar. 2023.

rolling hills, stands of ancient trees, habitats for all kinds of animals, now views are interrupted by enormous gas fields, fenced-off mines and great expanses of open cut mines; gaping holes which can be seen from space, for example, the Super Pit in Kalgoorlie, Western Australia.

In Katharine Harmon's book *Map as Art*, 2009, map artists play with cartographic conventions using a variety of materials such as sandpaper, plexiglass, plaster, acrylic, fibreglass, collage, MDF and even vellum, a translucent-type paper. She suggests 'the language of maps, as developed over time, is a beautiful one filled with artistic potential'.[6] That 'potential' is what the current works created for this Doctor of Creative Arts aims to explore. To do so, I have largely adopted, and adapted, traditional map drawing conventions. Other substantial sources of information have been old atlases abandoned in opportunity shops (op shops), internet research, and the Google Earth platform, which has become indispensable in locating areas of interest within Australia and showing more than traditional maps allow, by being able to observe, for example, the toxic leaching ponds of mining locations, made 'beautiful' by their swirling colours and patterns.

My interest in maps began many years ago and has lasted a lifetime, capturing my sense of adventure and love of travel. The signs and symbols of maps, the topographical and bathymetrical lines pushed me to find out more about where I was in the world. The lines on a topographic map connect points of equal elevation and can take the form of a detailed record of a land area or simplified abstraction[7] with bathymetrical lines connecting points of equal depth.

My sense of adventure relates back to the early to mid-20th century English children's writer Enid Blyton's Famous Five books, in particular, *Five on a Treasure Island* (1942) where a group of children had so many adventures one could only dream about. At the age of seven, my first map was of the back garden, which was my 'treasure island'. The boat to sail to that island was dug into the vegetable patch

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[6] K. Harmon, *The Map as Art, (*New York, Princeton Architectural Press, 2009).
[7] Kaim, D. et al 'Uncertainty in historical land-use reconstructions with topographic maps'. *Quaestiones Geographicae,* 33.doi 10.2478/quaego-2014-0029 cited in C. Ginzler, C. Loran, S. Haegi, 'Comparing historical and contemporary maps – a methodological framework for a cartographic map comparison applied to Swiss maps' *International Journal of Geographical Information Science, 32/11* (14 Jun 2018) 2.3.1. https://doi.org/10.1080/13658816.2018.1482553, accessed 18 Nov 2021.

after the style of an uncle's clinker-built fishing boat. My crew were my neighbourhood friends and the mast was a tomato stake. Since then, poring over maps and the ensuing travels have captivated me to the point where I wanted to investigate the function, aesthetic and claims to accuracy, and of course compile my own maps.

This study then elaborates on my early interest in maps and shows the gradual progression towards this final submission which commenced with the problems of rising sea levels of Port Philip Bay in Victoria, to the Antarctic, extinct lakes and the Great Inland Sea which covered nearly one-third of Australia, which in turn gave way to researching the problems of large-scale mining and its effects on our land. This entailed researching large-scale clearing of land, grand scale mining and the resultant tailing ponds that can leach toxins into the land and the water table and can unleash other detrimental effects into the atmosphere. My abstract geographical maps concentrate on changes to the land since the inception of the Anthropocene period and show where my related studio research is positioned within historical and contemporary fields. These abstract maps reveal ways of introducing information conceptually through abstract ideas and metaphors.

Preliminary investigations commenced with research into the shorelines of Port Phillip Bay in Victoria, of particular interest since I have resided and continue to reside there. These shorelines had shifted over time (and are likely to continue to do so into the future), possibly caused by the melting Antarctic ice. From there I turned my attention to other areas in Australia where land changes had taken place over time. This included the research into Lake Bungunnia, an extinct lake that formed part of the Great Inland Sea. Further research revealed that The Great Inland Sea was an area of vast possibilities because it had once covered one-quarter of Australia, the remainder is now known as the Great Artesian Basin. The southern part of that Basin is the Murray-Darling Basin and one of the world's largest and most productive river basins, providing one third of Australia's food supply and accounting for $19 billion of agricultural output. It also supports a diverse array of

animals, plants and ecosystems of national and international significance.[8] For this reason, I undertook a series of works responding to the original location of the Great Inland Sea. This idea proved to be unmanageable because of the envisaged size of the work and the limitations of my studio space, but it did prepare the way for the later works that led to the series 'Altered States', which focussed on mining in Australia, which was ranked No. 1 of all countries with Western Australia ranked the highest of any mining region in the world.[9] The earlier 'maps', although of interest, would not have been sustainable over a three-year doctoral research project. This necessitated further research into other locations damaged by the presence of human activity, including data sites that drive what's called 'data mining' and contribute significantly to carbon emissions. This later research resulted in a body of works captured in Chapter 4, Final Outcomes.

This exegesis is divided into four chapters, each of which identify and expand on separate but interrelated aspects of the overall research topic – 'Awful Beauty: Mapping Toxic Locations in the Age of the Anthropocene'. Chapter 1, Survey of the Field, introduces the idea of the grid system deployed in this project, engages the key literature and methods of making, by firstly discussing the theoretical underpinning of the submitted works and the relation to the artworks or non-traditional component of the research. Secondly, it reviews the historical background of mapping, and thirdly it reviews historical and contemporary artists whose practice is engaged with mapping, and finally briefly describes the selected geographical territories. Essentially, the chapter will contextualise the studio research and demonstrate its place in the broader visual art field.

Chapter 2, Research Methodology, discusses more fully, different terminologies associated with practice-based and practice-led methods in relation to my way of working as a visual artist and researcher. The number of terms and interpretations of these methodologies developed for non-traditional research has

8 The Nature Conservancy, Australia, 'Protect the Murray-Darling Basin' , 2024, https://www.natureaustralia.org.au/donate-to-our-mission/donate/help-protect-the-murray-darling-basin/?gad_source=1&gclid=Cj0KCQjwq86wBhDiARIsAJhuphmweXQMf2nPyD4hVna47QkinuI6JmAeepg1kHtgrIsOgRnt0D80JDEaAuFhEALw_wcB, accessed 9 April 2024.

9 T. Constable, 'Australia is the highest-rated mining region for Investment Attractiveness, Minerals Council of Australia', 2022, https://minerals.org.au/resources/australia-is-the-highest-rated-mining-region-for-investment-attractiveness/

made the deployment of them quite difficult. Several scholars had differing ideas on those methodologies, such as Barbara Bolt and Estelle Barrett who claim that practice-led research is a generative enquiry that draws on subjective, interdisciplinary and emergent methodologies that have the potential to extend the frontiers of research, while Lyle Skains claims that the creative act in practice-based research is an experiment, designed to answer a directed research question about art and the practice of it, which could not be answered by other methods. Linda Candy differentiates between the two,[10.] claiming 'that there are two types of practice related research: practice-based and practice-led, where if a creative artefact is the basis of the contribution to knowledge, the research is practice-based and if the research leads primarily to new understandings about practice, it is practice-led' and finally, Graham Sullivan, claims that the two research models – practice-based and practice-led – are the same and finally, Hazel Smith and Roger Dean suggest 'research-led practice and practice-led research should not be seen as separate processes but rather as an iterative cyclic web' As can be seen by these revelations and after much reading and consideration I ultimately chose practice-based research. Such a research methodology plays an important part in new understandings about practice and therefore is suitable to my broader research process[11].

Chapter 3, Preliminary Investigations, is an explanation of the initial part of this research which reveals the projects undertaken and discusses in detail the thoughts, planning, methods, practical processes and visual outcomes undertaken, ultimately identifying where the environment has been drastically changed by human intervention and mapping those interventions and the resulting damage. While there are a variety of ways to map, the forms of mapping engaged are specifically related to environmentally impacted geographical locations, I have focussed on Australia and the Antarctic, of which Australia has sovereignty over 42% of the continent rather than embrace the environmental problems of the whole world. Making use of contemporary maps, the first part of this investigation was concerned with the past,

[10] L. Candy, 'Practice-Based Research: A Guide', *Creativity & Cognition Studios*, *University of Technology, Sydney*, (2006), 1, https://www.creativityandcognition.com/wp-content/uploads/2011/04/PBR-Guide-1.1-2006.pdf, accessed 2 May 2022.
[11] NOTE: For further justification of this research methodology, please refer to Chapter 2.

present and future, anticipated the rising sea levels of Port Phillip Bay in Victoria, where I live, and in part, the melting ice shelves of the Antarctic, located due south of Port Phillip Bay. The extinct Lake Bungunnia and the Great Inland Sea have also formed a large part of this research and have been submitted as artworks in the 2023 Exhibition at the University of Southern Queensland.

An interesting suggestion was made by the examination panel during my Confirmation of Candidature which was to consider including digital projections as prompts for further works. The idea of the simulacrum which is raised in the theoretical underpinning in Section 1.2 led to a series of digital projection works that map certain locations and reveal the outcome of human intervention on the landscape. The logistics of this were considered and to pursue this idea, I purchased a projector and experimented with images. At the end of Chapter 3, I developed this idea which is addressed more fully in that chapter by producing short digital projections addressing toxic waste from tailing ponds located at various sites such as the Olympic Dam in South Australia and the Telfer Gold Mine in the Pilbara.

Chapter 4, Final Outcomes, forms the latter part of the investigation and is centred around mining operations and the detrimental effects of that mining, highlighting the problems of by-products such as the tailing ponds which include toxic and harmful chemicals such as ammonia, mercury, and naphthenic acids. The water containing these chemicals is toxic to animals, particularly aquatic organisms. Other damage to the environment is by deforestation, causing climate change, desertification, soil erosion, dust pollution, lower crop yields, flooding and increased greenhouse gases in the atmosphere, plus a host of problems for Indigenous people living on their traditional land. This chapter has involved extensive research using the Google Earth digital platform and has heightened my awareness of our beautiful planet, confirming my theory that maps may show you where to go, but cannot tell you how beautiful a place might be, or how much it has been altered by human activity. Maps traditionally lie, or rather, to invoke Baudrillard[12], they create the territory the author or maker of the maps wants others to see. They create the

[12] Baudrillard,J., *Simulacra and Simulation* (University of Michigan Press, 1994), https://www.google.com.au/books/edition/_/9Z9biHaoLZIC?hl=en&gbpv=1&pg=PA1&dq=Baudrillard,J.,+Simulacra+and+Simulation+university+of+Michigan+Press, accessed 7 Oct. 2021.

impression that all is well. Other damage to the environment researched was the nuclear testing at the remote location of Maralinga in South Australia during the 1950s-60s which has had residual effects on the land, now unusable for the next ten thousand years. The site is closed to the public, except for once-monthly tours offered by the Maralinga Tours[13] of South Australia.

The point of mapping in the way it is being used here, refers to the idea of directing people, through works of art, to areas and conditions you won't find on traditional maps, or traditional forms of landscape painting. Maps as works of art, 'map' the destruction to the environment that is not covered by the traditional map. Framed by the gallery site through exhibition, these maps as works of art, focus the viewer on the relevant issues – cutting through the 'noise'. While it is not the intention of this research to 'solve' the problem, according to Elise Gout of the Columbia Climate School, the 'artist as witness' can make a humble, but significant contribution by 'sharing other representations of the natural world', enhancing public engagement; a public who 'internalize, and respond to information more effectively than [the presentation of] facts alone'.[14] In other words, the traditional map, or the science, will only contribute so much to the education and motivation of the public. Art too, can play an important role.

After several ideas were trialled and the production of experimental maps as the non-traditional component was undertaken, my final response to these investigations has manifested in a broader range of media and processes resulting in the production of thirty watercolours, seven photographs of glass artworks printed on metallic paper and one on Lightbox-film and a series of digital projections. Most of these were exhibited in A Block Gallery at the University of Southern Queensland in June 2023 and discussed in this exegesis. The most recent works are extrapolations of those ideas, media and processes. It was after the first exhibition that the topic of 'data mining' presented itself in the way of a question, about mining in the digital age, where the toxic product of such 'mining' once again is hidden and not found on the 'map', so to speak. This realisation triggered further research and artwork

[13] NOTE: Tours are run by Maralinga Tours - https://maralingatours.com.au/contact/
[14] E. Gout, 'Emotional Appeal: How Art Can Inspire Action on Climate Change', Columbia Climate School, April 20, 2021, https://news.climate.columbia.edu/2021/04/20/art-action-climate-change/ Accessed 12 February, 2022.

investigation. From this further research it was found that ‘data mining’ was a valid and topical research idea that could integrate well with the previous set of artworks, and partly be presented as digital artwork, thus using the very medium to expose its unmapped consequences. This became a separate sub-chapter of Chapter 4, Final Outcomes, and is discussed fully therein.

CHAPTER 1: SURVEY OF THE FIELD

Whatever you say it is, it isn't.

Alfred Korzybski

Many different cartographers, geographers and scholars have voiced their opinions on cartography and mapping and most seem to agree that mapping is not an exact science. Maps, like representational art, try to capture the territory, but neither succeed, because both are abstractions. Mapping in the usual sense, one might envisage the use of mapping conventions such as projections, symbols, legends, directional points of reference, grids and titles. However, in the making of the abstract maps for this degree, in most cases, such mapping conventions are quite rare as they are not the primary focus, even though, in some cases, contour lines, roadways, rivers and GPS conventions often appear in the final artworks.

Rather than provide a review of the literature in isolation from the practical context of the field, the following survey of the field will provide insights into the theoretical and practical aspects of the research project in reference to both literature and works of art. The survey will be divided into four parts, firstly engaging with the theoretical underpinning by reviewing several philosophers and theorists and relating these ideas to the non-traditional outcomes of the project, secondly it will review the historical background of map-making and map artists to illustrate the development of mapping and navigation over time, for both the art and the science. In more modern times, it will show the use of maps created within contemporary art. Thirdly, a review of artists in the Anthropocene who have an interest in mapping and whose practice involves abstract geographical map art as their subject matter, alongside an engagement with related artworks in the field, will be undertaken. Finally, the chapter will demonstrate the progress of the research of the selected geographical locations within Australia and the Antarctic leading up to the final stages of production and the exhibition of the artworks produced for this degree.

1.1 The grid system explained

Throughout this exegesis I have referred to many artists using a grid system in premodern and modern times, in particular, works of geometric abstraction, but more importantly, I discuss the use of the grid system in the works of contemporary maps and the works of map artists, where the grid is used to mark latitudinal and longitudinal lines in their artwork. This grid system is usually a measured network of evenly spaced horizontal and vertical lines that reflect the invisible latitudinal and longitudinal lines used to identify locations on a map. In my case, and some of the artists discussed such as Cassini, Imants Tillers, and Derek Lerner, this grid system is used to either infer locations on their 'maps' or to give an aesthetic placement. That is to say, placing those paintings with either spacing between the paintings or abutting them together, depends on which style suits and gives a more aesthetic feel to the display of those works. In the case of 'Awful Beauty' referred to in Section 4.3, each map has been named with the coordinates that reflect their position on the grid system taken from Google Earth but placed in a grid system in no particular order to achieve an aesthetic look and feel of a map, while withdrawing some conventional signifiers that might lead to the conclusion of authenticity and scientific accuracy. Mapping conventions are thus utilised for aesthetic and conceptual ends, as a platform for the ethical and moral concerns addressed in both the traditional and non-traditional forms of research undertaken. A folded 'map-like' catalogue in grid format also accompanies the exhibited works.

1.2 Theoretical underpinnings

The artworks produced for this degree are often informed by the theoretical writing of scholars and philosophers, alongside practice-based research methodology. For example, my early thoughts on how large to create the artwork was defined by the theoretical writings of a variety of scholars and philosophers underpinning the research such as the short story of *Sylvie and Bruno Concluded* by English author/poet Lewis Carroll in 1893. In that story he wrote that the largest map considered really useful would be six inches to the mile; although his country had learned map-making from his fictional host Nation, it had carried it much further, having gone through maps that are six feet to the mile, then six yards to the mile and so on—finally, a mile to the mile. However, the farmers said that if such a map was

to be spread out, it would block out the sun and crops would fail, so the project was abandoned. One of Carroll's characters noted that there were some practicalities with this map, stating 'we now use the country itself as its own map – which is just as good'.[15] This humorous story reminds us of the difficulty of creating a map that can faithfully cover the territory without remainder.

In 1933, the Polish philosopher Alfred Korzybski [16] wrote in *Science and Sanity* that 'the map is not the territory, but if correct it has a similar structure to the territory which accounts for its usefulness'. He used it to convey the fact that people often confuse models of reality with reality itself. According to Korzybski, models stand to represent things, but they are not identical to those things, but require interpretation, and those interpretations are different to another's because of our own, or others', limitations, cultural context, perceptions or points of view. For example, I invited a friend to observe a map. Opening an atlas at random, I asked her what she saw first and foremost. She observed 'a grey landmass', which was the Carpathian Mountains in Romania whereas my first impression of the map was the Mediterranean Islands outlined in red. There was no right or wrong answer, just different perceptions. To add to the perceptions of each of us, was where we viewed the atlas from. She was sitting closer to the 'Romanian' end while I was sitting opposite down the 'Mediterranean' end. Thus, phenomenological conditions such as the body of the viewer, also play a part in our perceptions of things.[17] Not unlike Hans Holbein's use of anamorphosis in *The Ambassadors* (1533), where one perspective gives you the depicted scene – the titular ambassadors – and the other, a human skull. Returning to my story, I would then ask my friend the question – what is more relevant, 'What you see?' or 'Where you view it from?' Advancing that idea, what would be seen from a car driving along a roadway as opposed to doing a 'flyover' in Google Earth, both offering two distinct experiences of the same location which become different perceptions or points of view, which brings us to another short story by Borges.[18]

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[15] L. Carroll, Sylvie and Bruno Concluded (1893), ch.11, p.163, https://etc.usf.edu/lit2go/211/sylvie-and-bruno-concluded/, accessed 22 Apr. 2022.
[16] A. Korzbyski Science and Sanity, 1933.
[17] M. Ponty, The Phenomenology of Perception, Routledge, London, 1962.
[18] S. Gibson, '*Science and Sanity* and Alfred Korzybski' (18 Jul 2018), https://steven-gibson.medium.com/science-and-sanity-and-alfred-korzybski-a25ad01e1bad, accessed 2 April 2022.

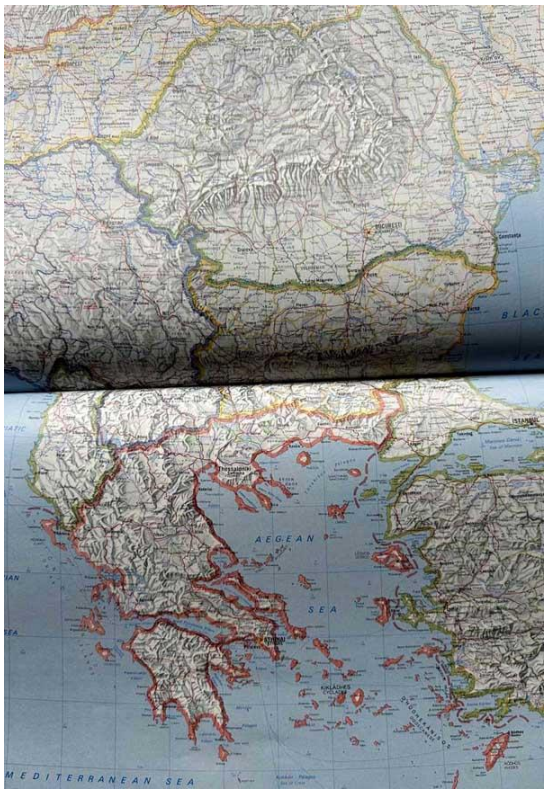

Figure 1: *New Concise Atlas of the Earth*, 1982 Edition, Colporteur Press, Sydney Australia, pp. 124-125.

In *On Exactitude of Science*, 1946, Argentinian writer Jorges Luis Borges, stated

> to represent an irreducibly complex system such as the geography of a country, it must be an abstraction or simplification of the original and that the two extremes in that representation are useless: a reduced representation would be too abstract to adequately describe the system versus a representation that is just as complex as the system itself.

Borges gives the example of an empire that attempted to create a map of everything on Earth, eventually drawing one that covered the Earth's surface completely. Succeeding generations, those less interested in the study of cartography, understood that this extended map, this replica of the empire, was

useless, and without emotion, they abandoned it to the vagaries of the weather, leaving it to eventually rot into the soil it mapped.[19]

German theorist and historian, Bernhard Siegert[20] also refers to the Borges myth by referencing Dutch Baroque period painter, Johannes Vermeer's *The Art of Painting*, 1666-68 (Figure 2) where the map painted on the wall, imitates the canvas on which the original map was painted, complete with folds, lighting and shadows defining the contours of the territory; the map is the territory.

Figure 2: Johannes Vermeer, *The Art of Painting*, (1666-68), https://www.johannesvermeer.org/the-art-of-painting.jsp,

According to Siegert, 'the main feature of the analysis of maps as cultural techniques is that a map is not a "representation of space", but as spaces of representation and that maps contain less information about a territory than about the way it is observed and described'.[21] Others, such as cartographers, have criticised the accuracy or value of maps and the theories that purport to explain their efficacy by pointing out that maps are always a compromise between reality and

[19] Baudrillard,J., *Simulacra and Simulation* (University of Michigan Press, 1994), https://www.google.com.au/books/edition/_/9Z9biHaoLZIC?hl=en&gbpv=1&pg=PA1&dq=Baudrillard,J.,+Simulacra+and+Simulation+university+of+Michigan+Press, accessed 7 Oct. 2021.
[20] B. Siegert, 'The map is the territory', *Radical Philosophy* (Sept. 2011), https://www.radicalphilosophy.com/article/the-map-is-the-territory, accessed 30 Sept. 2021.
[21] B. Siegert, 'The map is the territory', *Radical Philosophy* (Sept. 2011),

error, that map projections clearly illustrate this concept. Flattening the surface of the globe always produces distortions, giving false impressions of reality. The cartographer must make important choices in map design, since not only is the world too full to represent everything, but sometimes important information is not available, or in a timely manner. For example, in the Northern Territory, Australia[22], roads are still shown as having their integrity, undamaged by the floods, but the current state of the damaged roads may be accessible through digital apps. Therefore, the relation between the territory and the map is fluid and open to revision.

Jean Baudrillard[23] engaged with the problematic of the relationship between the real and the hyperreal, drawing on Borges in his involvement with the relation of the map to the territory. The map and the territory are metaphors that illustrate the difference between the actual world or real-life referent and our understanding of our perception or representation of that world. The 'map' is our understanding or view of the 'territory' of reality.[24] In other words, any map is simply a representation of what the map creator thought the land looked like, or indeed wished to create, but the territory is the reality we must deal with. Indeed, British maps and subsequent Australian maps of this continent differ vastly from the First Nations maps that organise the territory into those nations they recognised at the time of colonisation. The 'real' Australia is a contested idea. But what of real-life experience and the map?

An example from 'real' life from my own experience is as follows. While on a nature walk, an orienteer stopped me to ask if I could show her where on her map she actually was. Living in the area it was easy to show her where she was, and how badly the map had been drawn. The map provided checkpoints along the way, some of which were not, in reality, there anymore. The map was not the territory but an abstract interpretation of the location that suited a certain time and objective.

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[22] NOTE: January 2023, Three kilometres of road washed out on the Great Northern Highway.
[23] Baudrillard,J., *Simulacra and Simulation* (University of Michigan Press, 1994), https://www.google.com.au/books/edition/_/9Z9biHaoLZIC?hl=en&gbpv=1&pg=PA1&dq=Baudrillard,J.,+Simulacra+and+Simulation+university+of+Michigan+Press, accessed 7 Oct. 2021.
[24] P.McIntyre, J.Avshalomov, J. Aung & A. Norman, 'What is the Map is not the Territory?' *The Map is Not the Territory, Conceptually*, (n.d.), https://conceptually.org/concepts/the-map-is-not-the-territory#:~:text=The%20map%20and%20territory%20is,map%20is%20not%20the%20territory! accessed, 3 Nov. 2021.

Jean Baudrillard, in his essay *The Precession of Simulacra* 1983, suggests that 'there is no longer a real because signs of the real have replaced the real', and in its place is a hyperreal.'[25] The territory no longer precedes the map, nor does it survive it. It is nevertheless the map that precedes the territory – precession of simulacra – that engenders the territory.[26] Therefore, the key point to be made here is that maps, like representational art, try to capture the territory, but neither succeed, because both are abstractions, and both create the very territory they purport to merely represent. To understand this paradoxical statement, we will turn to Baudrillard again to examine the details of his position. Baudrillard writes that there are four stages of simulacrum; one, it is the reflection of a basic reality, two, it masks and perverts a basic reality, three, it masks the absence of a basic reality and four, it bears no relation to any reality whatever: it is its own pure simulacrum. Baudrillard's concept, applied to this research project can be understood as the two media, art and maps, which share the same function. They both precede the 'territory' they are thought to map or represent. This means there is no obligation to fidelity. But it also means the artist can draw attention to what is not accepted territory or real – what is not explicit in our understanding of site or location – creating a new map/territory that draws attention to the unsightly as much as the site itself.

A visual example demonstrates this theory, by comparing views and impressions of Cadia Mine, the real and the hyperreal. In Figure 3, we see an aerial view of the Cadia Mine in 2010 while in Figure 4 we see the view from Google Earth in 2023. Figure 5, is my abstract version of that mine, which I believe fits within Baudrillard's second stage of simulacrum where it masks and perverts a basic reality.

[25] Baudrillard,J., *Simulacra and Simulation* (University of Michigan Press, 1994), https://www.google.com.au/books/edition/_/9Z9biHaoLZIC?hl=en&gbpv=1&pg=PA1&dq=Baudrillard,J.,+Simulacra+and+Simulation+university+of+Michigan+Press, accessed 7 Oct. 2021.
[26] J. Baudrillard, Simulacra and Simulation (University of Michigan Press, 1994), p1, para 2.

Figure 3: Cadia Mine, 2010, https://www.resourcesregulator.nsw.gov.au/sites/default/files/documents/cadia-east-inrush-report-for-publication.pdf

Figure 4: Cadia Mine, Google Earth: 2022, 33°32’8.37” S 149°04’33.03” E

Figure 5: Loi Magill, *Cadia Mine*, (2022), watercolour and gouache, watercolour paper, 76 x 56 cms

Drawing on those stories of Alfred Korzbyski, Jean Baudrillard and Lewis Carroll convinced me that conceptually, I had to create the 'map' as a large scale because I was beginning to think of the site of installation, as much as the site of the mines. From a discussion with the curator at the University of Southern Queensland, I decided on the size of the intended wall map, which would cover an area of 6 metres wide by 2.4 metres high, consisting of 160 canvas boards, each 30 centimetres square. This would be site-specific to the largest wall in the gallery in A Block at the University of Southern Queensland, creating a confusion or blurring of boundaries between the site or territory, and the map that covered it almost exactly. To a degree, the 'map' or site-specific work, covers, but also reveals the wall, or more precisely, 'creates' the wall – a wall that does more than structurally hold a ceiling, it also reveals a relation between work and site or map and territory.

Other works created use the concept of mapping to serve other aims, beyond drawing attention to locations. Artist Lyle Skains[27] claims 'we create art to connect with others and ourselves and experiment in order to push our boundaries, ask questions and learn more about our art and our role within it'. This statement reflects approaches I have taken in my artworks that concentrate on mapping locations of

[27] R. Lyle Skains, *Creative Practice as Research: Discourse on Methodology, Media Practice and Education* (Taylor and Francis Online) 2018. https://www.tandfonline.com/doi/full/10.1080/14682753.2017.1362175, accessed 18 Apr. 2022

interest that aim to question the detrimental effects on the land so mapped, in particular, the idea of questioning 'facts' associated with, in this case, maps, and our roles as stewards of the environment – how we map it, what we show, and why we show it. To understand how maps 'lie', and how they might be used in contemporary works of art, I undertook research into the historical background of cartography.

Focusing on our Australian environment in particular, non-traditional research produced as 'maps' show the detrimental effects to our environment such as toxic waste dumps from the output from mining operations as well as extensive land clearing for dams, roadways and cities. In an effort to bring these degradations to the attention of viewers, and have them see them from another angle or perspective, I have grounded my research in practice-based research methodology, a topic covered in the next chapter.

1.3 Historical background of mapping and map artists

This section of the survey will elaborate on the historical background of map-making to illustrate the development of such an activity, as art and later in art. The question of whether these works can be considered as art is answered through reference to selected philosophers, theorists, curators and cartographers. The scientific and artistic status of maps has long been argued by American Denis Wood[28] an artist and cartographer, who claimed that 'cartography was dead, not the end of map-making but the end of map-making as an elite preserve of university-educated-cartographers'. Wood is inferring that the maps produced by cartographers were compiled to a strict set of rules and regulations, and only the preserve of qualified cartographers, whereas maps could be produced by others, such as artists and others with an interest in conveying information via maps, about anything, for example, where fires have been and may occur in the future, the spread of diseases and so on. However, mapping has a long history.

Between sixty and eighty thousand years ago, First Nations people were using 'marks' on bark, message sticks and marking in the sand to indicate the

[28] D. Wood, 'Map Art', Cartographic Perspectives (1 Mar. 2006), DOI: *https://doi.org/10.14714/CP53.358,* accessed 25 Jul. 2021.

position of water holes and meeting places[29]. Their oral culture told of paths across the country, drawn in the sand as maps in forms that are both artistic and scientific. This oral culture later became known as their song lines, or dreaming tracks, that 'map' paths, as shown in Billy Patch's sand drawing, (Figure 6). Song lines trace astronomical and geographical elements in ancient stories that have helped shape the landscape to what it is today and were first used as a form of communication across areas of Australia.[30] According to Reed Enger, First Nations artists are 'mapping the Dreaming'[31] and in his paper, Indigenous artist, Jeannie Herbert Nungarrayi, a Walpiri teacher says

> [The Dreaming] is an all-embracing concept that provides rules for living, a moral code, as well as rules for interacting with the natural environment. The philosophy behind it is holistic – the Jukurrpa provides for a total, integrated way of life. It is important to understand that, for Warlpiri and other Aboriginal people living in remote Aboriginal settlements, The Dreaming isn't something that has been consigned to the past but is a lived daily reality.[32]

[29] Artlandish, 'Aboriginal Art Culture', 2024, https://www.aboriginal-art-australia.com/aboriginal-art-library/the-story-of-aboriginal-art/
[30] R. Glynn-McDonald, 'Songlines', *Common Ground* (25 Oct. 2022), https://www.commonground.org.au/article/songlines#:~:text=Songlines%20trace%20astronomy%20and%20geographical,a%20way%20of%20mapping%20Country, accessed 3 Mar 2023
[31] R. Enger, 'Contemporary Indigenous Australian Art, Mapping the Dreaming, in *Obelish Art History, Jan, 2020* https://www.arthistoryproject.com/timeline/contemporary-art/contemporary-indigenous-australian-art/ Accessed, 23/01/24.
[32] R. Enger, 'Contemporary Indigenous Australian Art, Mapping the Dreaming, in *Obelish Art History, Jan, 2020* https://www.arthistoryproject.com/timeline/contemporary-art/contemporary-indigenous-australian-art/ R. Glynn-McDonald, 'Songlines', *Common Ground* (25 Oct. 2022), https://www.commonground.org.au/article/songlines#:~:text=Songlines%20trace%20astronomy%20and%20geographical,a%20way%20of%20mapping%20Country, accessed 3 Mar 2023
[32] R. Enger, 'Contemporary Indigenous Australian Art, Mapping the Dreaming, in *Obelish Art History, Jan, 2020* https://www.arthistoryproject.com/timeline/contemporary-art/contemporary-indigenous-australian-art/ Accessed, 23/01/24.
[32] R. Enger, 'Contemporary Indigenous Australian Art, Mapping the Dreaming, in *Obelish Art History, Jan, 2020* https://www.arthistoryproject.com/timeline/contemporary-art/contemporary-indigenous-australian-art/Accessed, 23/01/24 /

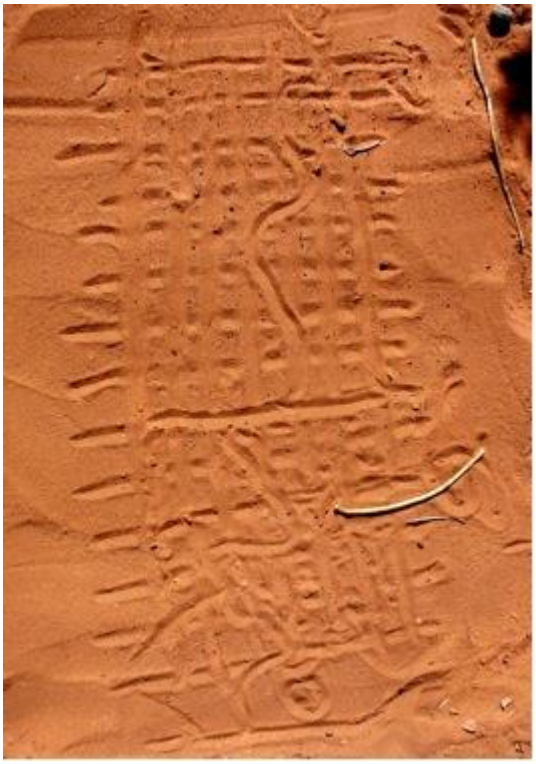


Figure 6: Martu elder Billy Patch's sand drawing of the songlines and sites interrupted by the Canning Stock Route, 2008. (Photograph: John Carty, 2008), courtesy of Australian Research Council Canning Stock Route

Another example of map-making is the 2000 BCE map rock carving from Bedolina at Capo di Ponte in Val Camonica, Lombardy in Italy (Figure 7). Discovered in 1964, the 'map' depicts various topographic patterns as well as images of warriors, animals and wooden huts. Analysis of the map revealed that the drawings were made over time by different artists and included different elements. These circumstances make interpretation very difficult. In 2000 BCE it could have been the artist's exact interpretation of the view from the cave of the village below, or perhaps they were representations of fields and crops conveying a more abstract meaning such as agricultural fertility or the security of the property.[33] Or could this be a modern interpretation looking for abstract meanings in art, when in fact they may have just been pictorial scenes of the time? We may never know – however we do know that some later maps were used for trade and colonisation and incorporated simple navigational tools and identification/memory prompts.

[33] C.D. Smith, 'The Emergence of Maps: in European Rock Art: A Prehistoric Preoccupation with Place', *Imago Mundi Ltd*, 34:1, 9-25 https://doi/abs/10.1080/03085698208592537 5

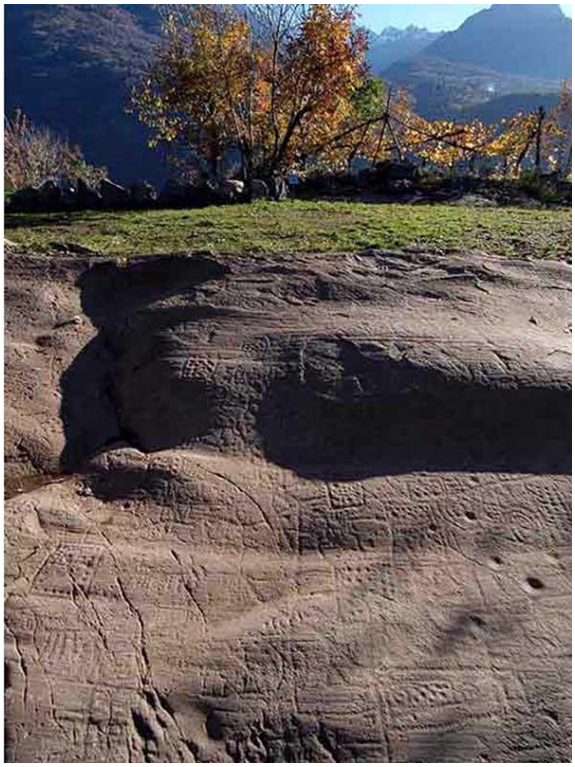


Figure 7: Bedolina map, Capo di Ponte, Italy, 1000-200 BC
http://www.dianesavonaart.com/blog/2020/4/23/maps-in-stone-amp-clay

Over centuries, artists have engaged with the topic of maps and cartography, deploying a variety of artistic methods to illustrate those maps, sometimes with fictitious sea monsters warning sailors about the unknown. The Venetian monk Fra Mauro preferred to rely on traveller's tales of their explorations and record these as accurately as possible on his now famous world map *Mappamundi*. Comparing it to the *Blue Marble*, Landsat's satellite view of Earth (Figure 8), it was considered so accurate that it was only 'out' by a few miles in its measurements.

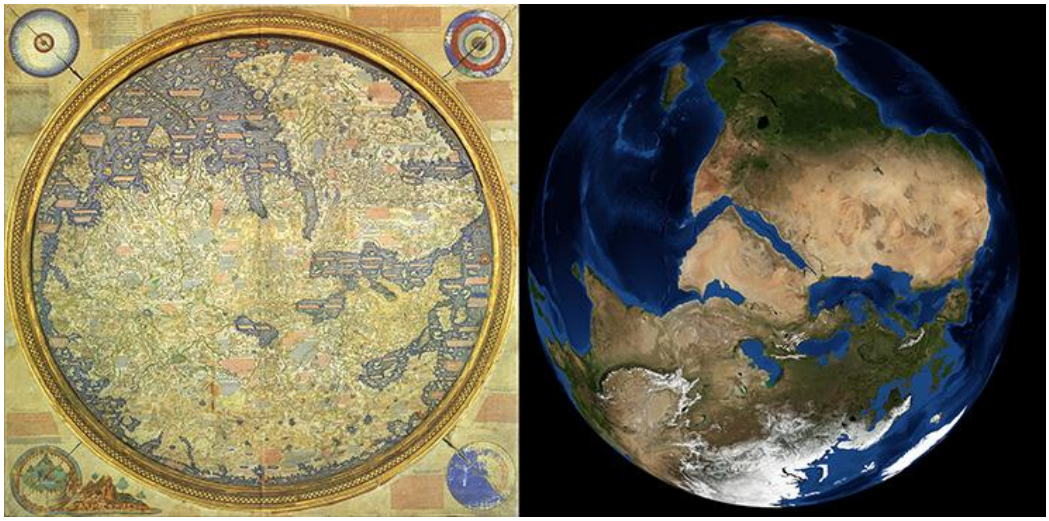


Figure 8: Fra Mauro, *Mappamundi* (1450) *and* Landsat's *Blue Marble* (1972), https://landsat.gsfc.nasa.gov/article/fra-mauros-mappamundi/

During the fifteenth century, the *Portolan chart* of North and South America, Europe, Africa and the Arabian Peninsula (Figure 9) usually drawn on vellum and sometimes embellished with a frame and other decorations, contained lines that pilots used to lay courses from one harbour to another, listing directions and distances. However, Portolan charts did not consider the curvature of the Earth, therefore as navigational tools for crossing the open ocean, they were useless. Portolans were later replaced by Mercator projection charts, but even so, they do not show true distances or sizes of continents near the north and south poles.

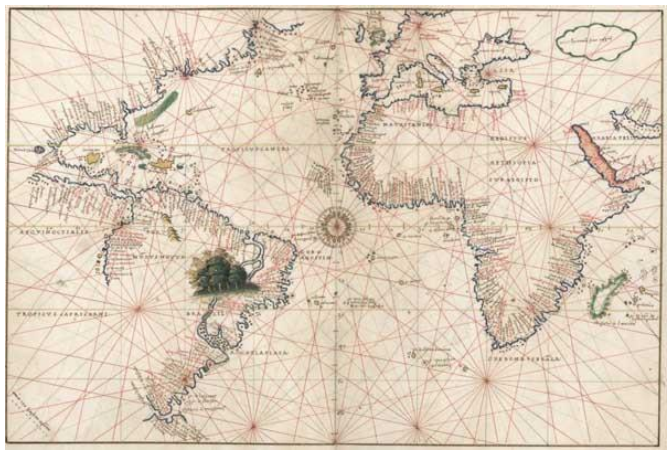


Figure 9: Chart of North and South America, Europe, Africa, and the Arabian Peninsula from World map. Dedicated to Hieronymus Ruffault, Abbot of St. Vaast. [1544]. Library of Congress, Geography and Map Division. Vellum 5.

To overcome this limitation and to enable navigation to those parts of the world not yet ‘discovered’, by colonists at least, more exact navigational maps were needed. Even so, the discovery of an accurate and reliable method of determining longitude took four centuries of study. Eighteenth century English carpenter and self-taught clockmaker, John Harrison’s chronometers, later named H-1 through H-4, used innovative concepts like suspended mechanisms whose motion was not influenced by gravity or the motion of a ship which enabled sailors to locate themselves and navigate safely and efficiently to their destination. Without this and other innovations in pre-modern navigation, we would have been lost. Such navigational maps were as accurate as could be at the time, but nowadays, modern maps are updated on a weekly basis through digital downloads, providing other important information such as shipping obstacles, sand banks and so forth.

Constellation inclusions to maps (Figure 10) have always been seen as having practical value for navigation; however, map makers also added decorations such as pictures of birds, ship, animals and sailors to their work, adding art to the science.

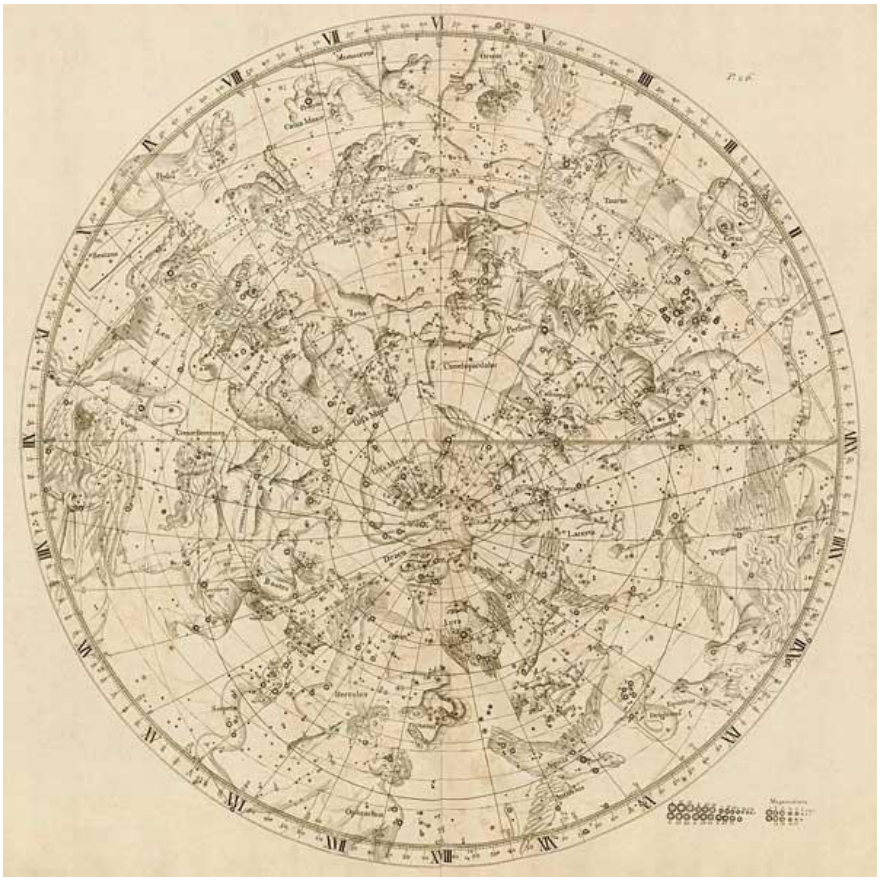


Figure 10: John Flamsteed, Antique Constellation Map – Northern Hemisphere, (1729), https://fineartamerica.com/featured/antique-constellation-map-northern-hemisphere-by-john-flamsteed-1729-blue-monocle.html?product=poster

This is also demonstrated in *The Carta Marina* (Figure 11 and Figure 12). Perhaps these decorations encouraged people to acquire these maps, thus promoting the map maker as both a cartographer and artist.

Figure 11: Olaus Magnus, *The Carta Marina*,(1539), https://www.researchgate.net/figure/Olaus-Magnus-Carta-Marina-detail-Printed-in-Venice-1539-The-sea-monsters_fig5_337950229

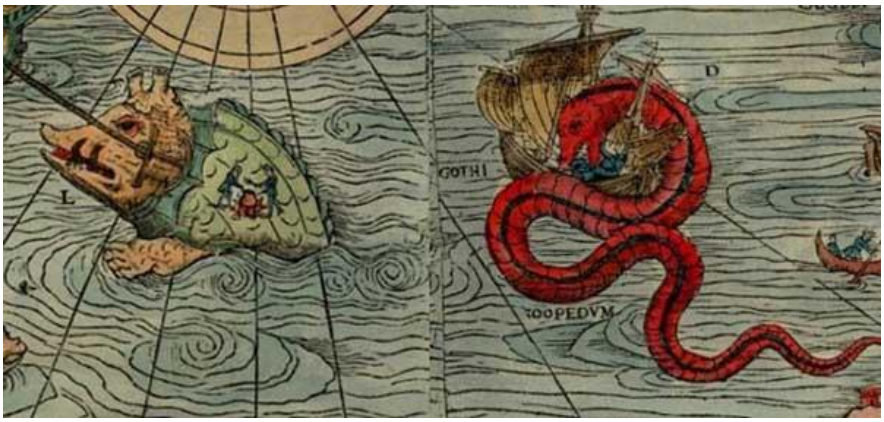


Figure 12: The artistry and imagination of the Carta Marina (detail above)

From these early works it is difficult to distinguish between a map as a scientific guide and an artistic representation, since, like paintings of landscapes, they represent, however abstractly, the landscape, and of course the oceans. Map-making and landscape painting were considered similar activities and were connected because of the common conceptions of the earth and the ability to

represent the selected subjects on a plane surface. In addition, common links were found between the cosmic and the terrestrial, in that maps and paintings both reflected the current ideas of space and the cosmos.[34] Research shows that as far back as 320 BCE with the application of Euclidian geometry, cartography emerged as a distinctive practical field.[35] This led to improvements in map accuracy, but nonetheless, issues persisted, most obviously the depiction of the relative size of countries.

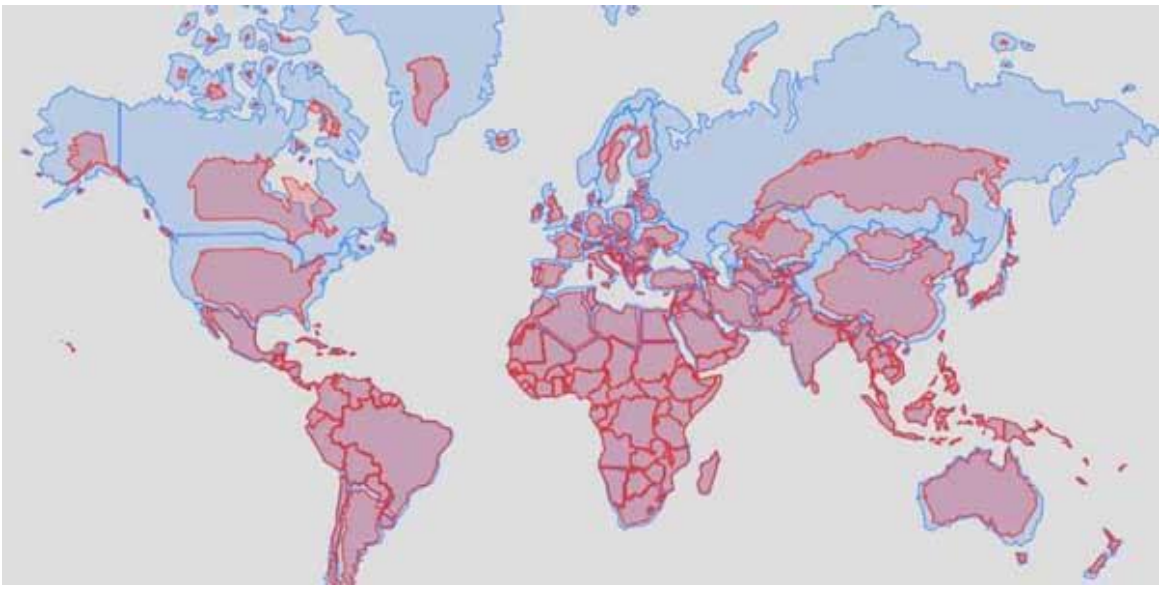


Figure 13: Real country sizes shown in red on Mercator Projection
https://engaging-data.com/country-sizes-mercator/

The blue section of the Mercator map shows the distorted size of countries while the true size of those countries is overlayed in red (Figure 13). Navigational aids developed over time and when, in 1884 longitudinal lines were fixed at Greenwich, map-making became more of a mathematical undertaking than as a scientific enterprise and accuracy improved as a result.

Ancient maps have been found in Mesopotamia, in 3500 BCE and Europe, such as the Bronze-age 'Saint Belec Slab', although France, 1793, was the first

[34] R. Rees, 'Historical Links between Cartography and Art', *Geographical Review*, 70,1, 60-78 (Jan. 1980), https://www-jstor-org.ezproxy.usq.edu.au/stable/pdf/214368.pdf?refreqid=excelsior%3Ad4dd498e2803457251228814fb16d578&ab_segments=&origin=&initiator=&acceptTC=1, accessed 23 Nov. 2021.
[35] G.M. Lewis, 'The Origins of Cartography', *History of Cartography*, (1987), https://press.uchicago.edu/books/HOC/HOC_V1/HOC_VOLUME1_chapter3.pdf

country to have a complete set of geographical maps. Four generations of the Cassini family, the first being César François Cassini, was third in a line of four astronomers, and was born at the Observatory of Paris in 1714, where his father and grandfather had worked before him. The map of France was commissioned by King Louis XV who ordered that a topographical map of all of France be created, showing every city, commune, village and hamlet of the country, including rivers, lakes and a perfect rendition of the coastline.[36] The map (Figure 14) was completed 50 years later by his son Jean-Dominique Cassini (Cassini IV) and finally published in 1793.

Figure 14: Cassini Family, *Map of France*, (1793), 182 sheets, maps; 22 x 35 in., mounted on linen & dissected to fold in 30 boxes, 24 cm. + 2 sheet index in box no. 1., in slip case[37]. https://www.geoportail.gouv.fr/donnees/carte-de-cassini

[36] A. Morddel, 'The Cassini Map', *The French Genealogy Blog* (21 Jun. 2009), https://French.genealogy.typepad.com/genealogie/2009/06/the-cassini-map.html, accessed 9 Sept. 2021.
[37] NOTE: This information was obtained from the New York Public Library via email dated 30 March 2023.

Figure 15: Detail of the Cassini map showing Paris section, 1793, https://www.geoportail.gouv.fr/donnees/carte-de-cassini

This physical map, 39 feet high by 38 feet wide, is made up of 182 sheets pf paper and drawn to a scale of 1:86,400, and originally engraved on plates for future printing.[38] Hachure and shading are used to define the topography shadows emphasising elements such as deep green forested areas. It is rich in historical and cultural information and elegant graphic art. It was the first national survey that relied on the latest science of the times[39]. One of Cassini's aims was to represent that which is unchangeable in the landscape. Since the Industrial Revolution was only in its infancy, he could not have foreseen the changes to the landscape that this would bring about the very changes the non-traditional research of the present project aims to capture through visual works.

An example of such changes, where the courses of most European rivers have experienced significant irreversible changes, such as the Danube River (Figure 16) which meanders through Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Bulgaria, Romania, Moldova, and Ukraine eventually flowing into the Black Sea. Over the last 300 years this river has undergone many changes which have included

[38] V. Baena, 'Revolutionary Cartography and the Cassini Map of France', *New York Public Library* (18 Nov 2022), https://www.nypl.org/blog/2022/10/18/revolutionary-cartography-and-cassini-map-france, accessed 10 Dec 2022.
[39] David Rumsey Map Collection, 'Composite: Carte de France, (Cassini, Cesar-Francois, 1714-1784); (Cassini family), 1750', *David Rumsey Map Collection* (2003). https://www.davidrumsey.com/xmaps10000.html, accessed 2 Aug. 2021.

modifications such as local bank protection measures, dike systems for flood protection and flood protection levees[40]

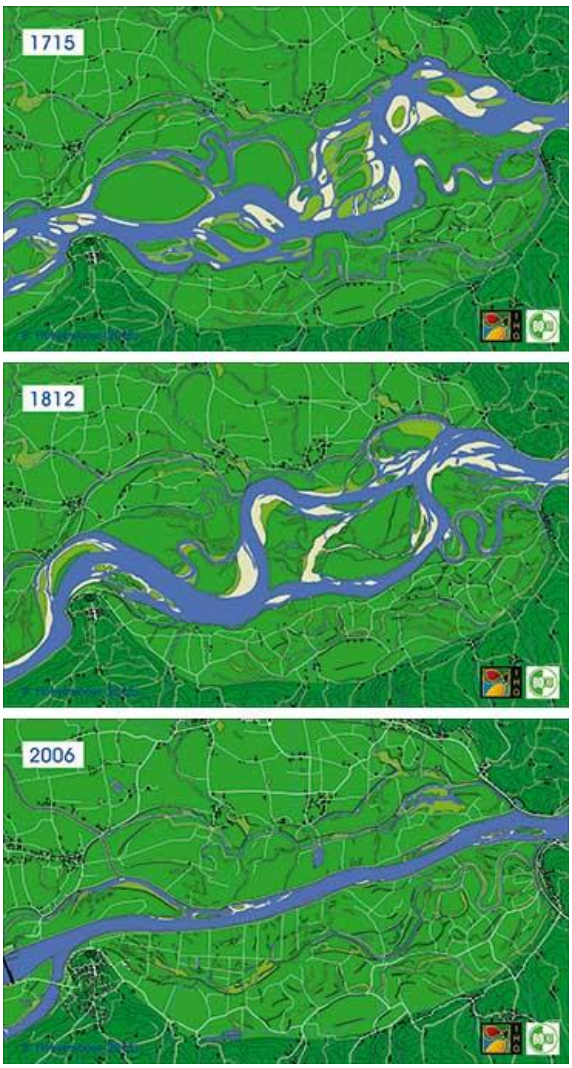


Figure 16: Channel changes of the Danube River in the Austrian Machland floodplain from (1715 to 2006). Credit: FWF project Machland 1715-1991, Nr. P14959-B06. https://www.icpdr.org/main/publications/historical-patterns-along-danubes-course

Another example is the Snowy River scheme, an iconic river in south-eastern Australia. It rises near Mount Kosciuszko and, up until the construction of the Snowy Mountains Hydro-electric Scheme, it was the largest snowmelt river in Australia, renowned for its Spring flows, particularly in periods of flood. This scheme was built over a 25-year period from 1949 to 1974 and resulted in the diversion of 99% of the

40 S.Hohensinner, 'Historical patterns along the Danube's course', ICDPR (Feb 2015),https://www.icpdr.org/main/publications/historical-patterns-along-danubes-course, accessed 4 Nov. 2022.

Snowy River's mean natural flow at Jindabyne. It collects and stores water from the head waters of the Snowy River and diverts it westward through trans-mountain tunnels and power stations to the Murray and Murrumbidgee Valleys.[41] The scheme has nine power stations, 16 major dams, 80 kilometres of aqueducts and 145 kilometres of interconnected tunnels (Figure 17).

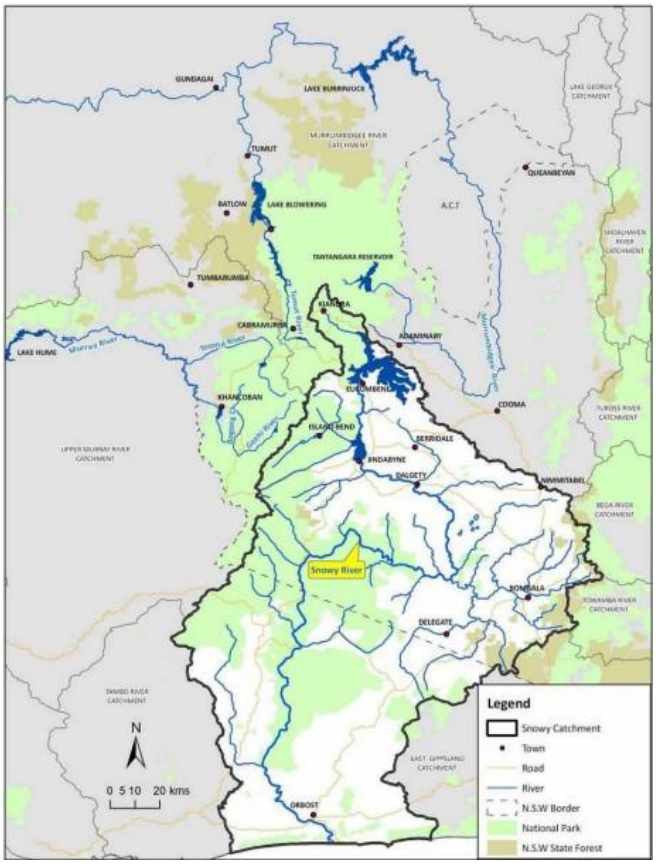


Figure 17: Snowy Mountain Rivers and catchment area, (2010). https://www.industry.nsw.gov.au/__data/assets/pdf_file/0006/143619/Returning-environmental-flows-to-the-Snowy-River.pdf

Each year, roads are re-routed, speed limits are updated, new businesses start up and others close down, new streets appear, some are renamed. Reality is a roller coaster, and the challenge for mapmakers is to keep up with the constant changes. In order to deliver maps that reflect reality as accurately as possible, these

[41] NSW Government, 'Returning environmental flows to the Snowy River', *Office of Water* (Feb 2010), https://www.industry.nsw.gov.au/__data/assets/pdf_file/0006/143619/Returning-environmental-flows-to-the-Snowy-River.pdf, accessed 5 Mar. 2023.

changes need to be quickly processed[42] (Figure 18). GPS systems such as Garmin and Navman are regularly updated to track these changes. Google Maps and Waze apps offer even more current information about traffic conditions with real time updates, all of which require vast amounts of energy, a topic covered later in Chapter 4. Another point to be drawn from the above discussion is the idea that maps 'lie', or that their ability to accurately and objectively present the real-life referent is compromised by the limitations of historical and conventional mapping techniques. Contemporary maps, and of course map artists, can use this limitation to produce creative responses to cultural topics without limitations imposed by assumptions of verisimilitude.

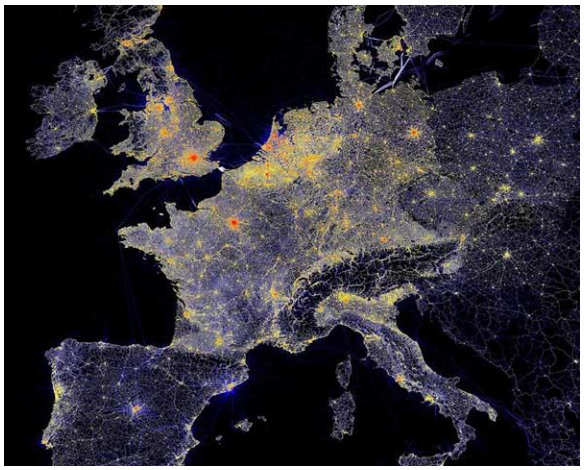


Figure 18: 61 billion GPS data points collected each day
https://www.tomtom.com/newsroom/behind-the-map/continuous-map-processing/

A collaborative map, also known as citizen mapping and generated by many users in a digital format, was created by Erica Fischer's *Geotagged map of Sydney* 2010 (Figure 19) which traces geo-tagged photos: the process of adding geographical identification metadata to various media such as photographs, videos or websites from the platforms Flickr and Picasa, which document a city from either the locals' or the tourists' perspectives. The distinction between tourists and locals is made by the speed at which the photographers travelled (by analysing the timestamps and geo-tags of the photos). The blue dots on the map represent locals

[42] A. Marchant, 'Behind the Map: How we keep our maps up to date', *TomTom* (22 Oct. 2019), https://www.tomtom.com/newsroom/behind-the-map/continuous-map-processing/, accessed 20 Aug. 2022.

(users taking pictures in the same city for over a month), the red dots represent tourists (users taking pictures for a period that is less than one month) and the yellow ones remain uncategorised.

Figure 19: Erica Fisher, *Geo-tagged map of Sydney*, (2010)
https://www.flickr.com/photos/walkingsf/4672149966/in/album-72157624209158632/

Of particular interest is American J. B. Harley[43], who argued 'that we should encourage an epistemological shift in the way we interpret the nature of cartography, meaning that we might accept what cartographers tell us maps are supposed to be, but that historians of cartography accept uncritically the broad consensus of what cartographers tell us maps are supposed to be. Harley also wanted to adopt a strategy aimed at bringing deconstruction of the map into sharper focus, by reading between the lines of the map, which may help discover what might not be in the map or what might be contradicted in the map. The cartographic facts that the map is made of, might only be facts within a specific cultural perspective, and are in fact only one way of looking at the world. For example, Social-geographer Danny Dorling presents in *TedTalk*[44], (2017), an example of deconstructing a map by cartographer

[43] J.B.Harley, 'Deconstructing the map', *Cartographica*. 26, 2, (1992), 1-20. https://quod.lib.umich.edu/p/passages/4761530.0003.008/--deconstructing-the-map?rgn=main;view=fulltext, accessed 24 Jul. 2021.
[44] D. Dorling, 'Imagining the world anew - redrawing the world map', [video] (17 May 2016), TEDxExeter, https://www.youtube.com/watch?v=Ttshw4mELNk, accessed 28 Mar. 2023.

Benjamin Hennig. Reading between the lines, Dorling's explanation of *Hennig's* map, (Figure 20) is that the land area is proportional to human occupancy, and by removing the oceans from the map, we still have nearly 8 billion people, but even so, his positive view is that we are living in a new world, an ageing world, a stabilising world, a world of rapid technological progress which he believes is declining. Infant mortality is reducing, more people are being educated, the population is declining and the world is more connected. However positive he may be, there seems to be a gap in that positivity and what is happening to the planet due to deforestation, mining and other problems mentioned previously which impact both the planet and humanity.

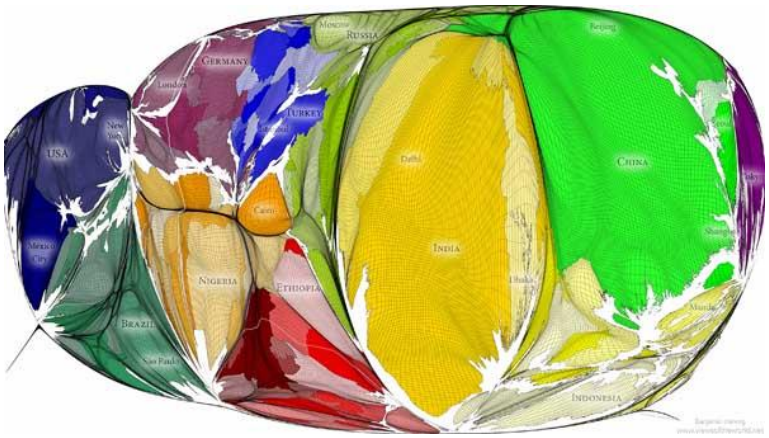


Figure 20: Benjamin Hennig, *Map showing not where we are but who we are*. https://www.ted.com/talks/danny_dorling_maps_that_show_us_who_we_are_not_just_where_we_are

By using conceptual strategies such as the Derridean concept of metaphor and rhetoric[45], according to Dorling, the textuality of and rhetorical dimension of maps could be examined. By so doing, these hidden meanings and metaphors enable a larger and deeper understanding and interpretation of the mapmaker's art, whereas before there were only measurements and topography. [46] These new discoveries and interpretations empower the map reader with new knowledge. For example, as discussed earlier in Section 1.2, 'the map is not the territory' – the

[45] NOTE: Metaphor in maps could mean the complexity of the map will have different meanings to different people, and the rhetoric is the persuasiveness of the map in itself.
[46] J.B.Harley, 'Deconstructing the map', *Cartographica*. 26, 2, (1992), 1-20. https://quod.lib.umich.edu/p/passages/4761530.0003.008/--deconstructing-the-map?rgn=main;view=fulltext, accessed 24 Jul. 2021.

phrase coined by Polish philosopher Alfred Korzybski – where he used it to convey the fact that people often confuse models of reality with reality itself. According to Korzybski, models stand to represent things, but they are not identical to those things.

Harley draws on French philosopher Michel Foucault, whose theories primarily addressed the relationship between power and knowledge[47] – rules to do with cartography, the first being defined in terms of scientific knowledge and the second are the rules governed by the cultural production of the map. For example, there is a large gap between the map of Australia we are familiar with and The AIATSIS Map of Australia, (Figure 21), showing the First Nations locations and language groups prior to colonisation. The two maps are two 'ways of seeing' the same territory – one from a traditional custodian's point of view and the other from a post-colonial perspective.

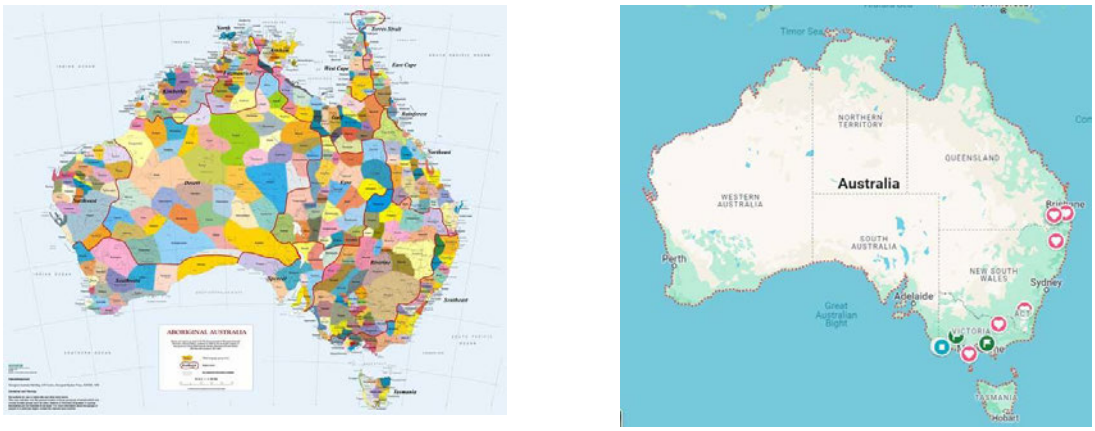
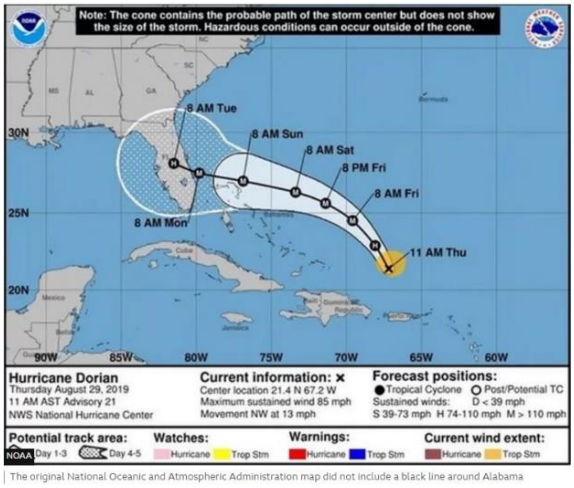


Figure 21: Comparison of map of First Nations Australia to that of colonised Australia

It seems then, that most deconstructed maps in art are made according to the principles of the mapmaker, revealing not only the places or abstract territories but also including the ideas and concerns that the mapmaker attaches to that map. For example, an artist might portray only that which is of interest, or to manipulate a view, such as encouraging voting in a particular way, show land clearing or highlighting political agendas, whereas a traditional mapmaker will adhere to the set principles of map-making. An example of map manipulation was by American ex-

[47] J.B.Harley, 'Deconstructing the map', *Cartographica*. 26, 2, (1992), 3.

President Donald Trump, who distorted the weather bureau's map of the approaching hurricane *Dorian, 2019*, (Figure 22). His strategy was to sway his constituents in the state of Alabama by altering the 'anticipated path' of the hurricane to solicit votes (Figure 23). Whether this had a direct effect is unknown, but Alabama voted for Trump, nine to zero against Joe Biden.[48]



The original National Oceanic and Atmospheric Administration map did not include a black line around Alabama

Figure 22: The original National Oceanic and Atmospheric Administration map did not include a black line around Alabama
https://www.bbc.com/news/world-us-canada-49587232

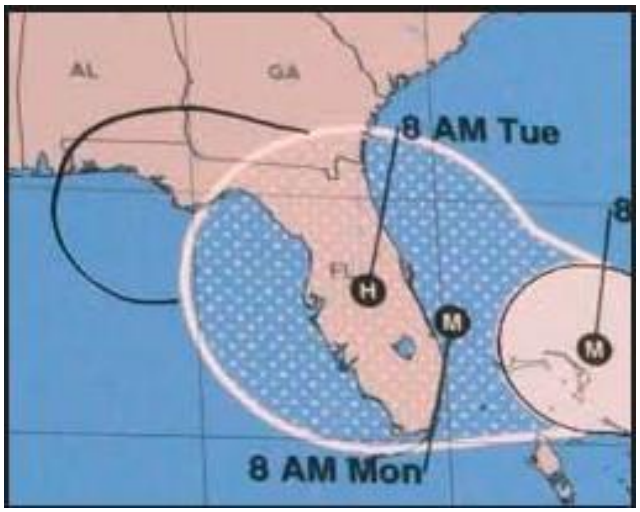


Figure 23: Trump's 'altered path' of Dorian headed towards Alabama.
https://www.bbc.com/news/world-us-canada-49587232

[48] L. Bliss, 'How to Detect the Distortions of Maps', *Bloomberg: City Lab Design* (28 May 2020), https://www.bloomberg.com/news/articles/2020-05-28/how-to-deconstruct-and-interpret-maps, accessed 19 Dec. 2021.

When taking a closer look at Trump's alteration of the map, the hand-drawn curved line in black, on the left side of the image in Figure 23 demonstrates that mapping conventions are not adhered to, since that black line does not touch the coastline. That line is used to emphasise the coast of Alabama, as a means of emotionally coercing those residents to vote for him – a manipulation of facts as an abstraction of reality.

1.4 Contemporary mapping artists

This sub-section references certain contemporary mapping artists whose interests range from mapping the canvas surface, or internal interests, to external issues beyond the canvas such as the environment and the damage caused by human intervention.

Critical geographer Jeremy Crampton[49] has written widely on critical geographies of surveillance, spatial big data and algorithmic decision. He theorises about maps as being 'performative, participatory and political' where interest in performativity has shifted from the map as object to mapping as practice. An example is where Argentinian-Italian artist Luciano Fontana, *Spatial Concept*, 1958, (Figure 24), makes the point that the canvas becomes the 'plane of representation', becoming a 'performance', with the 'map' of the performance found in the resultant marks and cuts in the canvas.

[49] J. Crampton, 'Cartography: performative, participatory, political'. *Department of Geosciences, Georgia State University* (2009) Progress in Human Geography,33 (6) pp.840-848 http://www.sagepub.co.uk/journalsPermissions.nav, accessed 20 Aug 2021.Critical geography is based upon the notion that humanity has the potential to transform the environment.

Figure 24: Luciano Fontana, *Spatial Concept (Concetto Spaziale*), (1958) https://www.metmuseum.org/art/collection/search/769159

The painting by US artist, Joan Mitchell, *City Landscape*,1955, (Figure 25), points to the lack of distinction she saw between urban and natural environments. Natural landscapes and cityscapes were deeply intertwined in her experiences of the world, and she saw them both as ripe territory for painting. She claimed that 'I paint from remembered landscapes that I carry with me—and remembered feelings of them, which of course become transformed.'[50] Mitchell's approach in her combined cityscapes and landscape paintings seem to emphasise the fact that maps as artworks, which were once landscapes of beauty in the romantic and modern periods, are now, in some cases, landscapes of what I am calling 'Awful Beauty'. That is, they are sites that are aesthetically beautiful due to the colours and forms they have, but nonetheless are comprised of toxic chemicals and other waste materials that we don't usually associate with beauty – certainly not beauty found in traditional landscape painting. Mitchell's painting seems to suggest the city's beauty is compromised by waste with the paint tracing formless areas using clashing colours.

[50] SFMOMA, 'Quick Looks: 8 Vibrant Paintings, in Joan Mitchell', *A Creative Force* (2021), https://www.sfmoma.org/read/8-joan-mitchell-paintings/, accessed 8 Sept. 2022.

Figure 25: Joan Mitchell, *City Landscape*, (1955), The Art Institute of Chicago, gift of Society for Contemporary American Art; © Estate of Joan Mitchell https://www.sfmoma.org/read/8-joan-mitchell-paintings/

This waste and environmental destruction leaves behind it a kind of monument to our hubris, when arguably we should leave monuments to good stewardship of the land, as First Nations peoples have done. American artist, Alan Sonfist made this important point:[51]

> Public monuments traditionally have celebrated events in human history – acts of heroism important to the human community. Increasingly, as we come to understand our dependence on nature, the concept of community expands to include non-human elements. Civic monuments, then, should honour and celebrate the life and acts of the total community, the human ecosystem, including natural phenomena. Especially within the city, public monuments should recapture and revitalise the history of the natural environment at that location. As in war monuments, that record of life and death of soldiers, the life and death of natural phenomena such as rivers, springs, and natural outcroppings needs to be remembered.

[51] A. Sonfist, 'Alan Sonfist', https://www.alansonfiststudio.com/, accessed 21 Mar 2024.

Sonfist's work stresses the generative and restorative aspects of the landscape, relying on his own research of a given area and on the advice of regional experts and First Nations custodians which signal his interest in the specific histories of the sites he chooses for his projects, in particular, his use of Indigenous species of plants that predate colonial settlement. By layering these histories, he presents a complex vision of the past, present, and future of the fragile and ever-changing ecosystems that humans share with the rest of the natural world. In contrast to the industrial land art of American artist, Donald Judd, *Untitled*, 1984 (Figure 29), and the more 'macho' efforts of American artist, Michael Heizer's, *City, 1988* (Figure 30), Sonfist's efforts over decades and through multiple movements, represent an important bridge between the early stirrings of ecological awareness in the 1960s and our much more urgent understanding of climate change today.

Sonfist[52] created his *Time Landscape*, 1978, (Figures 26 & 27) to memorialise the ecological loss of the precolonial terrain of New York City. The artwork consists of plants that were native to the New York City in those times. These native plants were replanted again in 1978 on a rectangular plot located in lower Manhattan at the northeast corner of La Guardia Place and West Houston Street.

[52] A. Meier, 'The Origins of Manhattan's Tiny Plot of Precolonial Terrain', *The Wall Street Journal*, (2 Sept 2016), https://www.wsj.com/articles/nature-runs-wild-in-greenwich-village-1441188001, accessed 29 Mar 2023.

Figure 26: Alan Sonfist, *Time Landscape*, (1978), design for a landscape recreated to resemble pristine West Village terrain before the 17th century.

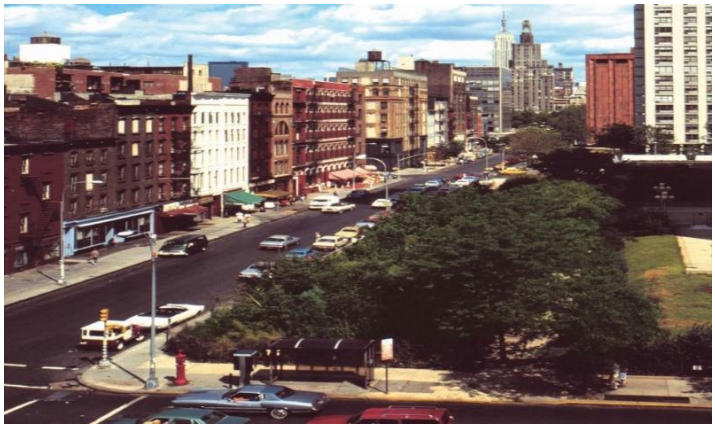


Figure 27: Alan Sonfist, *Time Landscape*, (1978), current, landscape recreated to resemble pristine West Village terrain before the 17th century.

As an artist he has consistently embraced new ideas, new materials, and new processes, as can be seen by the Earth painting, *American Earth Landscape*, 2019-2021 (Figure 28) which is one way of responding to his own suggestion from the quote above: ‘the life and death of natural phenomena such as rivers, springs, and natural outcroppings needs to be remembered’. These works are monuments to cultural and habitat loss and serve as attempts to restore that loss, as opposed to

Judd’s work, *Untitled* (Figure 29) that interrupts the landscape with industrial objects, or Heizer's, *City*, (Figure 30), who reconstructed the landscape to create a kind of futurist industrial city scape.

Figure 28: Alan Sonfist, *American Earth Landscape*, (2019–21), earth on canvas, 10 × 15'

Figure 29: Donald Judd, *Untitled*, 1984, concrete with steel reinforcements

Figure 30: Michael Heizer, *City,* 1988, Nevada Desert

As well as cartographers Denis Wood and J.B. Harley mentioned earlier, John Krygier[53] with research interests in cartography, GIS, and environmental geography, believed there should be two definitions of cartography; one for the professional cartographers where 'cartography is the science and technology of analysing and interpreting geographic relationships and communicating the results by means of maps.' The second, for the public, where the person in the street might consider that cartography is the art, science and technology of making maps. These lines of thinking have freed map-making from being solely the domain of science. As such it is using mapping in new and unconventional ways, by reconceptualising or deconstructing them, and artists can create new geographic domains, and cover non-conventional topics, such as toxic tailing ponds, covered in the present project for this DCA.

Many examples of this idea can be found in Katharine Harmon's book *The Map as Art.* 2009, mentioned earlier, where she has collected over three hundred and sixty map artists who have used materials such as paint, salt, souvenir tea towels, or their own bodies, to explore a world free of geographical constraints to create new domains. In her book she quotes Baudrillard, 'The territory no longer precedes the map, nor survives it. Henceforth, it is the map that precedes the territory'.[54] While this idea is not pursued in her book, I have deployed Baudrillard's idea as one of the theoretical foundations for this exegesis.

[53] J.B. Krygier, 'Cartography as an Art and a Science?' *The Cartographic Journal*, 32:6 (June 1995), 3-10, https://krygier.owu.edu/krygier_html/art_sci2.html, accessed 9 Sept. 2021.
[54] K. Harmon, *The Map As Art, (*New York, Princeton Architectural Press, 2009).

One such example discussed by Harmon is the artwork by Ingrid Calame, *#198 Drawing (Tracing up to Los Angeles River)*, 2005-2011, (Figure 31) who has created her own map of the surrounds of the LA River. By laying tracing Mylar on the ground, she traces the 'ground', and back in the studio, she layers those tracings over each other, creating new maps in the form of indexical traces of site, stating, 'she finds she is building new places – in colour'.[55]

Figure 31: Ingrid Calame, *#198 Drawing (Tracing up to Los Angeles River)*, (2005-2011), colour pencil on trace Mylar, 86 x 127 cm

Another artist dealing with mapping is Ghanian contemporary artist El Anatsui, well-known for his large-scale sculptures that are composed of thousands of folded and crumpled pieces of metal and bottle-tops sourced from local recycling stations and bound together with copper wire. His intricate works are both luminous and weighty, meticulously fabricated yet malleable. His use of these materials reflects his interest in reuse and transformation, drawing connections between consumption, waste, and the environment. This large-scale *New World Map*, 2009, (Figure 32), suggests a large land mass surrounded by a sea of shimmering gold, with a singular longitudinal line on the left, the pattern of the metal, suggesting the latitudinal and longitudinal lines of a map, the metallic weight of the work representing the shifting shapes of the world as we know it. My interpretation on viewing El Anatsui's sculptures seem to take on different forms each time they are hung, the different

[55] I. Calame, 'Ingrid Calame in her Studio' [video], Vimeo, (2007), http://www.ingridcalame.net/videos-on-process/2016/5/6/ingrid-calame-in-her-studio-2007-2, accessed 3 June 2022.

drapes and folds could suggest the landforms changing over time – that the landscape is a negotiable and changing site.

Figure 32: El Anatsui*, New World Map*, (2009),
aluminium bottle caps and copper wire, 500 x 340 cms

The Ethiopian American contemporary visual artist, Julie Mehretu, is known for her large-scale multi-layered paintings of abstracted landscapes using a variety of materials, photographs, blueprints and maps of cities to show past present and future, as well as geographical and/or three-dimensional map symbols and multiple forms of mark-making. In her earlier work, *Stadia* 11, 2004, (Figure 33), Mehretu explores such themes as nationalism and revolution occurring in art, sport and contemporary politics. The black centrifugal lines could be interpreted as the roof structure and lines of seating around a stadium or perhaps an amphitheatre or a political chamber. The reality is, that whoever views this painting will interpret the work in ways only relevant to their own experiences. In Mehretu's case, she interprets the work in a political sense since her tumultuous background of political unrest in Ethiopia caused her family's subsequent migration to the United States.

Mehretu layers architectural plans, diagrams, and maps of the urban environment with abstract forms and personal notations, resulting in compositions which convey the energy and chaos of today's globalised world. This corresponds to

concerns in my own maps that indirectly point to the causes of the pollution in Australia – the toxic products of mining and the shared angst of the decline in animal species caused by such mining and land degradation.

Figure 33: Julie Mehretu, *Stadia II*, (2004), ink and acrylic on canvas, 108 x 144 inches https://www.khanacademy.org/humanities/ap-art-history/global-contemporary-apah/21st-century-apah/a/47amue-mehretu-stadia-ii

Although Mehretu's abstract landscapes give the impression of a visual language of dots, lines, symbols and shapes, much the same as a cartographer relies on map-making marks, the result gives the impression of an aerial perspective. Her work alludes to architecture, geography, topography, autobiography and iconography, realising that research through an energetic, multi-layered and wildly chaotic mark-making. Such energy generated by her early works, mirrors that of the mid-20th century Abstract Expressionist movement. This art style is often characterised by energetic gestural brushstrokes or mark-making, giving the impression of spontaneity. Mehretu has been thought of as the heir to the US artist, Jackson Pollock, but where 'many of Pollock's paintings seem divorced from real-world antecedents', Mehretu's paintings focus on historical and current political rumblings.[56]

[56] A. Young, 'Julie Mehretu, Stadia 11', *Khan Academy* (n.d.), https://www.khanacademy.org/humanities/ap-art-history/global-contemporary-apah/21st-century-apah/a/julie-mehretu-stadia-ii, accessed 13 Aug. 2022.

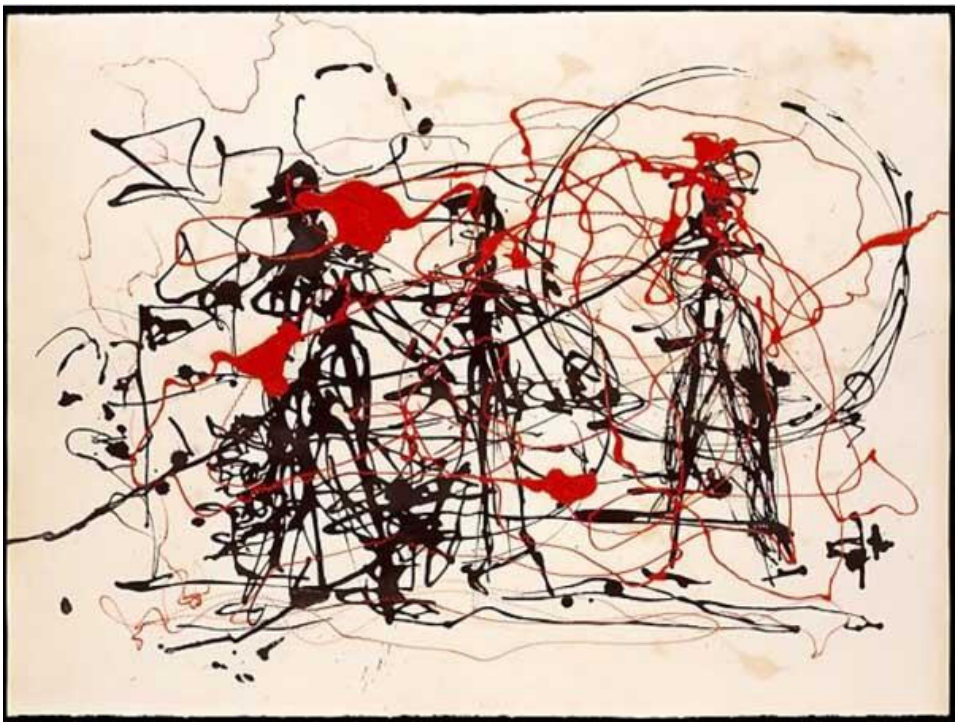


Figure 34:Jackson Pollock, *Untitled*, (1948-1949), https://www.metmuseum.org/art/collection/search/482447

Putting aside Greenbergian[57] formal interpretations, Pollock's *Untitled*, 1948-1949 (Figure 34) shows the dynamic abstract composition that embodies a sense of harnessed energy and rapid motion, in a similar way as the energy that radiates from Mehretu's artworks, becoming a form of archaeological mark on the canvas where each pencil, paint or ink line, smudge or painted section becomes an extension of the artist's body. But unlike Mehretu and many other artists covered here, Pollock, like Mitchell mentioned above, maps the canvas interior, whereas the other artists discussed, map political, environmental or geographical areas or related topics within the canvas field. They map 'real' life concerns of our contemporary world external to the formal boundaries of the canvas.

[57] NOTE: Greenberg's Formalism involved a claim that each medium was working toward the revelation of the essence of that medium, and a judgment about painting's purity or autonomy.

Mehretu's more recent work reflects the state of our contemporary world, often with political undercurrents or sub-text. Interestingly, in an interview[58] between Mehretu and Danish, Louisiana Channel, web TV, she stated,

> a lot of our assumptions will be challenged, defining the reality of most people as living in between – of 'being and not being' at the same time. I am in a state of alert, a state of alarm.

Asked about the intensity of colour in the Metoiko series, *Dissident Score*, 2021, (Figure 35), Mehretu states: 'Well, we had Trump. You had to do something.' Those times were to her dismal, depressing and discouraging, so those riots of colour, to her, represented a state of alert or alarm, wildfires, conflicts at border control, the state of the landscape and people trying to escape it.

Figure 35: Julie Mehretu, *Dissident Score*, (2021), Ink and acrylic on canvas, 274.3 × 304.8 cm, https://www.barrons.com/articles/julie-mehretus-dissident-score-sells-via-artsy-for-us-6-5-million-a-record-for-the-artist-01623444460

[58] Louisianna Channel, 'Interview with Julie Mehretu: It's very hard to understand what our reality is', [video], YouTube (n.d.), https://www.youtube.com/watch?v=R71GBWjyjLE, accessed 30 Apr. 2023.

In an apparent dig at the idea of modernist reduction, Mehretu states,

> art's job is to complicate as much as possible. That's what we want art for; that's what we want poetry for—to be full of contradictions, or to expose contradictions. That's where radical possibility exists. Imagining other possibilities is how things change.[59]

What she is stating here is that the more provocative art is, the more it provokes an audience or viewer to take note and instigate action in their own way. Other artists have also influenced Mehretu, such as UK artist, draftsman, photographer and filmmaker, Tacita Dean, whose large-scale murals convey Dean's investigations into chance, memory, entropy, history and the passing of time.

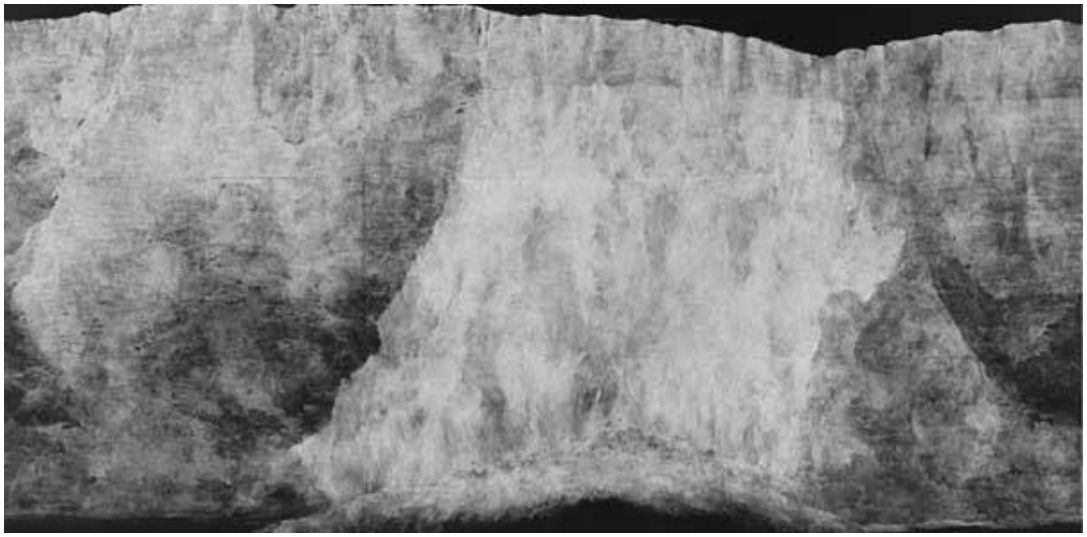


Figure 36: Tacita Dean, *Chalk Fall*, (2018), chalk on blackboard, 365.8 x 731.5cm, Queensland Art Gallery of Modern Art
https://www.qagoma.qld.gov.au/air-introduction/tacita-dean/

In the painting *Chalk Fall*, 2018, (Figure 36) Dean evokes the famous white cliffs of Dover which are eroding evermore swiftly because of climate change. Her use of chalk as a medium, on black painted Masonite emerges as a new visual language that might refer to history, poetry, cinema, memory place, nature, light, time, life, and death, all at once, and with the ease and elegance of a single hand

[59] W.J. Simmons, 'Julie Mehretu insists on Opacity', *Cultured* (2019), https://www.culturedmag.com/article/2016/09/13/julie-mehretu, accessed 23 Mar. 2022.

gesture. In this case, Chalk Fall refers to the collapse of parts of the white cliffs of Dover, an analogy to Brexit, the collapse of reason.

Large-scale works are a feature of these influential artists, and as Mehretu explains 'I am looking for that space where you can't have that singular, particular experience. It's about what is undefined, unstable – and for me, that's important politically'.[60] Mehretu and Dean have influenced my own artwork, sometimes directly through interpretation of works and sometimes indirectly, through tacit meaning. In particular the size and scale of their works were metaphors for the immensity of the problem of how, as an artist, to address the issues of large-scale land degradation, but also to acknowledge the very fact that the materials and technology that I use to make this artwork, are a direct result of such degradation. Mehretu's and Dean's works have distinct political undertones and these align with the politics and economics behind the decisions to allow such mining and other degradations that have affected landform changes since human intervention.

Like Mehretu, whose family fled political instability in Ethiopia, the parents of Australian artist, Imants Tillers, fled post-war Latvia. Such displacements of country and culture had a profound effect on both artists and their artwork, incorporating themes such as the state of their contemporary world. Tillers series *Diaspora*, 1992-2020, (Figure 37) large-scale paintings of which there are several in the series, are seen as epic statements relating to the dislocation of peoples from their original homelands and the coming together of a variety of cultures, forming a diverse mix of people in various stages and states of belonging and becoming. These themes appear on his signature grid-style canvas boards where he appropriates and juxtaposes existing artworks, combining ideas, literature and 'ready-made' poetry together in his paintings. Tillers uses the grid system in his works as a compositional device, giving the impression of the familiar folded creases of a well-worn map. This work gave me the idea of thinking of the map as folded[61], as hiding the unsightly

[60] R. Lesso, 'Julie Mehretu: Mapping the Modern World', *the thread* (14 Oct. 2019), https://blog.fabrics-store.com/2019/10/14/julie-mehretu-mapping-the-modern-world/, accessed 6 Jul. 2022.
[61] See Appendix D

consequences of mining on the environment, to which I responded with the provision of a folded gallery catalogue[62] directing viewers to each section of the exhibition.

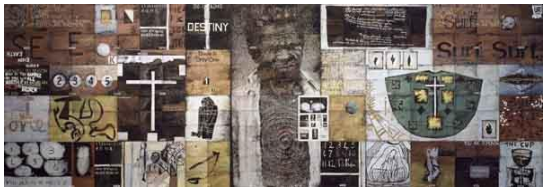
Each individual board numbering from one to infinity are part of a continually expanding whole, where the work can expand or retract, dependent upon whether Tillers wishes to make the work smaller or add additional board panels to expand its scale.

[62] See Appendix C

Diaspora – 1992

Izkleide – 1994

Paradiso – 1994

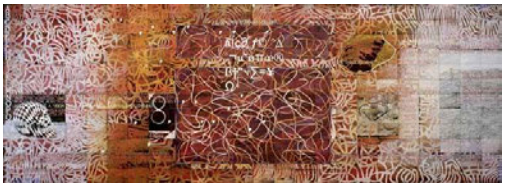


Farewell to Reason – 1996

Monaro – 1998

Mexico – 2001

Terra Incognita – 2005



Terra Negata – 2005

Lacrimae Rerum – 2007

Tabula Rasa

Terra Nullis – 2020

Figure 37: Imants Tillers, *Diaspora* series, 1992-2020
https://www.imantstillers.com/diaspora-series.

To interpret just one of those paintings in the *Diaspora* series (Figure 37), *Tabula Rasa,* (Figure 38) is an extremely complex compilation of meanings. This painting consists of four separate paintings appropriated by Tillers. Firstly, Fred

Williams' painting *Karratha Landscape*, 1981, (Figure 39) which depicts the Pilbara region in Western Australia to essentially map his father's travels to remote parts of Australia. Tillers, secondly, appropriates Australian Rosalie Gascoigne's *Monaro*, 1989, (Figure 40). Thirdly, he appropriates part of Australian Samuel Namunjdja's works, *Untitled*, 2006, (Figure 41) as well as inscribing the Indigenous language groups and place names of those regions travelled. While appropriating the above paintings he also reflects on what his Latvian father must have thought of the vast barren Australian landscape. He does this around the edge of all the works he paints by including in blue the words by French poet, Stephane Mallarme "a throw of the dice will never abolish chance", meaning, a liturgy which embodies a universe without law or reason, with only contingency.[63]

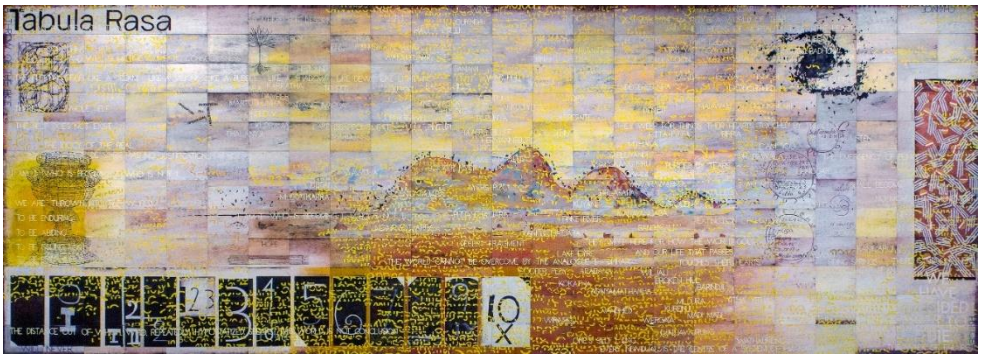


Figure 38: Imants Tillers, *Tabula Rasa, (For my Father),* (2011), synthetic polymer paint, gouache on 288 canvas boards nos. 87889-88176 303 × 850 cm

[63] M. Wark, 'The Nothingness that speaks French', *Public Seminar*, *Uncategorised,* 2 (13 Nov. 2014), https://publicseminar.org/2014/11/the-nothingness-that-speaks-french/, accessed 13 May 2023.

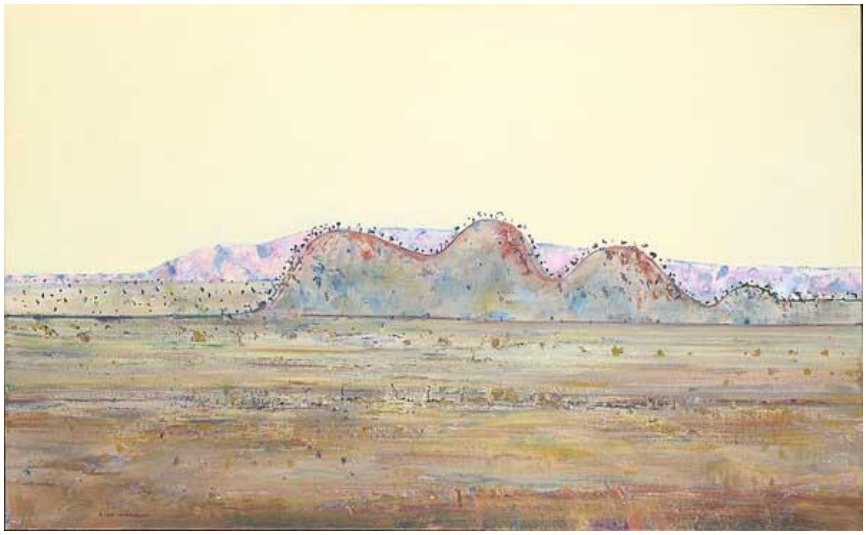


Figure 39: Fred Williams, *Karratha*, (1981), oil on canvas,121.6 × 198.1 cm
https://www.ngv.vic.gov.au/explore/collection/work/69554/

Figure 40: Rosalie Gascoigne, *Monaro,* (1989), synthetic polymer paint on sawn and split soft-drink wooden crates on plywood, 131 x 457 cm (overall)
https://collection.artgallery.wa.gov.au/objects/9705/monaro

Figure 41: Samuel Namunjdja, *Untitled*, (2006), natural earth pigments on eucalyptus bark https://www.invaluable.com/auction-lot/56amuel-namunjdja-untitled-gungura-2006-99-c-e37405b8e6

By collectively drawing upon, using and collapsing these various appropriated sources into the one artwork, Tillers is responding in part to the dramatic political events of his parents' homeland, the collapse of the Soviet Union in 1991 and the Baltic States regaining independence after more than 40 years of political repression. Such was the inherited culture from his parents, which had a profound effect on his art. Tillers' strategy in appropriating these various artworks was to show those connections in his paintings that make up the stories of those remote locations of his father's travels from Riga, Latvia to Cooma in New South Wales and his subsequent travels across the remote locations to places like Port Hedland, Weipa and Kwinana. Tillers' use of the grid system to construct his works is also of seminal technical interest to the studio artwork that has been researched and produced for the earlier part of this research project, mainly because the grid represents latitude and longitude that are mandatory cartographic conventions, and ones I often deploy. To display the abstract works created for this project, I felt these conventional lines would be representative of those latitudinal and longitudinal lines by incorporating those geographical mapping conventions.

Mary Eagle, Senior Curator of Australian Art, National Gallery of Australia, writes in her review of Imants Tillers' book, *Credo*, (2022), 'what Fred Williams did for

contemporary perceptions of the Australian landscape, Tillers has done for Australian culture'.[64] He acknowledges our history of cultural dependence and recognises that there is a history of creative imitation, and makes imitation the grand theme of his own art. These ideas tie in with the French philosopher Jean Baudrillard's ideas of postmodern art where societies are organised around simulation, that is, models of mimicry, where identities are constructed by the appropriation of images. In other words, Baudrillard suggests that we have lost all contact with the real world and that reality becomes an imitation of the model, which now precedes and determines the real world. This is an important concept insofar as the theoretical underpinning of this exegesis goes as my focus is on the way representation of site often excludes, or even *occludes* geographical or material details that, if revealed, would considerably complicate our understanding of the role maps – of what is mapped and what is missing from the representation.

Another contemporary American artist, Deanna Lee[65] says that her work is 'invested in the hand-drawn line for its conveyance of individualism, imperfection, and frailty' stemming from patterns and traces of growth and decay in the natural world and the built environment. Her ink lines, *Eagle Street 1*, 2014 (Figure 42) evoke organic forms like hair, muscles, and fungi; natural systems such as waves and wind currents; geological strata; and topographical maps. It is these contour lines on maps that have their own individual beauty, creating swirls and patterns found in nature such as can be seen in rock formations and the bark of trees.

[64] I. Tillers, *Credo, Selected Essays,* (Giramondo Publishing Company, Sydney, 2022), https://giramondopublishing.com/books/imants-tillers-credo/ , accessed 20 April 2023.
[65] Robert Hill Contemporary, 'Deanna Lee: Echo Lineation' (1 Mar. 2012), https://www.roberthenrycontemporary.com/artists/deanna-lee/artwork/eagle-street-1, accessed 4 Oct. 2021,

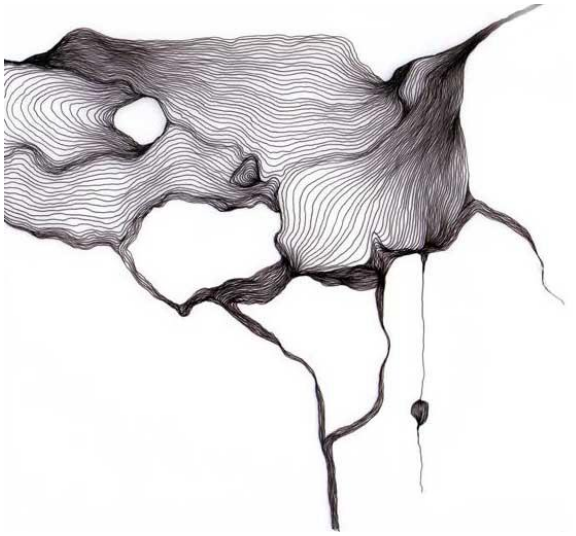


Figure 42: Deanna Lee. *Eagle Street 1*, (2014), Ink on vellum, 8.5” x 9” (22cm x 23cm) https://www.roberthenrycontemporary.com/artists/deanna-lee/artwork/eagle-street-1

Another contemporary artist, US based artist Pedro Lasch, created a collaborative installation between a gallery and a school which included two large map murals painted on the walls of the gallery, *Map showing changing demographics of North and South America, Collaborative Installation*, 2016 (Figure 43). One represented the changing demographics of North and South America and the other represented the ten most gerrymandered electoral districts in the United States. Additionally, the other included outcomes were a series of images created in workshops held during the residency using mirror masks which try to redress the silences and erasures of mapping by using protest and political commentary, thereby having both the power to reshape conventional thinking and facilitate plans for change.

Figure 43: Pedro Lasch, *Map showing changing demographics of North and South America, Collaborative Installation*, (2016), https://www.lycoming.edu/art/lasch.aspx

New Zealand based artist Ruth Watson's *Sculpture for Globes*, 2017 (Figure 44) is an example of a reconceptualised map based on the early twentieth century view of Mars crossed with canals. In this map its meanings have become more abstract in its representations, the lines and marks that might require some interpretative skill?[66] Watson claims 'I like the viewer to form interpretations of their own rather than my telling them what to think'.[67] This emphasis on the reception of the work, leaning of the viewer's interpretation, is a hallmark of conceptual art, from Duchamp onwards. After Duchamp, art making has two locations – the site of creation (artist) and the site of interpretation (spectator). Art always has a conceptual element. Lucy Lippard was among the first writers to argue for the 'dematerialisation' at work in conceptual art. By that she meant that the idea behind the art is paramount and the material form is secondary. Lippard further suggests that 'for most of us a map is a tantalising symbol of time and space. Even at their most abstract, maps (especially geographical and/or three-dimensional maps) are

[66] C. Ljundberg, 'Cartographies of the Future: Julie Mehretu's Dynamic Charting of Fluid Spaces'. *The Cartographic Journal,* 46/4 (2009), 308-315, Art & Cartography Special Issue. The British Cartographic Society.
[67] N. Plimmer, 'Five Questions for artist Ruth Watson', *ART ICLE MAGAZINE* (13 Mar. 2018), https://www.festival.nz/article/five-questions-artist-ruth-watson/, accessed 2 Oct. 2021.

catalysts, as much as titillating foretastes of future physical experience as they are records of others' [68] (or our own) past experiences.

Figure 44: Ruth Watson, *Sculpture 4 Globes: Telluric Insurgencies*, (2017), https://www.festival.nz/article/five-questions-artist-ruth-watson/

This dematerialisation takes the pressure off artists to represent the referent faithfully, as the duty of art, thus allowing for the category of 'art in general' to replace conventional emphasis on the medium or representational function. [69] For a map to be considered as art it needs to convey more than geographical truths. The Borges myth[70] talked about an empire that attempted to create a map of everything on Earth, eventually drawing one that covered the Earth's surface completely. In that same essay it was suggested that 'there is no longer a real because signs of the real have replaced the real'[71,] and in its place is a hyperreal. That is the inability of the consciousness to distinguish reality from a simulation of reality, especially in technologically advanced societies. If both art and maps have links to the virtual,

[68] L. Lippard, 'The Lure of the Local: Senses of Place in a Multicentered Society', *The NewPress* (Jun 2007), https://thenewpress.com/books/lure-of-local, accessed 19 Aug 2021.
[69] T. de Duve, *Kant After Duchamp*, MIT Press, Cambridge, Massachusetts, 1998.
[70] NOTE: Borges myth - wrote that to represent an irreducibly complex system such as the geography of a country, it must be an abstraction or simplification of the original and that the two extremes in that representation are useless: a reduced representation would be too abstract to adequately describe the system versus a representation that is just as complex as the system itself.
[71] K. Thomas, 'Monmouthpedia and the Fable of Borges' Map'. *Where My Books Go* (2104), https://kerilthomas.wordpress.com/2014/07/13/monmouthpedia-and-the-fable-of-borges-map/, accessed 19 Aug. 2021.

then this is another point where the two media join. I propose my ‘maps’ as virtual landscapes without a preceding territory. The ‘territory’ is created by the mapping of the canvas and other supports and thus the canvas is the territory!

While my submitted ‘maps’ address the changes in landforms over time by using data collected from a myriad of sources such as Google Earth, research papers, books and old atlases, there could be interpreted a subliminal message to address the reasons for these changes. Viewers might well ask, what, if not climate change, has bought on these different landforms. This could well lead to another set of maps that address this question more directly, such as mapping extinct or endangered species in those areas already mapped, or the well-being of people affected by such mining projects or nuclear testing. In this way these forms of maps would be more socio-politically and environmentally based rather than being aesthetic in a modernist sense of formal beauty.

American artist, Val Britton, creates immersive, collaged works on paper and site-specific installations that explore physical and psychological spaces such as *In the Half Light,* 2020, (Figure 45). Her fragmented, exploded landscapes draw on the language of maps to explore memory, history, and the possibilities of abstraction. The abstract collage works of mixed media and reclaimed materials create the illusion of the language of the topography of maps.[72] She suggests that ‘my works on paper help me piece together the past and make up the parts I cannot know’.[73]

[72]Gallery Wendi Norris, ‘Val Britton|Transmissions’ (28 Apr - 5 Jul. 2016), https://www.gallerywendinorris.com/artists-collection/val-britton, accessed 6 Jun 2022.
[73] K. Harmon, *Map as Art* (New York*:* Princeton Architectural Press. 2009) p.224.

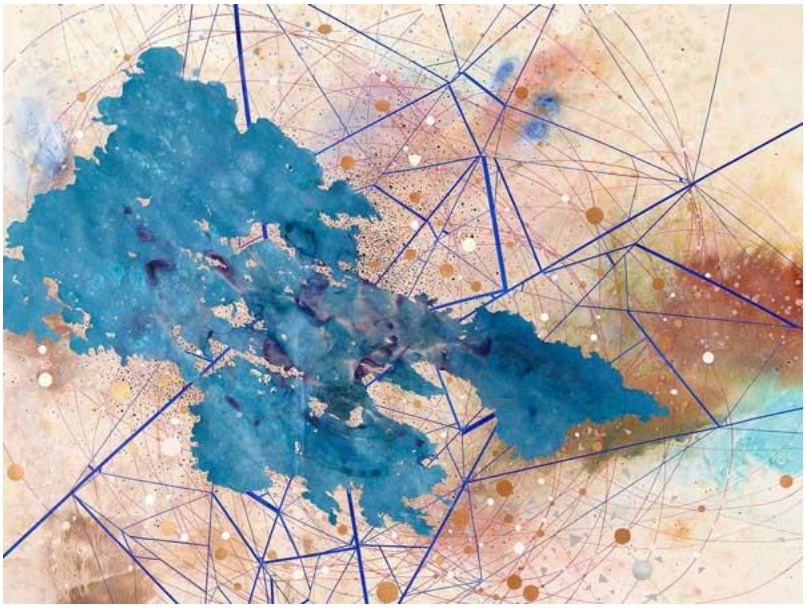


Figure 45: Val Britton, *In the Half Light*, (2020), acrylic, ink, and collage on paper, 182.9 x 213.4 cm https://www.gallerywendinorris.com/artists-collection/val-britton

American artist, Derek Lerner layers his maps in such a way that they reflect his thoughts on over-consumption, overpopulation, genetically modified foods, pesticides and poisons and other complex systems where his work explores systems: their creation, control, use, and experience of them' he states.[74] His compositions cause him to question his own involvement in the making of the maps since they are made with materials that are potentially damaging to the environment, a consideration I will also make during the research journey.[75] Topics that drive his thinking and production are infrastructures, climate change and overpopulation.

From an aerial vantage point, Lerner's compositions grow, line by line, through an additive, extemporaneous process into fictional spaces that juxtapose these systems, signs, and symbols. They encompass dualities that vacillate between micro and macro scales, dark and light, creation and destruction, human-made and nature-made. Bearing a strong reference to maps and blueprints, the shapes reveal, on close inspection, multi-lined, scribbled geometric drawings that could be interpreted as infrastructures and over-populated areas.

[74]D. Lerner, Derek Lerner, https://dereklerner.com/info
[75] NOTE: See Chapter 4 for more on this topic.

Figure 46: Derek Lerner, *Asvirus 54*, (2014), ink on paper, 1.4 x 2.5 m

Asvirus 54, 2014, (Figure 46) is one of Lerner's largest works to date and covers an area of 3.5 square metres. In 2015, New York's Metropolitan Transit Authority commissioned Lerner to create permanent public art for the Avenue X subway station on the F train, IND Culver Line in Brooklyn (Figure 47).

Figure 47: Derek Lerner, *AVEX1(station*), (2016), MTA Arts & Design commission – Avenue X Station in Brooklyn NY – F train, IND Culver Line – One of six 48" x 156" compositions (5 panels ea.) – Fabricated 0.875" depth laminated tempered glass

What draws me to this artist's work is not only the dramatic geometrics of each design, but what has inspired him to create these shapes, such as the oblique shapes of compact disks, graffiti on a brick wall and abandoned foundations of an old building, just as the shapes of mines and dams seen from my Google Earth

searches have influenced my work. Lerner's use of the monotone shades of blue, emphasise his thoughts of creation and destruction, while in my work, for example, the black paint in the *Altered States* series symbolises degraded land areas.[76]

North American artist Emily Garfield draws imaginary maps, one of which is *Watauga Wander*, 2019, (Figure 48), that evolve during the process. Her intricate pen and watercolour drawings are inspired by the visual language of maps, as well as the fractal similarity that cities share with biological processes such as the formation of patterns of cells and firing of neurons.

Figure 48: Emily Garfield. *Watauga Wander*, (2019), https://www.emilygarfield.com/blog/

UK artist, Ed Fairburn repurposes old maps found in charity shops, online stores, and second-hand bookshops by transforming them into beautiful, highly detailed portraits. During his process, he spends hours studying the map's terrain before starting, striving for a strong composition, visualising the portrait to be extracted against the geographical terrain of the map, but harmonising the two in one physical space, overall allowing his instinct to follow what the landscape suggests.

By merging landscape and the human figure, Fairburn reminds us that we are a product of our environment – and vice versa. His geographical map renderings are an excellent example of combining mapping conventional ideas into one image, highlighting the relationship of the human, *Denver Southbound*, 2015 (Figure 49) and

[76] NOTE: See Chapter 4 for an image of the work and a discussion of this series.

the landscape surrounding it, alluding to our dependence on that landscape. Fairburn uses inks, paint, or pencil and slowly extracts features from that terrain by gradually changing roads, rivers and mountains. He has named this process ‘topopointillism’, a mix of topography and pointillism.

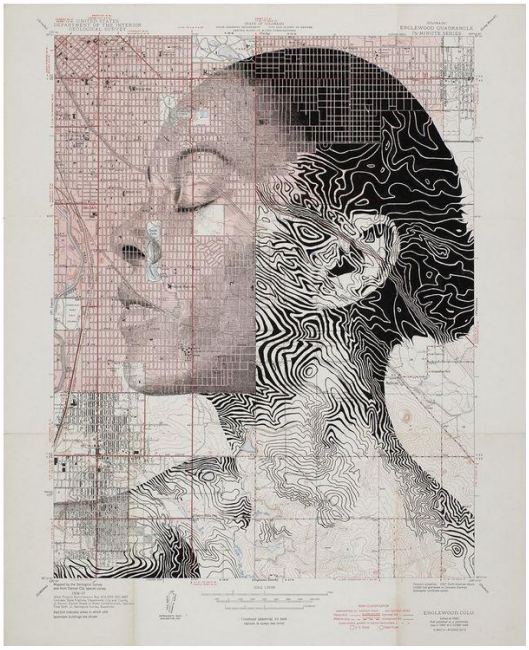


Figure 49: Ed Fairburn. *Denver Southbound*, (2015), Ink over a USGS topographic map of South Denver. https://edfairburn.com/project/denver-southbound/

1.5 Art and Artists in the Age of the Anthropocene

The Anthropocene is primarily a sensorial phenomenon: the experience of living in an increasingly diminished and toxic world[77] and is the era considered by scientists to have begun with the Industrial Revolution[78] where human activity, including intensive farming, mining, transportation and associated energy use, and the attendant release of greenhouse gases, has had a dramatic hand in warming the Earth’s climate. Such concerns have become more pressing since the 1950s, the time known as the ‘Great Acceleration’. This ‘Great Acceleration’ is well documented

[77] H. David and E. Turpin, *Art in the Anthropocene: Encounters among aesthetics, politics, environment and epistemologies,* (Open Humanities Press, 2015), 3.

by a series of socio-economic graphs[79] that generate a better understanding of the structure and functioning of the Earth System as a whole compared to earlier times, in particular, how the system changes. Anthropocene map artists reflect in their artwork, a concern for the environment in a variety of ways that do not necessarily follow cartographic conventions. Examples of the Anthropocene's affects can be found in the alteration of landscapes that have been scarred forever. Some of these landscapes are now explored through non-traditional and traditional research, Man-made landforms such as mines, dams and deforestation for building cities and roadways form part of this research, and are presented in Chapters 3 and 4.

Spanish artist and photographer, Daniel Beltrά is one such candidate for research. Beltrά concentrates his works on exposing all the aggressions unleashed on the planet that the natural world is suffering, something caused by human intervention. Beltrά's work *BP Deepwater Horizon oil spill, Gulf of Mexico*, 2010, (Figure 50) which documents the BP oil spill which released approximately 4,900,000 barrels of oil, of which only 800,000 barrels had been captured. The hyperlink that accompanies Figure 50 shows one of 18 photographs of that oil spill. His aerial photographs are painterly, abstract, beautiful, and sometimes disturbing, providing a better understanding of the problem of such issues as deforestation, global warming, (which refers to the rise in global temperatures due to the increase of greenhouse gases) and climate change (which refers to the increase in the measure of climate temperatures, precipitation and wind patterns over a long period of time).

Beltrά hopes to instil a deeper appreciation for nature by showing the precarious balance our lifestyle has placed upon the Earth's systems. His primary aim is to teach people about the dangers of climate change, stating 'the important part is to make people understand that we're all in this together, at the end of the

[79] W. Steffen, W. Broadgate & C. Ludwig, 'The trajectory of the Anthropocene: The Great Acceleration', *The Anthropocene Review*,2/1, (16 Jan. 2015) https://journals-sagepub-com.ezproxy.usq.edu.au/doi/10.1177/2053019614564785, accessed 25 Nov. 2023.

day, we all still live on the same planet—we all drink the same water, breathe the same air. I don't think there's anybody that wouldn't want to keep that healthy'.[80]

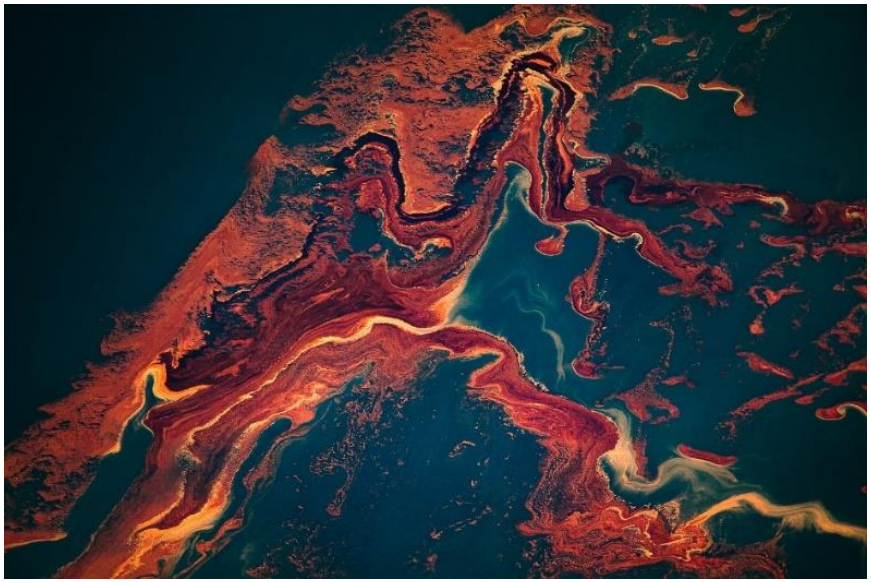


Figure 50: Daniel Beltrά, *BP Deepwater Horizon oil spill, Gulf of Mexico*, (2010), https://danielbeltra.photoshelter.com/portfolio/G0000N9uDgKewQWk/I0000gJy_ZNMJQN8

Canadian photographer Edward Burtynsky claims that nature has been transformed through industry, suggesting: 'We come from nature. There is an importance to [having] a certain reverence for what nature is because we are connected to it ... If we destroy nature, we destroy ourselves'.[81] Watching shipping in the Welland Canal, a man-made canal that connects two of the Great Lakes, Ontario and Erie, where Lake Erie, USA, meets the border of Canada, Burtynsky's imagination was captured by the scale of human creation, which in turn formulated the development of his photographic work. His imagery explores the collective impact we as a species are having on the surface of the planet – an inspection of the human systems we've imposed on natural landscapes. Burtynski argues, 'We are drawn by desire – a chance at good living, yet we are consciously or unconsciously aware that the world is suffering for our success. Our dependence on nature to

[80] J. Dotschkal, 'See Dramatic Views of Climate Change from Above', National Geographic (8 Apr 2016), https://www.nationalgeographic.com/photography/article/see-dramatic-views-of-climate-change-from-above?loggedin=true&rnd=1688362269697, accessed 5 Aug. 2021.
[81] E. Burtynski, 'Edward Burtynski, The Anthropocene Project' (n.d.), https://www.edwardburtynsky.com/projects/the-anthropocene-project, accessed 3 Mar. 2023.

provide the materials for our consumption and our concern for the health of our planet sets us into an uneasy contradiction'.[82] *Lithium Mines*, (Figure 51) demonstrates what Burtynsky calls the 'indelible human signature' on the planet, caused by incursions into the landscape on an industrial scale. Mining lithium to make batteries for electric cars, aims to solve one problem – carbon pollution – but creates another – the 'indelible human signature' in the form of toxic waste and alterations to land.

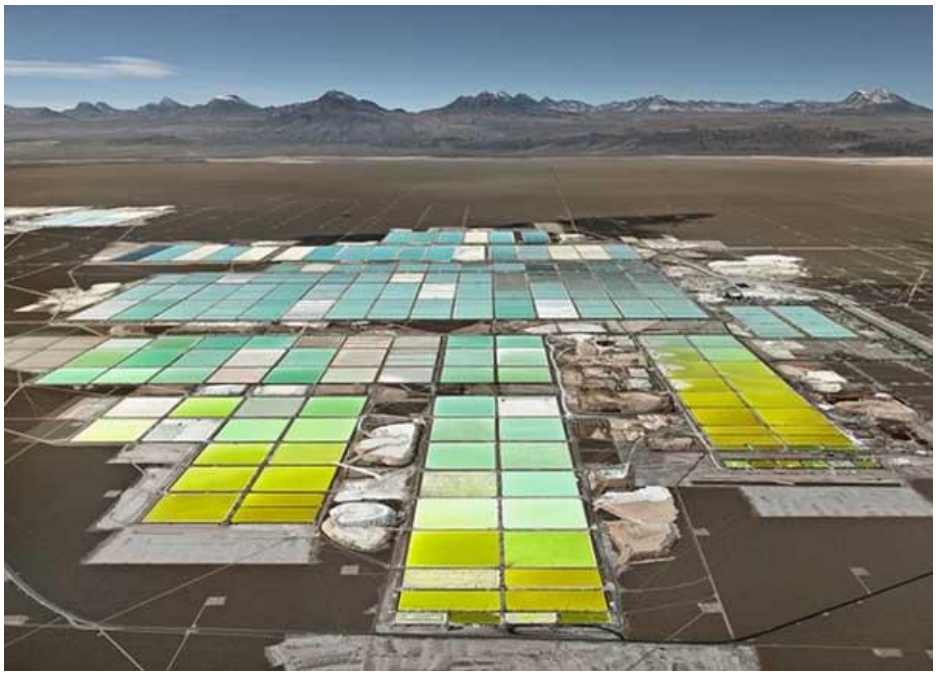


Figure 51: Edward Burtynski. *Lithium Mines*, *Atacama Desert, Chile*, (2017), https://www.newexhibitions.com/e/23223

US based artist, Phillip Govedare is interested in art in the age of the Anthropocene and echoes Burtynski's point. He states that 'his paintings are a response to the landscape we inhabit with all its complexity and layered meanings and are derived from sites that are both visually compelling and charged with implications of use, development and ownership ... the transformation of land and sky through industry and enterprise may be deliberate, or simply the unintended

[82] E. Burtynski, 'Edward Burtynski', *The Anthropocene Project*, (n.d.), https://www.edwardburtynsky.com/projects/the-anthropocene-project, accessed 3 Mar 2023).

consequence of the human impact on a fragile environment'.[83] His work offers an interpretation of our world today, and imparts an anxiety about the condition of the landscape and of nature. Govedare endeavours to create an imaginary response to an observed phenomenon, a metaphor blending apprehension and doubt about our place in the natural world, alluding to the past and simultaneously projecting into the future, *The Anthropocene,* 2018, (Figure 52).

Figure 52: P. Govedare, *The Anthropocene*, (2018), oil on canvas, 60" x 80", https://www.philipgovedare.com/

Argentinian digital artist Federico Winer uses satellite images from Google Earth, from which he created his *Ultradistancia,* 2021, a series exploring the patterns and geometries of the mines in the Gobi Desert. Manually, he isolates the features and alters the colours and backgrounds to create these animalistic, anthropomorphic, and incredible places where human presence has drastically altered nature's terrain. For example, Google Earth searches reveal this snapshot of the *Oyu Tolgoi* mine, 2016, (Figure 53) and Winer's interpretation using digital imagery to see *Oyu Tolgoi* mine, 2016, (Figure 54).

[83] P.Govedare, 'My paintings are a response to the landscape we inhabit with all its complexity and layered meanings' (2018), https://www.philipgovedare.com/about, accessed 2 Nov. 2022.

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Figure 53: Google Earth, Snapshot of Oyu Tolgoi mine, Gobi Desert, Mongolia, (2016).

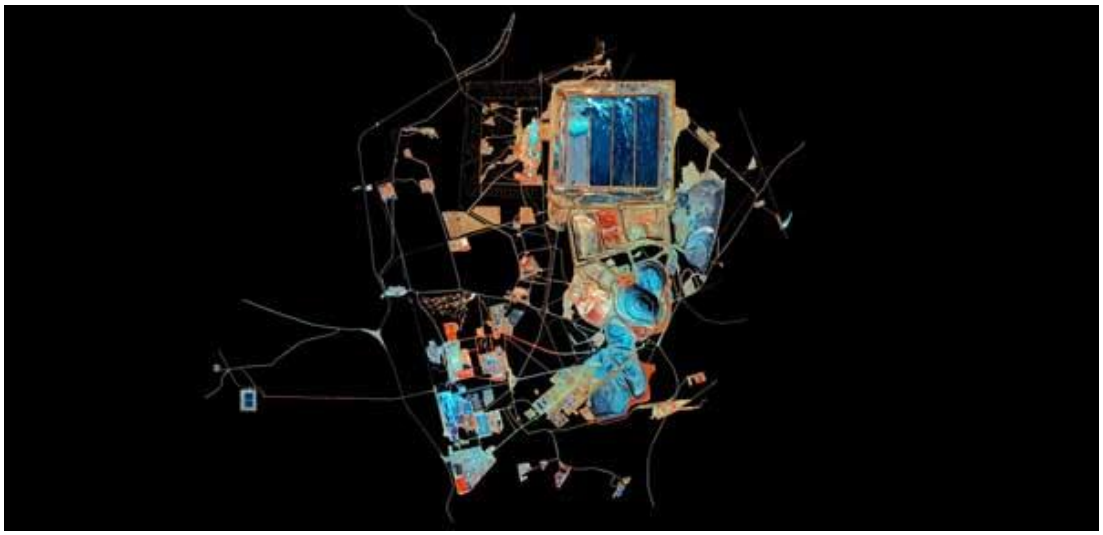

Figure 54: Federico Winer, *Oyu Tolgoi mine, Gobi Desert, Mongolia*, (2016), digital interpretation of Google Earth above

Another artist more recently identified is Richard Mosse, an Irish photographer who captures the environmental damage to the Amazon by fitting his camera to a drone and flying over sites of destruction and environmental crime. Experimenting with different camera settings, Mosse creates vivid topographies that show traces of environmental damage and degradation.

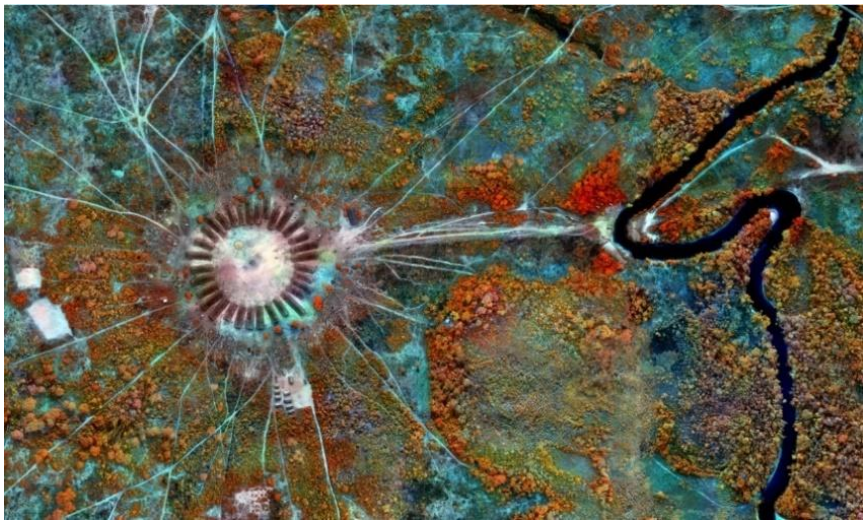

Figure 55: Richard Mosse, *Burnt Pantanal*, (showing aspects of deforestation in the Amazon)

Artists such as Edward Burtynski, Phillip Govedare, Richard Mosse and Federico Winer all alluded to the Anthropocene, emphasising the anxiety about the condition of the landscape, the transformation of the land and sky through industry, which was the focus of my work, especially the 'Altered States' of our mines and tailing ponds and other human interference effects on our landscape. When I refer to the work and by naming it 'Altered States', it is the combination of the dreadful and disastrous effects of that human intervention on our country, but at the same time the beauty of the forms, patterns and colours that make up the overall effects, suggesting that the beauty of traditional landscapes is being replaced by a kind of toxic or awful beauty. The word 'awful' as I have indicated in the introduction, is a deliberate play on the etymological roots of the word, having a historical link to the word 'awe' which is closely related to both 'reverence' and 'terror'. However, as mentioned in the Introduction it also references the modern day meaning where it is used to emphasize the extent of something unpleasant or negative, which the effects of mining on the land are examples.

1.6 Research of selected geographical locations

This sub-section covers selected geographical locations mostly referring to the changes brought on by the Anthropocene. Initially, concerns might include changes in sea levels rising around Port Philip Bay. Living on those shores as I do, they became of critical importance. From there it was a gradual process through

non-traditional and traditional research to find other areas that were of great interest, culminating in a body of work that included the topics of land clearing, deforestation, mining, and their resultant toxic tailing ponds.

The early part of this research was on Port Phillip Bay on the southern coast of Victoria, responded to research showing sea levels rising, causing changes to the shoreline over time. According to seismic studies, core samples and Port Phillip Bay itself have changed much over time.[84] Anecdotal evidence from Aboriginal oral traditions tell of Port Phillip Bay as a dry land mass with rivers running from north to south and west to east with other small tributaries and kangaroo and emu hunting grounds interspersed (Figure 56).

The bay covers an area of approximately 1,930 square kilometres and has water depths up to 22 metres. It is almost landlocked but open to shipping through deep channels that were once the course of the Yarra River and now only accessible through the narrow opening called The Rip.

Figure 56: Unknown artist's impression of how Port Phillip Bay may have looked 10,000 years ago.[85]

[84] G. R. Holdgate, B. Wagstaff & S. J. Gallagher, 'Did Port Phillip Bay nearly dry up between ~2800 and 100 cal. yr BP? Bay floor channelling evidence, seismic and core dating'. *Australian Journal of Earth Sciences,* 58 *(*2011), 157, https://www.tandfonline.com/doi/abs/10.1080/08120099.2011.546429, accessed 13 Jun. 2021.
[85] G. R. Holdgate, Submerged Landscapes of Port Phillip Bay, Australasian Institute for Maritime Archaeology Inc Newsletter, Vol 28, No. 3. Sept 2009,

I researched the history of Port Phillip Bay, and compared the Indigenous stories from ten thousand years ago to the current data from the Port Phillip Authority to calculate what the effects of climate change might have on the bay in 10,000 years to come. This was a fascinating process to actually draw on my map, places that are well known to me, that might one day be under water, and other parts that might become islands. This information was quite exciting, if somewhat trepidatious, to imagine the bay along which I walk every day, to visualise 'islands in the future'. I was immersed in an entirely different world. Conceptually I was in the present, drawing the past and the future of the shores where I live.

I'm not the only artist to have an interest in this region. The Indigenous artist, Mandy Nicholson painted a two-dimensional *Map of Port Phillip Bay* and its tributaries on kangaroo skin (Figure 57). In the middle is the Southern Cross which represents the Kulin nation she presents

> The swirling motion of water in Birrarung (the Yarra River) travels to Port Phillip Bay in the centre. The five circular shapes represent the five clans of the Kulin Nation: Dja Dja wurrung, Boon wurrung, Taun wurrung, Woi wurrung and Watha wurrung. The border represents the land of mountains and valleys around Birrarung and the connection of animal, land and water.[86]

This opened so many possibilities to me, in particular the use of kangaroo skin. Vellum, traditionally derived from calf skin, is now made from kangaroo skin. Vellum was a popular surface for traditional map-making. Having used kangaroo vellum previously during my Master's degree, I wanted to investigate and experiment with this material further as it conceptually referred to the ancient maps produced on animal skins, but was also used in a contemporary manner. I sourced a piece of kangaroo vellum from a local supplier. This conceptually referred to Mandy Nicholson's work on kangaroo skin, connecting the ancient Indigenous stories of kangaroos and emus being hunted on Port Phillip Bay when it was dry land and

[86] Culture Victoria, 'Map of Port Phillip Bay', *Culture Victoria* (2016), https://cv.vic.gov.au/stories/aboriginal-culture/ganagan/map-of-port-phillipbay/, accessed 24 Jul. 2021.

which tallied with my contemporary ‘maps’ as artworks of Port Phillip Bay made on kangaroo vellum, but without, to my mind, appropriating Nicholson since she worked on skin, rather than modern vellum. But there were cultural and legal issues to consider nevertheless.

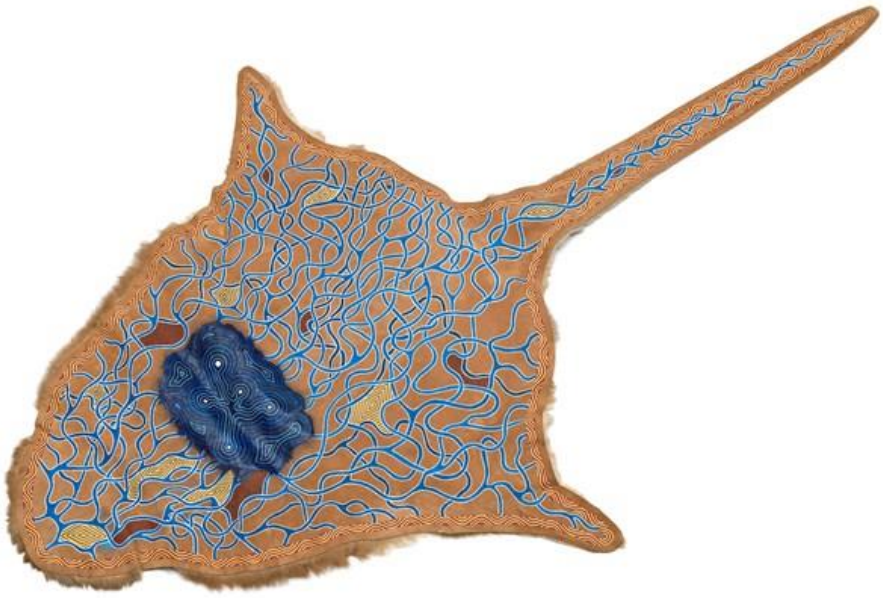

Figure 57: Mandy Nicholson [Wurundjeri], *Map of Port Philip Bay*, (c. 2000), paint, kangaroo skin, 128 x 80cm, Koorie Heritage Trust Collection, AH 3632 https://netsvictoria.org.au/artist/mandy-nicholson-wurundjeri/

Failing to find any contemporary artists using vellum – (although many botanical artists still prefer this support) - one can only assume that it is either too difficult to source, too expensive, or presents other limitations on size and uses or presents conceptual limitations. It also may conflict with some ideas of the use of animals in the making of art. In my case, the vellum had been responsibly sourced from the meat industry and specific guidelines are in place by the Australian Federal Government.[87] But how sustainable is the meat industry? Another disadvantage of using vellum is that it is regarded as permanent, or less biodegradable, which tends

[87] NOTE: All kangaroos must be harvested in compliance with the National Code of Conduct and with the Australian Standard for the Hygienic Production of Game Meat for Human Consumption as well as a range of other national, state and international standards. Compliance with conservation, animal welfare and food safety regulation is monitored by state and federal government authorities at each stage of the process to ensure standards are upheld.

to argue against the implications of my artwork, showing how human intervention has changed the land by deforestation, mining, and nuclear testing. These ethical considerations were pressing. However, from an artistic interest in the use of this material I pursued this idea to some extent – experimenting with the material while undertaking research into the ethical considerations. Ultimately, I decided to shift my research focus to the rising sea levels around Port Phillip Bay.

Another area of interest was ice-covered Antarctica, (Figure 58) the slow melting of which could affect the rising waters of Port Phillip Bay. Antarctica, over time, has changed from a sub-tropical climate during the early Eocene, which was about 55.8 to 33.9 million years ago, cooling down slowly over many millions of years and now melting at an unprecedented rate. These levels are monitored by scientists at NASA with modern satellites, which measure these gains and losses with ever-increasing precision. In 2020, scientists found that ice losses around the edges of Greenland and West Antarctica have contributed 14 millimetres (0.55 inches) of sea level rise since 2003. That is one-third of the total amount of sea level rise observed over that period. The subject of sea levels in that area is so diverse that it was decided that these facts should possibly be covered in a separate study [88], even though some early trial maps of this area appear in the final submission in Chapter 4.

[88] K. Patel, 'Taking a Measure of Sea Level: Ice Height', *Earth Observatory* (n.d.), https://earthobservatory.nasa.gov/images/147438/taking-a-measure-of-sea-level-rise-ice-height, accessed 3 Nov. 2021.

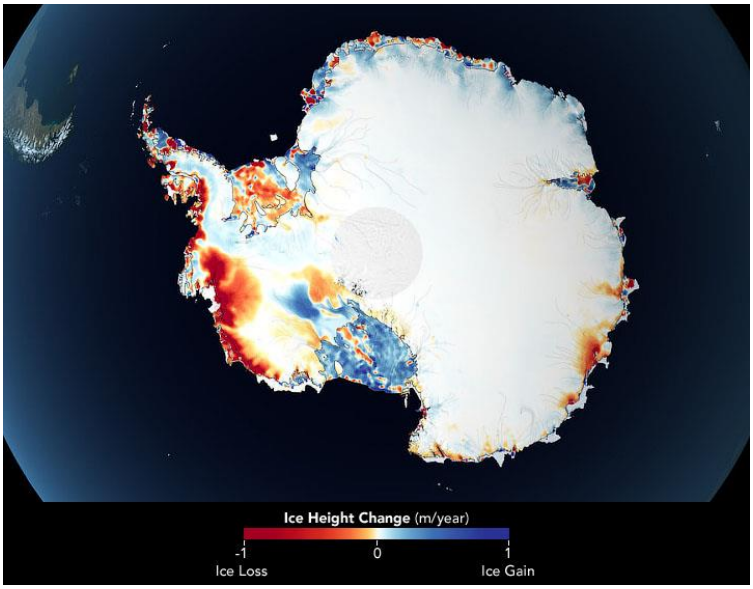

Figure 58: Ice height change between 2003 – 2018
https://earthobservatory.nasa.gov/

Other geographical territories of interest for research have included The Great Artesian Basin or parts thereof and the extinct area of water known as Lake Bungunnia, which was a substantial body of water of over 40,000 square kilometres, and once encompassed a large part of the Murray-Darling Basin some 2.4 million to 700,000 years ago, compared to Sydney Harbour, (an area of 55 square kilometres). It existed for over 2 million years, with only small parts remaining, such as Lake Tyrrell, a shallow, salt-crusted depression located in the Mallee, and Lake Hindmarsh, located in the Wimmera, both regions in northern Victoria and further to the north, the Menindee Lakes and Mungo lakes in New South Wales.

Other selected geographical territories such as bauxite mines in Weipa, on the Cape York Peninsula, Queensland, have been underway for 74 years and the mines in Mt Isa, also in Queensland, have been operating for nearly a century, causing significant damage to the land and the surrounding environment. I therefore concentrated on the mining sector of Australia with a view to exposing by mapping the toxicity of the tailing ponds of those mines as well as the deforestation and clearing of the lands for cities, roads and dams. Through the mining process, the land has been altered in numerous ways. Habitats have been destroyed, animal and plant species are endangered or extinct or pushed to the brink of extinction, with many unlikely to recover.

By reconceptualising or deconstructing them, artists can create new geographic domains that expand our engagement with maps beyond the original scientific or utilitarian purposes. Artists are free to disobey mapping conventions, free to conceptually explore the world, their world, and as J. B. Harley claims, 'we should encourage an epistemological shift in the way we interpret the nature of cartography'[89] as maps can offer ways of representing the past, present, and future landscapes in ways that conventional mapping cannot, because artworks offer innovative interpretations of those proposed landscapes, rather than direct copies or claims to scientific fact. This is the value of non-traditional forms of research. As such they present a new form of engagement with the pressing issues of our time. It is proposed the 'maps' submitted as the non-traditional component of this research project (covered in Chapters 3 and 4) are as virtual landscapes without a preceding territory, and ways of seeing the same site differently. This concept is demonstrated in the submitted maps where they stand are metaphors that illustrate the difference between the actual site and my understanding or perception of that site. It is an important concept to remember that the map is not the territory. The 'territory' is created by the mapping of the canvas and other supports, bringing about a new way to see that place.

I tend to agree with Siegert, where he stated,

> the main feature of the analysis of maps as cultural techniques is that a map is not a 'representation of space', but as spaces of representation and that maps contain less information about a territory than about the way it is observed and described.

This statement seems to coincide more with the abstraction of my proffered works rather than an accurate interpretation of the actual space under observation. After Baudrillard[90], art, and in particular, art as an abstract mapping of a territory, demonstrates how art is itself a simulation, rather than a scientific map of the real or

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[89] J.B.Harley, 'Deconstructing the map', *Cartographica*. 26, 2, (1992), 1-20. https://quod.lib.umich.edu/p/passages/4761530.0003.008/--deconstructing-the-map?rgn=main;view=fulltext, accessed 24 Jul. 2021.

[90] Baudrillard, J., *Simulacra and Simulation* (University of Michigan Press, 1994), https://www.google.com.au/books/edition/_/9Z9biHaoLZIC?hl=en&gbpv=1&pg=PA1&dq=Baudrillard,J.,+Simulacra+and+Simulation+university+of+Michigan+Press, accessed 7 Oct. 2021.

territory that is understood to be fixed. Representation is not a representation of a given real, but rather a presentation or frame through which we map a scene, in order to have people, as Thierry de Duve put it, ‘look’, see and reflect.[91]

[91] T. de Duve, Look! One Hundred Years of Contemporary Art, Ludion Editions NV, 2001.

CHAPTER 2: RESEARCH METHODOLOGY

Research is creating new knowledge.
Neil Armstrong

As a candidate in the Doctor of Creative Arts program at the University of Southern Queensland, a large part of the research undertaken in that capacity was into the different research methodologies with the aim of locating a methodology best suited for my particular style of working. Qualitative and quantitative methods of research were deployed, with qualitative forming the larger part of the research. Data and statistics were gathered and used to support qualitative methods of working, with practice-based methodologies emerging as the primary methodologies engaged in the research to produce non-traditional outcomes.

Practice-led and practice-based methodologies both offered potential working methods that would cover what I undertook in both traditional and non-traditional forms. During the research undertaken into a suitable methodology several interpretations of these methodologies were encountered, and in addition, a number of different terms for similar approaches to methodology emerged, and this ultimately led to the need to modify these methods to suit the specifics of the research project.

There is much confusion over the different terms found in the literature, terms such as practice-based, practice-led, creative practice and creative practice as research, studio-based research, creative arts research, creative production, to name the prominent examples. The decision as to which was the most appropriate research methodology to engage for this research project has not been easy. In my Confirmation of Candidature, I put forward a diagram, *Design of Research Methodology from Confirmation of Candidature* (Figure 59) that I thought at the time would fit my methodological approach to research. I was thinking in a cyclic manner, and referring to it as practice-based research. I needed to research the methods put forward by scholars to try and establish where my method sat and if it was suitable to the project.

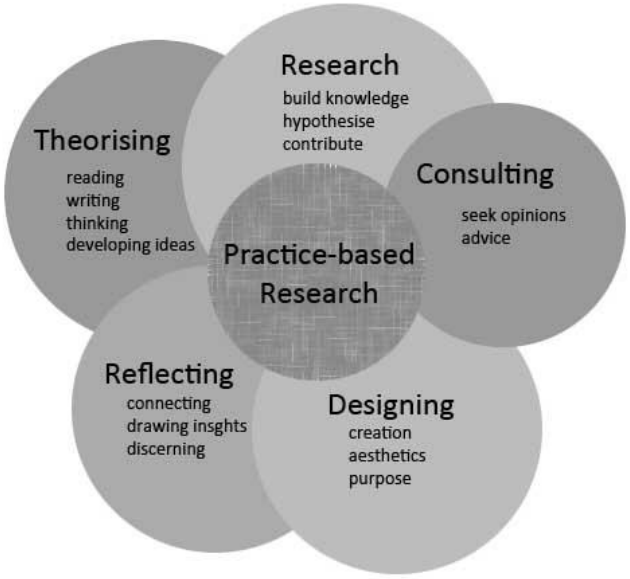

Figure 59: Loi Magill, Design of Research Methodology from Confirmation of Candidature, (2022).

Barbara Bolt and Estelle Barrett propose that artistic practice be viewed as the 'production of knowledge or philosophy in action'[92] drawing on Martin Heidegger's idea of 'handlability', that is, an assumption that our understanding of the world is predicated on our dealings in the world. Barrett claims that from artistic research, knowledge is derived from doing and from the senses. It was also claimed by the authors that practice-led research at the time of writing is a new species of research, a generative enquiry that draws on subjective, interdisciplinary and emergent methodologies that have the potential to extend the frontiers of research.

But some caution is necessary for the use of such methodologies, suggesting rigour is needed. Art historian Andrew McNamara[93] states that,

> the potential shortcomings of practice-led research within the postgraduate field, difficulties lie within the practice-led candidates where they tend to rely on a narrow range of formulations, making assumptions on the innovative

[92] B. Bolt, 'Heidegger, Handlability and Praxical Knowledge', *School of Creative Arts, University of Melbourne* (2004), https://acuads.com.au/conference/article/heidegger-handlability-and-praxical-knowledge/, accessed 7 Sept. 2021.
[93] A. McNamara, 'Six rules for practice-led research', J*ournal of Writing and Writing Programs*, S14 (15 Nov 2012),1-15, https://eprints.qut.edu.au/54808/, accessed 9 Dec. 2021.

nature of practice-led research and that its novelty is based in opposition to other research methods.[94]

He suggests that research is more complicated than simply making art and assuming its rigour at the outset. He argues that:

practice is not necessarily intrinsically research, often leading to redundant formulations and the hyper-self-reflexive nature of practice-led research.[95]

He concludes with the caveat that:

if these shortcomings are avoided, there is nothing to prevent some practice-led from further developing as a research inquiry and thus achieving rewarding and successful research outcomes.[96]

If we fall prey to McNamara's concerns, then we are not going to convince the power brokers in the industry of the value of the creative arts in the tertiary sector, let alone convince the public of the value of creative research to address the current climate crisis. Estelle Barrett argues 'there is a need to generate appropriate discourses to convince assessors and policy-makers that within the context of studio-based research, innovation is derived from methods that cannot always be pre-determined, and 'outcomes' of artistic research are necessarily unpredictable'.[97] Barbara Bolt tends to agree with this position where she proposes that 'creative arts practice, "research" commences in practice, in our dealings with the tools and materials of production rather than a self-conscious attempt at theorisation'.[98] Theory is not excluded from Bolt's position, but she cautions that it should not be the determining or driving force behind the creative component of the research.

[94] A. McNamara, 'Six rules for practice-led research', J*ournal of Writing and Writing Programs*
[95] A. McNamara, 'Six rules for practice-led research', J*ournal of Writing and Writing Programs*
[96] A. McNamara, 'Six rules for practice-led research', J*ournal of Writing and Writing Programs*
[97] E. Barrett. 'Introduction: art as the production of knowledge'. In Barrett, Estelle and Bolt, Barbara (ed), Practice as research: approaches to creative arts enquiry, 2007, I.B Tauris, London, England, pp.1-13.
[98] E. Barret, 'Introduction: art as the production of knowledge'

Lyle Skains[99] explains practice-based research where the creative act is an experiment, designed to answer a directed research question about art and the practice of it which could not be answered by other methods. 'We create art to connect with others and ourselves and experiment in order to push boundaries, ask questions and learn more about our art and role within it'.[100] She also argues that 'practice-based research provides us with a robust, nuanced research approach to help answer fundamental questions about practicing and performing art'. [101]

After consideration of these definitions and terminologies of practice-based, practice-led and others, it was found that practice-based methodology offered the most suitable method applicable. The present project deploys the reflexive process of practice-based methodology with an understanding of the broader field of art practice and theory against which, the merits of such a methodology can be determined. Since my research is predominantly (the created artefact) – the submission of works that contribute to new knowledge, then practice-based research best describes the methodology of my practice and strategy of working. The non-traditional works contribute new knowledge through the research frame that directs understanding towards the practice of mapping sites, not as mere representations of a given or fixed site, but one that is contested and constructed by the created artefact. Such research plays an important part in new understandings about practice and non-traditional research because placed together and combined with traditional research methods, it generates new knowledge that can be shared via an exegesis and a body of practical artworks. The diagram of how I see my practice-based research, a cyclic method of working can be seen earlier (Figure 59).

Graham Sullivan,[102] writes of two research models, practice-based research and practice-led research, but does not differentiate between the two, noting that practice-based research is a term more commonly used in visual arts programs in

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[99] L. Skains, *Creative Practice as Research: Discourse on Methodology. Media Practice and Education* (Taylor and Francis Online, 2018), 86, https://www.tandfonline.com/doi/full/10.1080/14682753.2017.1362175 accessed 18 Apr. 2022.
[100] L. Skains, *Creative Practice as Research: Discourse on Methodology. Media Practice and Education* (Taylor and Francis Online, 2018), 86, https://www.tandfonline.com/doi/full/10.1080/14682753.2017.1362175 accessed 18 Apr. 2022.
[101] L. Skains, Creative Practice as Research: Discourse on Methodology. Media Practice and Education
[102] G. Sullivan, 'Research Arts in Arts Practice', Studies in Art Education' (Fall, 2006), Vol. 48. No. 1, *National Art Education Association*, https://www.jstor.org/stable/25475803, accessed 3 Apr. 2022.

higher education. However, in the Australian context, we often encounter practice-led methodology. Regardless of the terminology, Sullivan suggests that 'knowledge embedded in practice, knowledge argued in a thesis and knowledge constructed as discourse within the institutional setting all contribute to new knowledge'.

Sullivan's position is nicely summed up by Julia Marshall who writes, 'in practice-based enquiry, analysis of images is only a part of a reflective process; the creation of images is the primary mode of enquiry'.[103] This emphasis on the creation of images, not as research in their own right, but rather the key component of research, with the other being the interpretation of images, aligns somewhat with Andrew McNamara's caution not to 'conflate research and practice', meaning the two are critical forms of enquiry that are complimentary, but also different. Practice or non-traditional research works alongside traditional forms.[104]

While Sullivan claims that the two research models – practice-based and practice-led – are the same, Linda Candy, differentiates between the two.[105.] She claims 'that there are two types of practice related research: practice-based and practice-led, where if a creative artefact is the basis of the contribution to knowledge, the research is practice-based and if the research leads primarily to new understandings about practice, it is practice-led'.[106] In a later paper on the same topic, Candy makes the point that while the term '*practice-based research* has become widespread in creative arts research' it has 'yet to be characterized in a way that is agreed upon across the variety of disciplines where it is in use' and this is the key reason for exploring the many variants and sub-variants of its overarching terminological form.[107]

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[103] J. Marshall, 'Images as Insight: Visual Images in Practice-Based Research', *Studies in Art Education*, (2007), Volume 49 (1), pages 23 – 41.
[104] A. McNamara, 'Six Rules for Practice-led Research' J*ournal of Writing and Writing Programs*, S14 (15 Nov 2012), p. 8, https://eprints.qut.edu.au/54808/, accessed 7 Dec. 2021.
[105] L. Candy, 'Practice-Based Research: A Guide', *Creativity & Cognition Studios*, *University of Technology, Sydney*, (2006), 1, https://www.creativityandcognition.com/wp-content/uploads/2011/04/PBR-Guide-1.1-2006.pdf, accessed 2 May 2022.
[106] L. Candy, 'Practice-Based Research: A Guide'
[107] L. Candy & E. Edmonds, 'Practice-Based Research in the Creative Arts: Foundations and Futures from the Front Line' (2018), http://lindacandy.com/wp-content/uploads/2018/02/018-LEON_a_01471-Candy-web.pdf, accessed 25 Oct. 2023.

Hazel Smith and Roger Dean suggest ‘research-led practice and practice-led research should not be seen as separate processes but rather as an iterative cyclic web’[108], (Figure 60) where both types of researchers move in diverse ways across boundaries in their imagination and intellectual pursuits, which in turn divulge different perspectives and practices to be explored.[109] One of the intentions of Smith and Dean is to suggest that non-traditional research or academic research can commence at any point on the diagram and move in any direction to any other point. An important feature is the concept of iteration, sometimes repeating a point several times, sometimes with variation, before proceeding. This diagram has similarities to my own method of working explained in my diagram (Figure 61), which gives my own version of practice-based research.

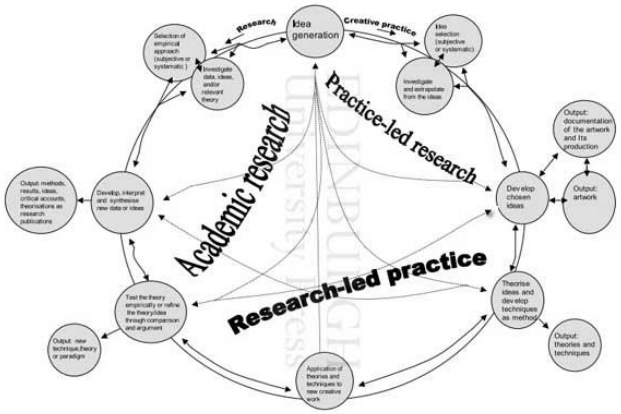

Figure 60: Smith and Dean, A model of creative arts and research processes: the iterative cyclic web of practice-led research and research-led practice

[108] H. Smith & R. Dean, Practice-led, practice-based in the Creative Arts (Edinburgh University Press, 2009), https://ebookcentral-proquest-/com.ezproxy.usq.edu.au/lib/usq/detail.action?docID=475756, accessed 7 Sept. 2021.
[109] H. Smith & R. Dean, Practice-led, practice-based in the creative arts.

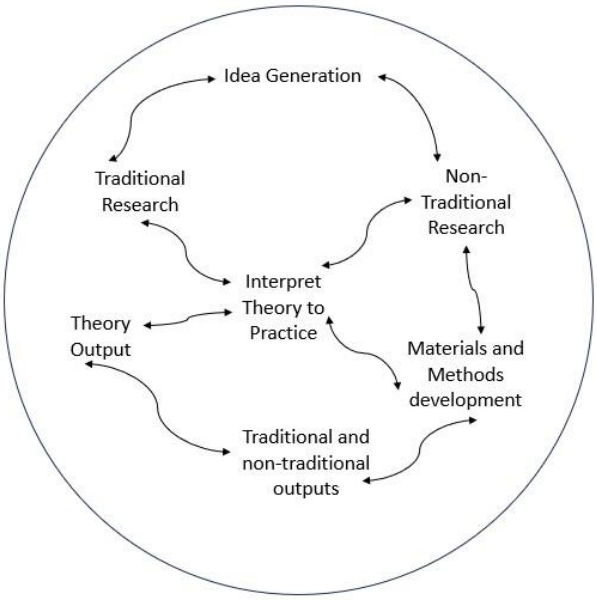

Figure 61: Loi Magill, *Practice-based research diagram* (2023)

Gray and Malins describe practice-based research through a constructivist lens, where the practitioner shapes the research findings in the form of visual images that construct meaning.[110] This constructivist approach defines the studio research as iterative and cyclical, with ideas and images progressing together – an understanding that influenced my own approach.

My diagram of how I see my practice-based research as a cyclic method of working, is outlined in *Practice-based research diagram* (Figure 61) above, which can be read as follows. Firstly, the circle titled 'idea generation' means that an idea has to come from somewhere, from prior experience with art and related ideas, an outside influence such as a political issue, a suggestion from a colleague or friend, or some other trigger that generates an idea. From that trigger idea a research process commences, both traditional and non-traditional, depending on the idea. For example, following a non-traditional research idea, the words 'inland sea' could send one in the direction of searching for images of that sea, and exploring methods of making whereas traditional research could investigate any documented accounts of such a sea. In either case, or for that matter, in both cases if such information was discovered, it could become a cyclic method of interacting with each other and the

[110] G. Gray & J. Malins, Visualizing research: A guide to the research process in art and design, Burlington, VT, Ashgate, 2004.

backward and forward arrows show reflection at any given time, leading in either direction. If theoretical, then development of the idea is around that theory and involves consideration of how it may be applied to the non-traditional outcomes, not to generate works as illustrations of theory, but rather to engage the works through words that help explicate intentions or test the rigour of artistic processes. These reflections might raise issues with the work, or might suggest the theory is inadequate to illuminate the intention of the work. In any case, this cyclical, reflexive method of working was applied to the research project with the intention of allowing for the greatest amount of flexibility to respond creatively, but rigorously, to the topic under consideration. The method of working allowed for reflection on both successful creative works and failures, or rather experimentation that did not fulfil the research requirements upon further reflection. The intention was not to create an exhibition, but rather to stage or present, through both final works, and supplementary experimentations, a process of critical and creative reflection through both traditional and non-traditional forms of research.

The reflective process of creating these artworks and responding to the thoughts and actions arising from that process, has enabled me to shift my creative arts practice into the domain of practice-based research. According to Tahera Aziz, practice-based research provides 'a mechanism for identifying and delineating specific dimensions of the art making process that could be articulated as academic research'.[111] These reflective thoughts involved trying to understand the reasons for making, and why the research is important to the broader field. A natural progression of this idea emerged through the process of practice-based research, where reflecting on one idea prompted further research into the history of those areas in a reversal of apparent causality – a retroactive engagement.

Another important part of practice-based research is that we also draw on memory which could prompt further research. An example of this was my recollection of a recent outback trip through Tibooburra, NSW to Innamincka, SA on Cooper Creek, almost following Charles Sturt's ill-fated 1845 attempt to discover an

[111] T. Aziz, 'Shifting the frame: from critical reflective arts practice to practice-based research', *Journal of Media Practice*, 10, 1, (2014), 69-80, https://www.tandfonline.com/doi/abs/10.1386/jmpr.10.1.69_1, accessed 12 Nov. 2021.

'inland sea'[112]. Sturt's whale boat (Figure 62) memorial stands in Tibooburra and this reminded me of that 'inland sea'.

Figure 62: *Sturt's whaleboat in Tibooburra*
https://www.aussietowns.com.au/town/tibooburra-nsw

At the same time as planning the studio work, traditional research was undertaken to determine how landforms had changed over time, which was then used as an aesthetic strategy for executing the variety of paintings and other works. Suggestions from a seminar such as the use of digital projections for data-based works were considered and researched as prompts for a series of works. Also, the best way to prepare, catalogue, remove, pack and send such a project for exhibition purposes was also considered. The end result was an exhibition in A Block Gallery (UniSQ) which is explained further in Appendix A.

[112] Monument Australia, Captain Charles Sturt's Expedition, 2010, https://monumentaustralia.org.au/themes/landscape/exploration/display/23476-charles-sturt-expediti, accessed 21 Mar 2024.

CHAPTER 3: PRELIMINARY INVESTIGATIONS

If you don't know where you are going, any road will get you there.
Lewis Carroll

This chapter covers the preliminary investigations undertaken, using traditional and non-traditional research methods that ultimately affected the final outcomes covered in Chapter 4. On reflection, at the start of the investigations, I thought I had a clear idea of where I was heading, but it eventuated, over time, that what I thought was a clear path, was in fact, only the start of a prolonged research and practical experience. At that time, it was frustrating not to have 'seen' what might have happened, but later realised that it was really part of practice-based research, reflecting, re-evaluating and re-doing some of the work.

For this research project I investigated numerous geological areas to see how landforms had changed due to human intervention – that is, since white people set foot in Australia. – the term for this change is 'the Anthropocene', 'an unofficial unit of geologic time', as explained in the Introduction. This term is used to describe the 'most recent period in Earth's history when human activity started to have a significant impact on the planet's climate and ecosystems'.[113] Initially I focused on Australia, and in part, the Antarctic, as a strategy of dealing with information that was within my immediate environment.

The first area of investigation, Port Phillip Bay, was quite lengthy and followed by an investigation into the Antarctic, an area of interest since the cause of the shorelines rising in Port Phillip Bay could be impacted by the melting of ice in the Antarctic. Further research led to an investigation of the Great Artesian Basin and part of that was the discovery of the now extinct Lake Bungunnia, part of the southern section of the Great Artesian Basin. The Great Artesian Basin stretched over a large part of the original Great Inland Sea which formed during the Cretaceous period (144 to 65 million years ago).[114] This, I felt, could be worthy of an

[113] National Geographic, 'Anthropocene', *Education*, (2022), https://education.nationalgeographic.org/resource/anthropocene/ accessed 6 Sept 2022.
[114] J. Hoare, Mystery of an Inland Ocean, https://lostinaustralia.org/australia-mystery-inland-ocean# accessed 1 Mar 2024.

investigation, because of the envisaged ‘vastness’ of the area which would be represented on a ‘vast’ area of the gallery.

This ‘vast’ artwork of the Great Inland Sea, conceptually reflects the vastness of the land, the monumental changes to the land over time, and the extensive changes to our landforms that have accelerated since the beginning of the Anthropocene period. Never having attempted anything so large before, it was impossible to envisage the problems that would ensue. Being a visual artist, I could imagine the end product gracing the wall in an exhibition space,[115] in a sense, site-specific, for the gallery in A block at the University of Southern Queensland. While these ‘maps’ are not site-specific in the strict sense of the term, the final outcomes respond to the wall on which they will be installed – creating a kind of dependence on the site. Although the Great Inland Sea was an area that provided a great range for research, it was an entirely different matter to create such an artwork. This research direction eventually ground to a halt because initially I was going to show how landforms had changed over time, but the reality was, it took millions of years for those changes to take place, and my focus was on the Anthropocene and those changes that have taken place during that time. The inland sea eventually dried up, (and it might well become inundated again over time). To resolve this, I undertook a number of measures. Adhering them to the wall, using a numbering system in order to assist with reproducing them in the University of Southern Queensland gallery in the same format. Following Tillers, I employed panels to create the grid system of aligning the boards, but encountered the problem of how to align the thirty-by-thirty-centimetre boards that were not exactly to that measurement and them not lining up properly. This was overcome by re-painting the smaller boards and placing them around the edges where those few millimetres would not be as noticeable.

Human intervention in more recent decades caused more changes in landforms by altering the land in far more destructive ways. For example, the Queensland Mt. Isa mine complex covers an above ground area of 43,310 square kilometres, bigger

[115] S. McLaren, M Wallace & T. Reynolds, ‘The Late Pleistocene evolution of palaeo megalake Bungunnia, southeastern Australia: A sedimentary record of fluctuating lake dynamics, climate change and the formation of the modern Murray River’, Science Direct, Paleogeography, Palaeoclimatology, Palaeoecology, (1 Feb 2012) 317-318, 114-127. https://www.sciencedirect.com/science/article/abs/pii/S0031018212000028, accessed 24 Mar. 2023.

than Switzerland and two-thirds the size of Tasmania. Also, it has over 16 hundred kilometres of mining tunnels underground.[116] That is only one mine, which has had a great expanse of land clearing over time. While the importance of mining is acknowledged,[118] there are environmental issues such as waterways contamination, toxic tailing ponds, abandoned mines and vast areas of land clearing for cities, roads, agriculture, and the pollution caused by such activities. It was these changes I wished to draw attention to using the envisaged maps.

While researching these changes, and in the most recent reported number of abandoned mines, I discovered that there are approximately 80,000 abandoned mines and over 350 operating mines in Australia.[119] The area of land that has been degraded is inconceivable, however, there have been some innovations put forward to repair some of this damage by some or all the following means –

> further mineral extraction via secondary mining such as reprocessing tailing, industrial, archaeological and heritage conservation as well as tourism. Provision for unique habitats for biodiversity enhancement and collaborative research into innovative solutions to contamination problems which could guide the broader industry.[120]

However, given historical attempts to reverse destruction or rehabilitate mined areas, with some 60,000 abandoned sites with no or inadequate rehabilitation, we need more than these kind of plans.[121] Argyle Mine is one such example, with

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[116] J. Shrimpton, 'Underground and above in Mt Isa', Australian Geographic (27 Aug. 2010), https://www.australiangeographic.com.au/travel/travel-destinations/2010/08/underground-and-above-in-mt-isa/#:~:text=Mount%20Isa's%20total%20civic%20area,thirds%20the%20size%20of%20Tasmania. accessed 19 Mar. 2023.

[118] NOTE: the Australian mining industry amounts to 75% of the country's exports, contributes significantly to Australia's workforce and is a leading influence on Australia's standard of living, rising incomes and flourishing economy.

[119] S. Haselgrove, 'Abandoned mines unlock hidden treasures' (18 Dec 2020), Australian Mining. https://www.australianmining.com.au/abandoned-mines-unlock-hidden-treasures/#:~:text=%E2%80%9CFor%20inactive%2C%20we've,the%20country%2C%E2%80%9D%20Yellishetty%20says, accessed 19 Mar. 2023.

[120] C. Unger, 'What should be do with Australia's 50,000 abandoned mines?' The Conversation (23 July 2014), https://theconversation.com/what-should-we-do-with-australias-50-000-abandoned-mines-18197, accessed 24 Nov. 2022.

[121] ABC News, 'Mining report finds 60,000 abandoned sites, lack of rehabilitation and unreliable data', Lateline, 2017, https://www.abc.net.au/news/2017-02-15/australia-institute-report-raises-concerns-on-mine-rehab/8270558

rehabilitation expected to take more than a decade to complete, with ‘at least five years of work to dismantle the tunnel supports’ let alone begin the revegetation work.[122] Very early on I spent some time looking at the Argyle Mine in Northern Territory, which had closed in 2020. The presence of the mine was not only an eyesore and source of grief for the traditional owners, the Gadigal and Miriwoong people, it was detrimental for many reasons. These include changing landforms not only by the actual mining process but the damming of the Ord River, changing its course and flooding areas of land. This section of the research is covered Section 4.3 which explains in detail the process and artwork produced.

Another topic I pursued was the disastrous effect on the land caused by the British nuclear testing at Maralinga. Maralinga is a remote location in the Great Victoria Desert of South Australia. One location called “Kuli” is still off-limits today, because it has been impossible to clean up. Plants generally will not grow on-site and the ones that do, get to a certain point, and die. In fact, an artificial mesa in the desert has been left containing 400,000 thousand cubic metres of plutonium contaminated soil,[123] rendering it unusable for thousands of years. In response I created a watercolour that eventually became part of the overall series ‘Altered States’ outlined in Chapter 4.

It is these and other degradations to the land that I have ‘mapped’, mainly to accentuate the way land is appropriated and changed for economic purposes and to show in an artistic way, how our environment is changing. To illustrate these ideas, the artistic investigations are described in the following sub-chapters. Several visual diaries have been compiled to document these processes and many references to these appear throughout the exegesis to add further explanation of the processes involved.

3.1 Port Phillip Bay

Early research into Port Phillip Bay involved looking into the different epochs and periods, to understand the time scales involved, such as ‘millions of years’, a span of

[123] M. Ladd, ‘The lesser known history of the Maralinga nuclear tests-and what it’s like to stand at ground zero’ (24 Mar 2020), *ABC News,* https://www.abc.net.au/news/2020-03-24/maralinga-nuclear-tests-ground-zero-lesser-known-history/11882608, accessed 19 Mar. 2023.

time I found difficult to imagine, therefore the image *Geologic Timescale Ver. 5.0 (2018)* (Figure 63) was downloaded to better understand where we, humans in the 'Anthropocene' fit into this time scale. Although the Anthropocene has not been officially recognised as a unit of geologic time, it is quite often used to describe the most recent period in Earth's history.

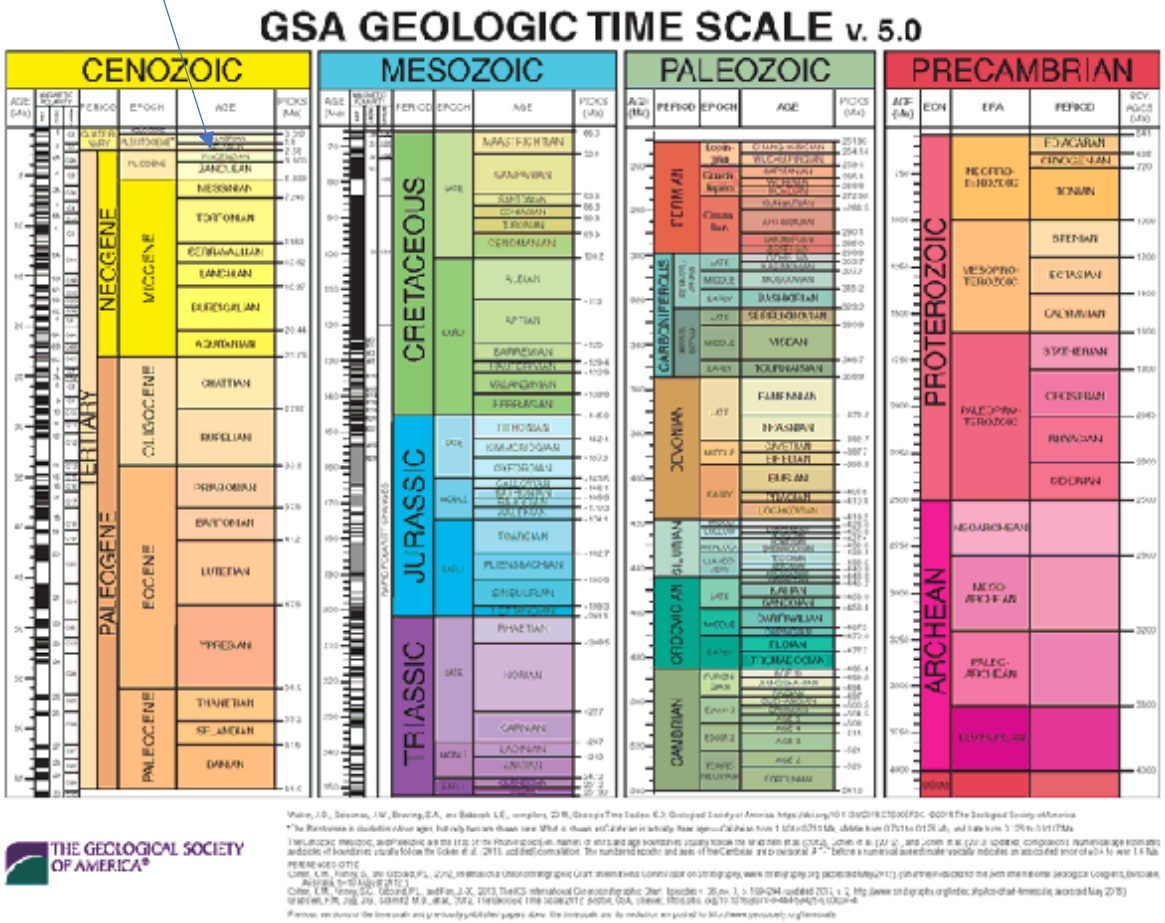

Figure 63: *Geologic Timescale Ver. 5.0*, (2018), https://www.geosociety.org/GSA/Education_Careers/Geologic_Time_Scale/GSA/timescale/home.aspx

Port Phillip Bay was an early topic of interest, as I have a personal interest in this environment, living on its shores and being aware of the prediction that sea levels are expected to rise in the future. The bay is situated on the southern coast of Victoria and covers an area of approximately 1930 square kilometres with water depths up to 22 metres. It is almost landlocked but open to shipping through deep channels that were once the course of the Yarra River and are now only accessible through a narrow opening called The Rip.

In 2017, The Flood Management Strategy for Port Phillip and Westernport made the claim that, like fire and other natural hazards, flooding is a certainty as part of our natural landscape, and a risk that will increase with climate change. The strategy plans for the management of those risks, thereby reducing the inevitable consequences[124] and sets out a vision for Port Phillip Bay and other nearby bays promoting a way to prevent flooding, and where not possible, respond to such floods. It is difficult to predict the future rising levels if such strategies are in place, however artistic liberty has been taken to project these levels based on the best science and Indigenous knowledge.

The CSIRO also have their own projection which gives an indication of the Bay's future climate conditions. They maintain that if we continue with our current rate of emissions, by the end of the century, less rainfall and more heating over land and higher sea levels will result in sea levels up to 82 centimetres higher than they are now expected.[125]

According to seismic studies, core samples and anecdotal evidence from Aboriginal oral tradition, Port Phillip Bay has changed significantly over time.[126.] According to seismic data from 1971 and Indigenous stories, the bay was once a land mass with rivers running from north to south and west to east with hunting grounds interspersed where kangaroo and emu hunting took place. Research[127] revealed the sea levels and their predicted future levels, were facts that led to my first artist's impressions (Figure 64). The changes that were mapped were of Port Phillip Bay as envisaged 10,000 years ago, the present shoreline and future predictions of that shoreline.

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[124] Melbourne Water, 'Planning for Sea Level Rise Guidelines. Port Phillip and Westernport Region' (2017), 12, https://www.melbournewater.com.au/sites/default/files/Planning-for-sea-levels.pdf, accessed 9 Sept. 2021.
[125] E. Wolanski, *Estuaries of Australia in 2050 and Beyond* (Netherlands, Springer, ProQuest Ebook Central, 2013), https://ebookcentral-proquest-com.ezproxy.usq.edu.au/lib/usq/detail.action?docID=1399082, accessed 3 Sept. 2021.
[126] G. R. Holdgate, B.Wagstaff & S.J.Gallagher, 'Did Port Phillip Bay nearly dry up between ~2800 and 100 cal. yr BP? Bay floor channelling evidence, seismic and core dating'. *Australian Journal of Earth Sciences,* 58, *(*2011), 157. https://www.tandfonline.com/doi/abs/10.1080/08120099.2011.546429, accessed 13 June 2021.
[127] G. R. Holdgate, B.Wagstaff & S.J.Gallagher. *Australian Journal of Earth Sciences,* 58, *(*2011), 157.

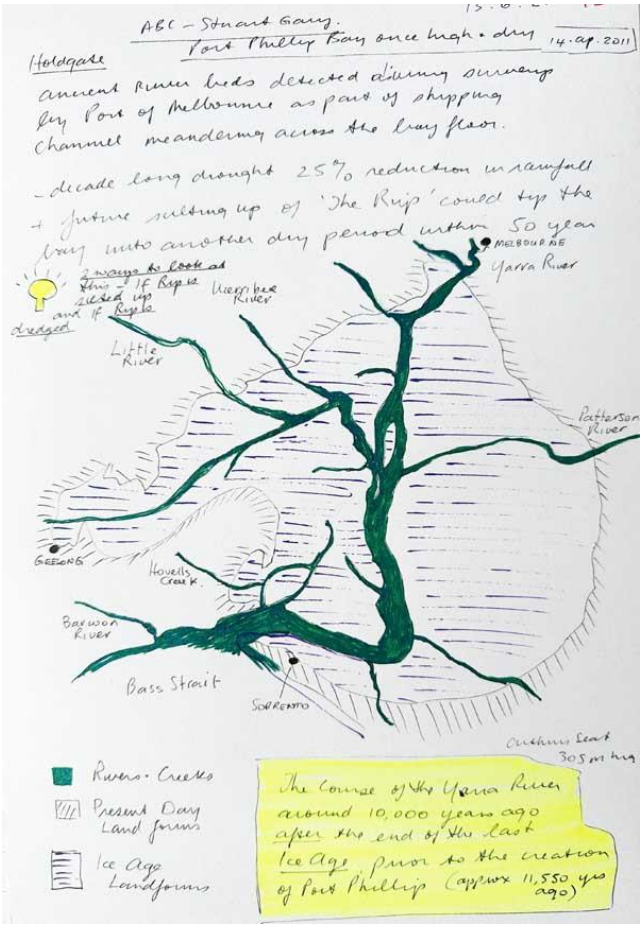


Figure 64: Loi Magill. Visual Diary 1 Page 15 record of the research into the course of the Yarra River around 10,000 years ago, (2021)

I learned that ancient riverbeds were detected during surveys by the Port of Melbourne as part of the shipping channel that meandered across the bay floor. It was also predicted that a 25% reduction in rainfall and the consequent silting up of the ‘The Rip’ (the entrance to Port Phillip Bay) could tip the bay into another dry period within 50 years, although, because of regular dredging of the channel to prevent blockages, Port Phillip Bay would be unlikely to dry out again. However, the northern end of the bay could be affected by rising sea levels due to global warming. I experimented with different materials and mediums to translate this information into various artworks, the first being *Impression of differing sea levels of Port Phillip Bay* (Figure 65). This sketch involved looking at the history of the Bunurong people who were part of a language group or nation known as Koolin who inhabited the area; their traditional lands encompassing the Werribee River in the north-west, down to Wilson's Promontory in the south-east, taking in the catchments of the old Carrum

swamp, Tarwin River and Westernport Bay, and including Mornington Peninsula, French and Phillip Islands.[128]

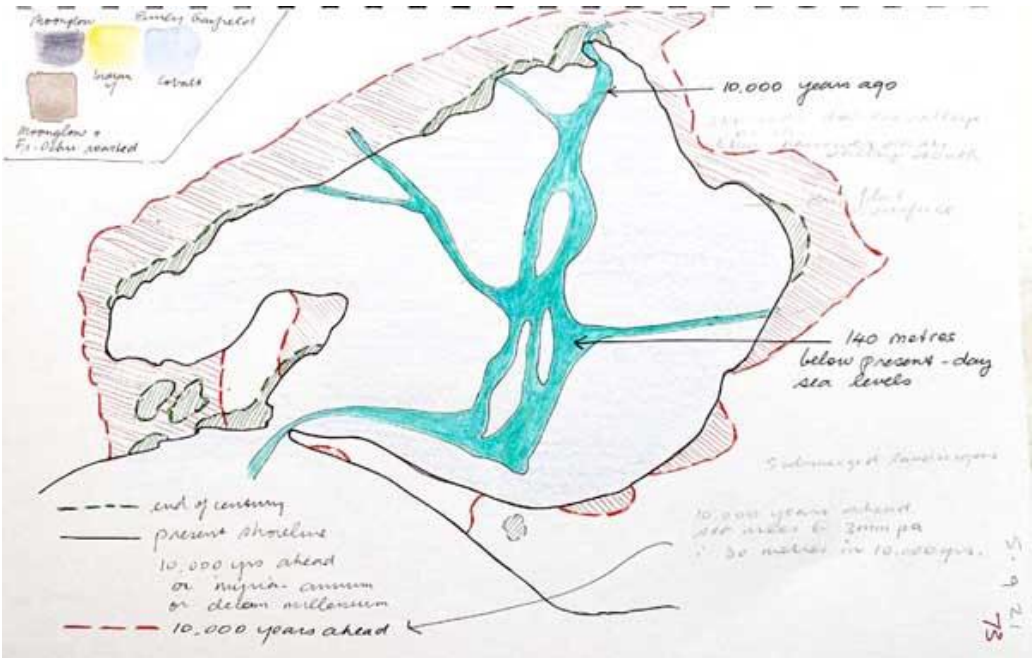


Figure 65: Loi Magill, *Impression of differing sea levels of Port Phillip Bay*, (2021)

An additional investigation to replicate the topographic three-dimensional area of Port Phillip Bay was experimented with. Beach sand was collected and moulded into the shape of the Yarra River running through dry land, as once told by the Bunurong people of this area. I experimented with kangaroo vellum, firstly, as vellum was the material used to make early maps and secondly the kangaroo vellum represented the kangaroos hunted by those early Bunurong people. I had also previously used this material to make maps in my Masters studies.

After softening a piece of kangaroo vellum in water, it was moulded over the sand formed to replicate the bay and rivers. More sand was laid over the top to fill in the valleys. Two major issues arose with this idea. Firstly, the vellum was of inferior quality and too stiff to mould properly and secondly, because of the combination of

[128] Nepean Historical Society, *The Bunurong People*, https://nepeanhistoricalsociety.asn.au/history/pre-history/#:~:text=The%20Bunurong%20People%20are%20Indigenous,including%20Mornington%20Peninsula%2C%20French%20and, accessed 8 Feb 2024.

wet beach sand and the wet vellum, it did not dry after several days and thus never stabilised (Figure 66).

I returned to this idea using folded paper towels and moulded it to create the topographical shapes. The wet vellum was laid over the paper towels and five kilograms of rice poured over the vellum to weigh it down. This idea proved to be better, in that it dried, but the quality of the vellum spoiled the overall effect. Finally, after this testing, I thought I would try one last idea using a heat gun on vellum to attempt at making topographical indentations using a scrap piece of vellum left over from previous work. This produced the effect I was after, because using the heat gun directed at the unusually stiff piece of vellum, I was able to manipulate the folds and troughs to give a better result, which is shown in Figure 67. After trialling the three-dimensional topographic works in a variety of ways, I decided to abandon this idea, mainly because the piece of vellum was inferior and hard to work with, and I was not convinced that the final outcome was what I wanted. The use of vellum could also be considered unethical because contextually, even though the idea of using kangaroo vellum[129] to map this area seemed a natural choice of material, since ancient maps had been drawn on vellum as far back as BCE and it also referenced the kangaroos once hunted in this area, using animal skins in art could be interpreted as 'controversial'.[130]

In cartographic maps there are symbols that delineate height above sea level, but in some of my 'maps', they are there to enhance the abstract or decorative nature of the map, but in no way represent heights above sea level. The following images show the steps referenced above and the final version.

[129] NOTE: A brief history of vellum forms part of this section to show its historical value and its current use within the context of contemporary art. The term *vellum* comes from the French *veau* and refers to a parchment made from calf skin and often coated to make the surface exceptionally smooth. In my Master's research, much of it was centred around Fra Mauro's World Map of 1459 drawn on ox vellum. Vellum to this day is the preferred support for botanical artists, and not to be confused with paper vellum, a different product entirely.

[130] W. Coleman, R. Scollen, B. Batorowicz, & D. Akenson, 'Artistic Freedom or Animal Cruelty? Contemporary Visual Art Practice That Involves Live and Deceased Animals'*, Animals (Basel)* (2021) Mar; 11(3): 812, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7998353/, accessed 27 Nov. 2023.

Sand from Port Phillip Bay

Moulding sand to shape of Bay

Soaking a pre-loved piece of vellum

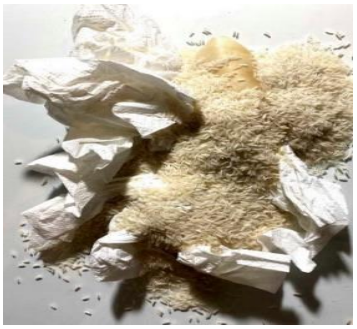
Wet vellum on sand mould

Covering with wet sand

Vellum not dry after several days

Moulding sand

Covering with sand



Remoulding with paper and rice

Dried vellum

Painted vellum

Figure 66: Loi Magill, Three-dimensional experiments with vellum (2021)

Figure 67: Loi Magill, Testing with a heat gun on vellum to create topographical features (2021)

Turning my attention to two-dimensional works on a variety of material surfaces, I produced several abstract versions of Port Phillip Bay, some on cartridge paper, watercolour paper and Mylar[131]. Using my abstract shapes of Port Phillip Bay, Figure 68 to Figure 69, and referencing the American artist Deanna Lee, (Figure 42) whose work shows natural systems such as waves, wind currents, geological strata and topographical maps, I have adopted her aesthetic strategy to show as contour lines on my maps. The following images are the results.

[131] NOTE ON MYLAR – See Appendix D.

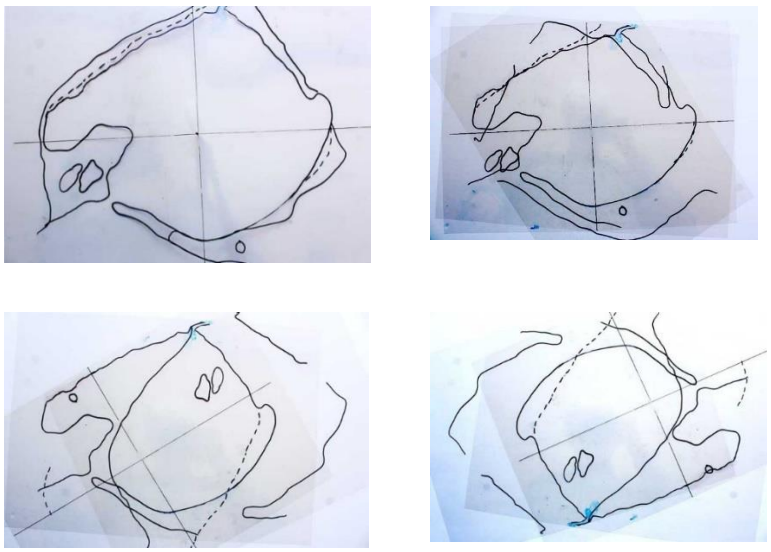


Figure 68: Loi Magill, *Past, present and project coastlines*, (2021), three separate sheets on Mylar rotated to achieve abstract versions

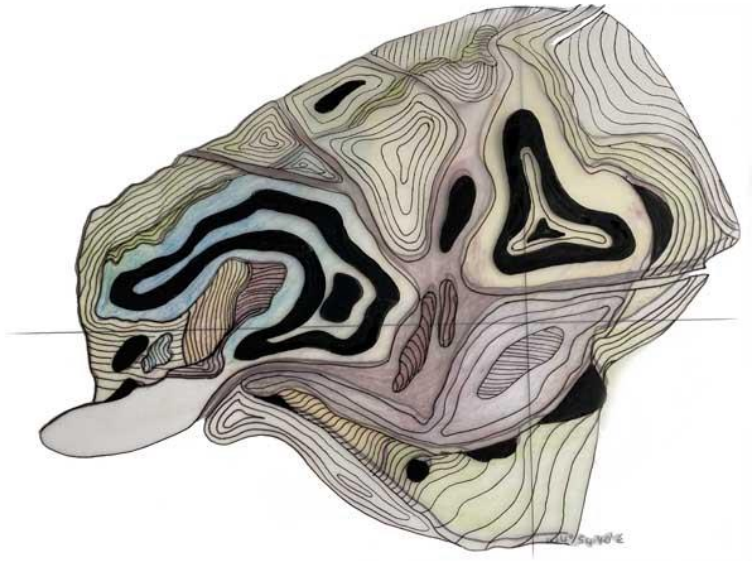


Figure 69: Loi Magill, *First impression of the different sea levels of Port Phillip Bay*, (2021), watercolour pencil on Mylar[132].

[132] NOTE ON MYLAR – See Appendix D.

Figure 70: Loi Magill, *Second Impression of the different sea levels of Port Phillip Bay*, (2021), ink on cartridge paper

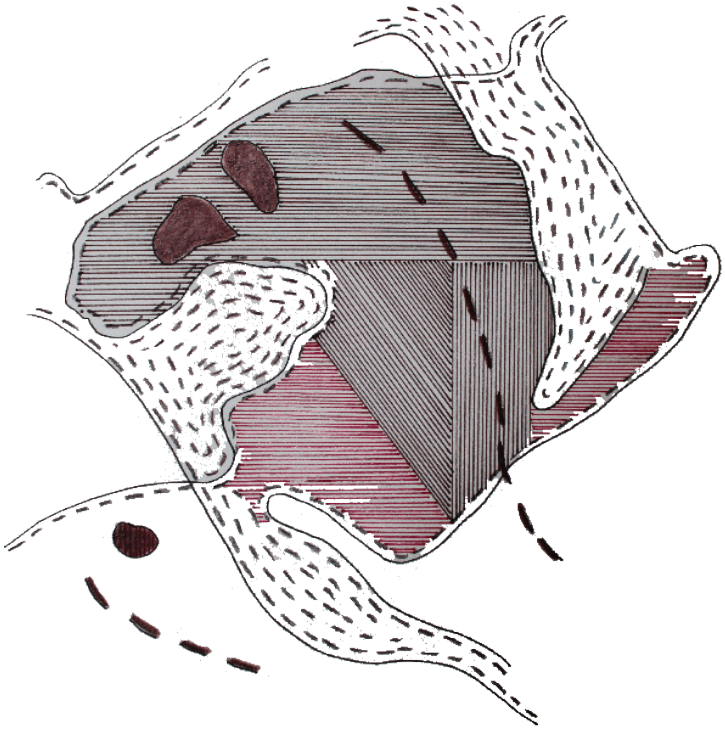


Figure 71: Loi Magill, *Fourth impression of the different sea levels of Port Phillip Bay*, (2021), ink on cartridge paper

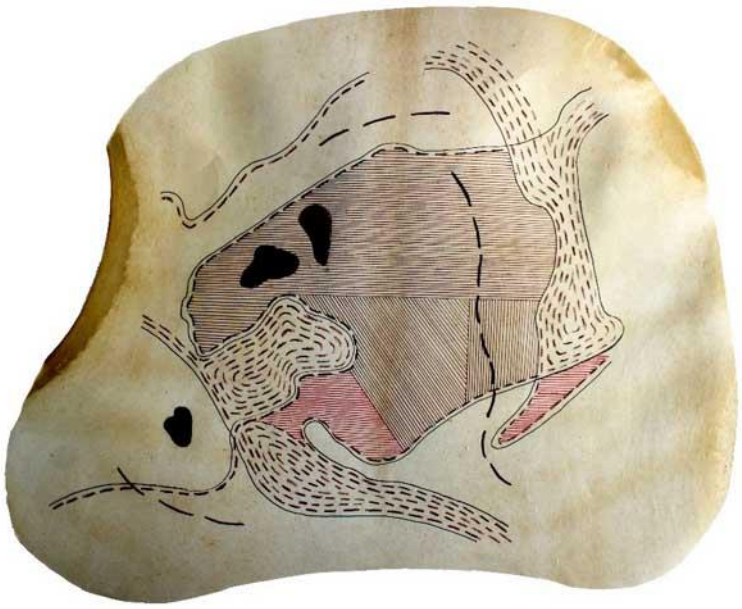


Figure 72: Loi Magill, *Fifth impression of the different sea levels of Port Phillip Bay* reproduced on Vellum, (2021), ink on vellum

Figure 73: Loi Magill, *Impression of the Yarra River flowing through the 'once dry' Port Phillip Bay,* (2021), pen, alcohol ink on Mylar[133]

[133] NOTE ON MYLAR – See Appendix D.

Figure 74: Loi Magill, *Sixth impression of the different sea levels of Port Phillip Bay*, (2021), ink on vellum

I concluded that the research of the shorelines of Port Phillip Bay that had been taken over a period of six months was not sustainable over the course of a three-year doctorate.

3.2 The Antarctic

The Antarctic, while not part of the Australian continental landmass, is considered partly an Australian territory with over 5.9 million square kilometres, or 42% under Australian sovereignty. For this reason, it fits within the purview of this project. The other, more pertinent reason is its location being due south of Port Phillip Bay, the object of the previous study.[134] The Antarctic, as an area of research is constantly being monitored by NASA[135] which tracks the melting ice levels regularly and could be a future cause of sea levels rising in Port Phillip Bay.[136] NASA reports that Antarctica is losing ice mass (melting) at an average rate of about 150

[134] NOTE: In fact, Mawson's Hut is located directly south of Port Phillip Bay as it happens.
[135] NASA Global Climate Change, Vital signs of the planet, 'Ice Sheets', 2002, https://climate.nasa.gov/vital-signs/ice-sheets/, accessed 8 Feb 2024.
[136] M.M. Ibanez, The Antarctic ice sheet is melting: And this is bad news for humanity. World Economic Forum, 2023. https://www.weforum.org/agenda/2023/03/antarctic-ice-sheet-is-melting-humanity-climate/#:~:text=A%20new%20study%20shows%20the,metres%20in%20the%20distant%20future

billion tons per year, and Greenland is losing about 270 billion tons per year, adding to sea level rise.[137] The process will take decades probably beyond the end of this century. If left unchecked, the complete melting of the West Antarctic ice sheet would cause a global sea level increase of 3.3 metres in the distant future.[138] This raises concerns for the future of low-lying populated areas. I decided to spend some time researching this idea as it could potentially influence the shorelines of Port Phillip Bay.

The research produced some useful data. Ice cores drilled in Antarctica show how it has changed from when it had a sub-tropical climate during the early Eocene, to its current state, cooling down slowly over many millions of years.[139] Large icebergs have broken away over the years, with some as large as Hawaii and Paris. They are so numerous they are given numbers for tracking by satellites. For example, a giant iceberg A68A (Figure 75) has been monitored from space and reveals that 152 billion tons of fresh water, that is equivalent to 61 million Olympic sized swimming pools, entered the sea around the island of South Georgia. This iceberg travelled 4,000 kilometres across the Southern Ocean.[140]

[137] NASA Global Climate Change, Vital Signs of the planet, 'Ice Sheets', 2002, https://climate.nasa.gov/vital-signs/ice-sheets/, accessed 8 Feb 2024
[138] M.M. Ibanez, The Antarctic ice sheet is melting: And this is bad news for humanity. World Economic Forum, 2023
[139] T. Bauska, 'Ice Cores and Climate change', *British Antarctic Survey* (30 June 2022), https://www.bas.ac.uk/data/our-data/publication/ice-cores-and-climate-change/, accessed 10 Nov. 2022.
[140] University of Leeds, 'Satellites reveal world's most famous 'mega iceberg' released 152 billion tons of fresh water into ocean as it scraped past South Georgia'. *Science Daily* (19 Jan. 2022), https://www.sciencedaily.com/releases/2022/01/220119194240.htm, accessed 16 Oct. 2022.

A satellite image of the A68 iceberg published by the European Space Agency (ESA) © contains modified Copernicus Sentinel data (2020), processed by ESA, CC BY-SA 3.0 IGO

Figure 75: *Iceberg A68A from satellite imagery*, (2020), https://www.lifegate.com/a68-iceberg-melted

Today, A68 has almost completely melted away, breaking up into smaller fragments which the US National Ice Centre no longer monitors.[141] An early work ensued from this research by freezing different layers of ice, colouring them with watercolour paint (Figure 76). My intention was show in a way not too dissimilar, a reduced scale model of ice melting over time as occurs within nature.

[141] M. Girola, 'We've lost A68, the world's largest iceberg' (21 Apr. 2021) https://www.lifegate.com/a68-iceberg-melted, accessed 6 Nov. 2021.

Figure 76: Loi Magill, *A simplified version of the ice-melt* (2021)

Although the original pieces of ice were interesting in their three-dimensional state, when melted, I wasn't happy with the result perhaps because the melting process was too messy in the confined space of the studio. Other ideas were tested using different materials such as glass paint on Mylar[142] giving the impression of ice, but contextually inappropriate and not applicable because of the inferred damage of plastics to the environment. As per my cyclic method of working, I decided to return to experiment with sheets of glass and glass paint which gave a beautiful transparent look as though looking through ice to its depth. The same could be said for the use of acrylic ink on glass which dried well but also depended on the thickness of the paint as to its transparency. The photographs of the experiments on glass would have to be professionally printed (an idea which I returned to much later as

[142] NOTE ON MYLAR – See Appendix D.

described in Chapter 4). I also experimented with photographing the ice in stages of melting, as a way of simulating the melting ice sheets of Antarctica. Those photographs would then form part of the submission of artworks. I eventually reasoned against this idea, as the photographs were not up to standard, some having shadows running across them, depending on the time of day and how it affected the lighting in the studio.

I did consider other ways that I could exhibit paintings of the sea ice melting and one was to produce three versions on acrylic sheets. I had purchased these early in the research cycle without considering their environmental impact. This was a time when the focus of the research was on the role of mapping areas of change. Once the research focus shifted to environmental concerns, the ethical implications of this material became apparent. However, since I already acquired the materials, I decided to see if I could replicate the melting by installing them, one in front of each other. The purpose of this was to see if I could achieve the three-dimensional depth of looking into or down onto the ice. Figure 77 shows some of the sketches to this effect. I reverted to some trials with watercolour, *Antarctic ice shelf breaking away* (Figure 78) contextually this fitted with the melting ice, as in the water flowing off the ice and the paint flowing off the brush.

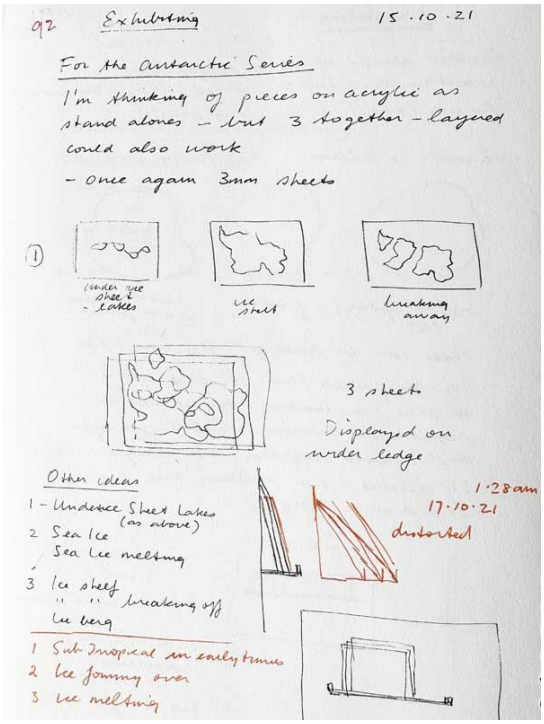


Figure 77: Loi Magill, Ideas for layering panels, Visual Diary 2, page 92

Figure 78: Loi Magill, *Antarctic ice shelf breaking away*, (2021), watercolour on watercolour paper, 76 x 56 cms

Even though I had considered the use of Mylar[143] inappropriate because of the inference of its non-biodegradabilty, I did want to see the visual effect. Using two

[143] NOTE ON MYLAR – See Appendix D.

pieces of Mylar overlapping each other, the piece behind shows only the coastline while the overlay shows the ice breaking away from the mainland and the broken areas of sea ice floating away. These were painted with glass paint, *Sea Ice* (Figure 79) which when dry, gives the impression of shiny ice. Once again, I felt there was only so much that could be mapped in Antarctica, fearing that there would be a 'sameness' to any other maps that I would produce. I decided to further my research into other parts of Australia.

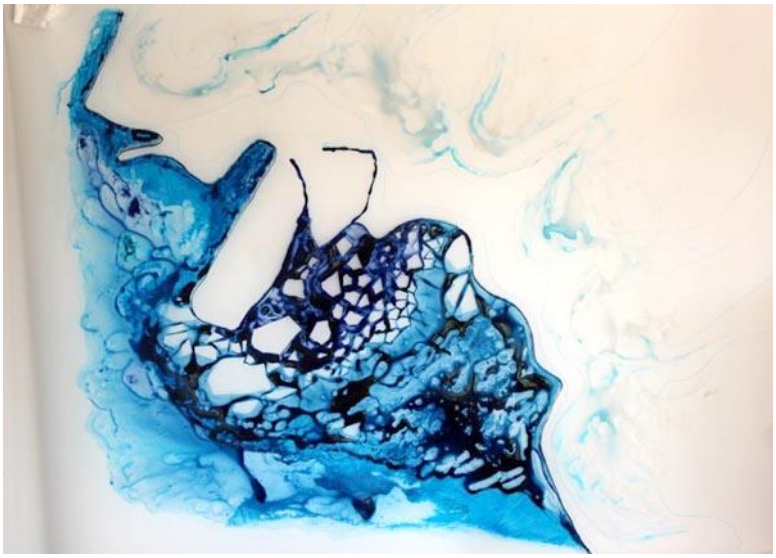


Figure 79: Loi Magill, *Sea Ice*, (2021), glass paint on Mylar

3.3 The Ord River Scheme

I researched other places in Australia that had changed landforms, and these included the Ord River scheme. The Ord River in Northern Territory was dammed to capture much of the 2500 gigalitres of water that flowed into the ocean each day during the wet season storms (enough water to supply Perth for 10 years).[144.] The first section, the Kununurra Dam was completed in 1963, and a further dam, the Ord River Dam, also known as Lake Argyle, was completed in 1972. Later in 1990 a hydro-electric power station was built. A farmed area of 12,500 hectares would then be increased to 45,000 hectares (which translates to 450 square kilometres).

[144] Water Corporation, 'Ord River Irrigation Scheme' (2022), https://www.lakeargyle.com/history-statistics-environment/ord-river-irrigation-scheme/

Compared to the land size of Australia, over 7.5 million square kilometres, this does not seem much, but to focus on just that one area and reflect upon the huge amount of damage to flora and fauna, the change in landforms, together with damage caused by mining, tailing ponds, road making and clearing for agriculture, cities and so forth, the damage is quite substantial.

I investigated these changes in the studio, by using layers of glass which, (Figure 80) when seen through, gave an impression of changes over time. Materials such as sand that I had saved from my outback travels, which reflected those distant areas, alcohol inks, water and alcohol were used in the testing process. Other artwork on rice paper was to contextually refer to the rice grown in that area on a commercial scale[145] from 1973 to 1983, peaking in 1982 and was one of the main reasons for expanding the Ord River. As well as sand and rice paper, the textile calico was also used, also to reference the fact that cotton was another industry of the Ord River scheme and is still in production.[146]

I realised after these experimental works that it was not sustainable over a three-year doctorate study but even so, I found those early trials to be beneficial as far as reflecting on my ways of working and the indirect reference to my later works on the toxicity of mining and the downsides of land clearing, such as dust pollution, possible erosion and destruction of animal habitats and ecosystems.

[145] S. Sivapalan, 'Rice in the Ord River Irrigation Area', Department of Primary Industries and Regional Development, (2017) https://www.agric.wa.gov.au/grains-research-development/rice-ord-river-irrigation-area#:~:text=Rice%20was%20grown%20on%20a,constructed%20to%20process%20the%20crop, accessed 27 Nov. 2023.

[146] T. Slaven, 'Cotton in the Ord River Irrigation Area', Department of Primary Industries and Regional Development, (2017), https://www.agric.wa.gov.au/cotton/cotton-ord-river-irrigation-area, accessed 27 Nov. 2023.

Outback sand, alcohol inks on three layers of glass

Rice was grown in that region – inks on rice paper

Another version of Ord River – outback sand and inks on glass panels

Cotton is grown in this area – my version of the Ord River (part) on cotton calico with watercolour

Figure 80: Loi Magill, Series of trial maps for the Ord River (2021)

3.4 Lake Bungunnia

The discovery of the now extinct mega-Lake Bungunnia was an exceptional find but would not have sustained a three-year investigation for this Doctor of Creative Arts program. Instead, it led to a further and much larger investigation, since it was part of the Great Artesian Basin and earlier, part of the Great Inland Sea which is covered more fully in Section 4.6.

Lake Bungunnia was researched between November and December 2021, with the aim of trying strategies to artistically represent an area that no longer existed. When considering the overall work, the original thought was to include these

panels into the artwork of the Great Inland Sea, which happened much later. This idea was abandoned as the scale of this painting would be too large for the intended future work, but it did appear in my early trials and experiments for this doctoral research.

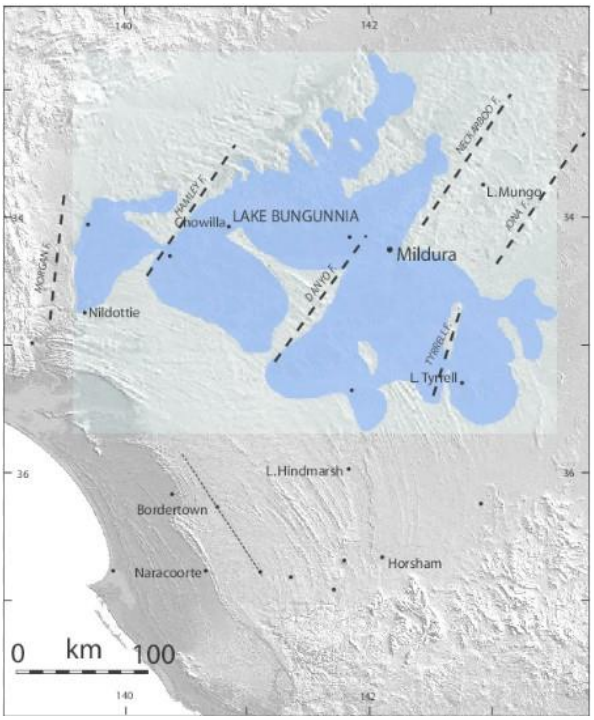


Figure 81: *The now extinct Lake Bungunnia* (in blue) https://www.researchgate.net/figure/elevation-diagram-showing-lake-bungunnia-near-its-maximum-extent-coincident-with-the-60-m_fig7_279574736

This extinct lake (Figure 81) covered an area of over 40,000 square kilometres, which encompassed a large part of the Murray-Darling Basin some 2.5 million to 700,000 years ago. I researched this idea since it was a substantial change in landforms and one of which there was a considerable amount of data. I felt this could possibly be the subject for the final project. However, as I have discovered, in practice-based research, there never seems to be a final solution, the research and practice always leads to more projections and ideas, as well as many issues to earlier thinking and making. Some of the artworks that were produced for this idea are found below, (Figures 82 & 83).

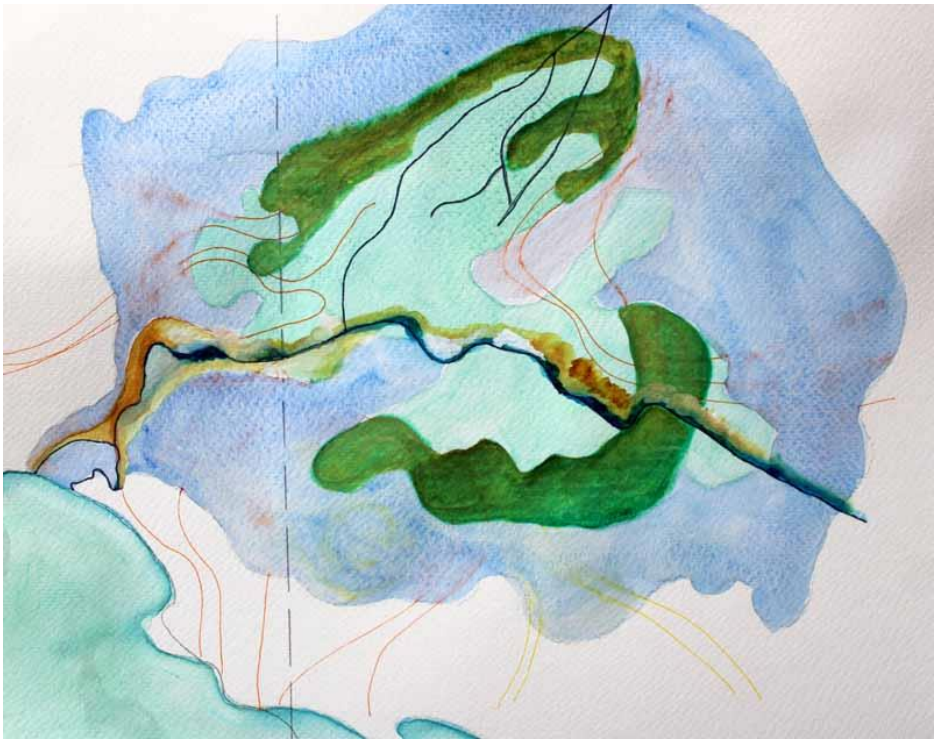


Figure 82: Loi Magill, *Lake Bungunnia*, (2021), watercolour on cartridge paper

Figure 83: Loi Magill, *Lake Bungunnia*, (2021), watercolour and pen on watercolour paper

The completed version of Lake Bungunnia, (2021) (Figure 84) was arranged on six canvas boards.

Figure 84: Loi Magill, *Lake Bungunnia*, (2021), oil on canvas, 6 canvas panels, 60 X 90 cms.

3.5 Mining activity

Mining activity over time has altered the land in many ways such as the actual diggings, clearing the land, altering water courses, changing the land beneath the surface, tunnels that go far below sea level, as well as the pollution emitted into the atmosphere damaging wildlife and plants. There are over 350 working mines in Australia and over 80 thousand abandoned mines.[147] On a trip to Queenstown, Tasmania and having seen first-hand the horrific damage that has been done to the landscape there, I felt this should be recorded, and might yield ideas for more creative responses. In 1885 in Queenstown, copper, silver and gold mines, commenced operation. Before newer, less environmentally damaging ore-treatment methods were introduced in 1952, the surrounding hills were stripped of their timber for fuel. Fumes emitted from the smelter killed whatever vegetation remained, and this, coupled with erosion, left a lunarlike landscape around the town.[148] To give an example of what I would call 'Altered States' are these images of the polluted Queen

[147] International Trade Administration, Country Commercial Guides, Australia-Country Commercial Guide,'Mining' 2024, https://www.trade.gov/country-commercial-guides/australia-mining, accessed 8 Feb 2024.

[148] Editors of Encyclopaedia Britannica, 'Queenstown', *Geography and Travel* (15 Apr 2016), https://www.britannica.com/place/Queenstown-Tasmania-Australia, accessed 3 Feb. 2023.

River in Queenstown (Figure 85) and the deforestation of the surrounding land (Figure 86). The copper mining in that area produced the colours in the river. It looks aesthetically stunning until one reflects on what chemicals and other runoff is causing the orange hue that is so pleasing to the eye.

Figure 85: *The polluted Queen River converging with the King River, Queenstown, Tasmania*. https://www.exploroz.com/places/267820/tas+king-river-queen-river-confluence-walking-track

Figure 86*: Deforested land around Queenstown Tasmania*
https://www.discovertasmania.com.au/places/west-coast/queenstown/

The following investigation of mines and their tailing ponds reminds us of the dramatic ways in which humans have altered the natural environment. Open pit mining alters landforms and has severe consequences for the surrounding area. One of the major problems is that the dust generated by the mining process deposits on plants and so reduces a plant's capacity for photosynthesis. This dust can also enter the higher levels of the atmosphere and be transported great distances.[149] These areas are symbolically shown in black on the submitted paintings, see Appendix B to signify the damage done to the surrounding area.

Google Earth searches showed the Glenshera Silica Mine in South Australia and the 'Altered States' of the tailing ponds Figure 87 and 88). When magnified on Google Earth, it shows the cracked surface which I replicated onto two sheets of Mylar[150] to show that surface aesthetically (Figure 89). The use of Mylar gave the

[149] Turner, G.F., 'Vulnerability of Vegetation to Mining Dust at the Jack Hills, Western Australia', PhD thesis, University of Western Australia, 2013, https://api.research-repository.uwa.edu.au/ws/portalfiles/portal/4572740/Turner_Gillian_2013.pdf, accessed 5 Jan. 2023.
[150] NOTE ON MYLAR – See Appendix D.

transparency I needed to show the original land before mining and the aftereffects on the overlay.

Figure 87: Glenshera Tailing ponds showing close-up of surface of one of those ponds.

Figure 88: Loi Magill, *Tailing ponds*, 2022, alcohol ink on Mylar

Figure 89: Loi Magill, *Tailing ponds and overlay of original ground*, (2022), alcohol ink and inks on Mylar

Figure 90: Loi Magill, *Close up of tailing pond (shown Figure 88),* alcohol ink on Mylar

The Boddington Gold Mine in Western Australia is the largest gold and copper mine in Australia, eclipsing the Super Pit in Kalgoorlie, and in so doing, cleared 213 square kilometres of native vegetation. This caused the loss and fragmentation of habitat for conservation of significant fauna species and the loss of state forest with conservation values.[151] This was once an area of jarrah forest which was cleared to make way for the mine. To represent those lost forests, an abstract version of the gold mine was painted on a jarrah-stained board (Figure 91). Although the actual artwork was unappealing, the conceptual idea I believe was sound, using jarrah stain on timber to represent the lost jarrah forests, while the gold circular form represented the mine with the associated tailing ponds in light blue. I later returned to this site and others for the final series of artwork discussed at length in Chapter 4.

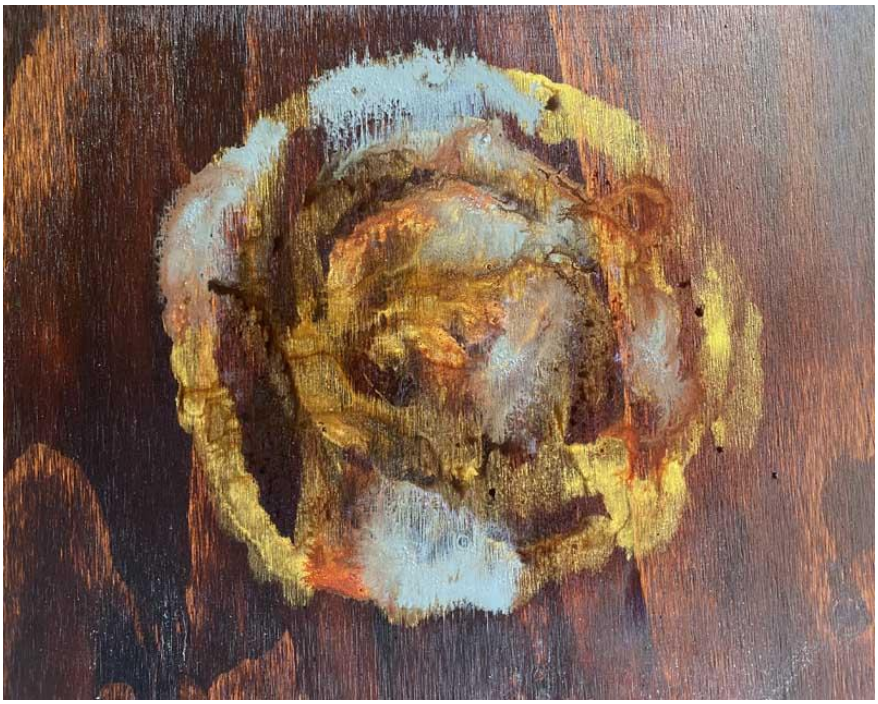


Figure 91: Loi Magill, *Boddington Gold Mine*, (2021), Jarrah stain on plywood

[151] Government of Western Australia, 'Report and recommendations of the Environmental Protection Authority', *Newmont Boddington Gold Mine, Life of Mine Expansion* (Apr. 2014), https://www.epa.wa.gov.au/sites/default/files/EPA_Report/Rep%201506%20Newmont%20Boddington%20PER%20020414.pdf, accessed 9 Jun. 2022.

3.6 The Great Inland Sea

This 'Great Inland Sea'[152] was suddenly of interest, and subsequently pursued, which then became the major focus of the practice part of the research project. The earlier artwork of the extinct Lake Bungunnia that formed the southern section of the Murray Basin, and produced in the studio on six canvas panels painted in oils, became the most south-eastern corner of the new work (Figure 84). This small section of panels referenced the theoretical underpinning of the research, where Lewis Carroll's 'Map of the Empire' was constructed at a scale of one to one, thereby covering the whole empire. While my work was not to this same scale, it conceptually encompassed the idea of a large map. This idea expanded to using 160 canvas panels, each measuring 30 centimetres square to complete the artworks. Using oils as a medium, the extensive drying time between the many layers of oils played an important part, conceptually referring to the amount of time that those land changes had taken. The research zone selected was between Latitudes 20° and 36° South in Australia. The reason for this selection was to keep the research on a narrow focus that I considered, at the time, to be manageable. Additionally, being Australian, it allowed a more direct aesthetic outcome from the relationship with a place I inhabit to be created.

The Great Inland Sea, which was also named the Eromanga Sea, was a sea so vast that it covered one-quarter of Australia during the Cretaceous period. The size of the sea generated the idea to create an artwork that would replicate this large sea, into what I envisaged to be a wall map. Not having attempted anything so large before, I wondered where to begin. To establish how large I could make the map, I queried the size of the gallery walls from the Curator at the University of Southern Queensland. A plan of the gallery (Figure 92) was provided and it was from this plan that I envisaged the map of the Great Inland Sea. The largest wall in the gallery was

[152] E. Reynolds, 'The sea that could engulf Australia', *Technology,* (21 Aug 2015), https://www.news.com.au/technology/science/animals/the-sea-that-could-engulf-australia/news-story/c7000a780feb1666fa7382b65464c2c8, accessed 19 June 2022.

715 centimetres wide and 255 centimetres high. I intended to create a map that would be site-specific, 6 metres wide and 2.4 metres high.[153]

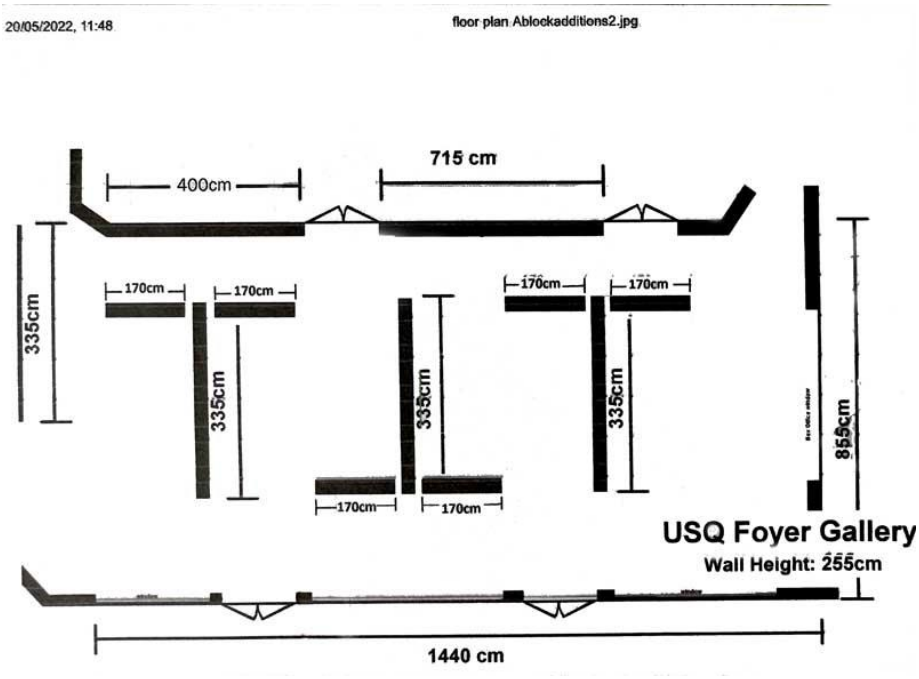


Figure 92: Plan of gallery A Block, University of Southern Queensland

The envisaged map was so large, it took me back to the theoretical works of Lewis Carroll, Korzybski, Borges and Baudrillard, mentioned in Chapter 1, where the Map of the Empire was so large on a scale of one to one that it covered the land it was created for. Therefore, a 'Map of the Empire' seemed to me to be an artistic way to link theory conceptually and contextually to the artwork. This is because the subject matter for my artworks were those parts of Australia where I might be, or had been, at any time. For this reason, the places I had chosen to use as a geographic focus were autobiographical in nature and these locations are my empire, my territory, my maps of those various locations.

[153] NOTE: While it could be argued that the works are not site specific, insofar as they could be moved to another site, the gallery dimensions are addressed in the works because the works are made to respond to the B Block gallery dimensions and the exhibition as a map of the external sites, and through which, I argue, drawing on Baudrillard, those sites are, in a sense, accessed. This point is elaborated in what follows.

From Jorge Luis Borge's *Exactitude of Science* [154]

> In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast Map was Useless, and not without some Pitilessness was it, that they delivered it up to the Inclemencies of Sun and Winters. In the Deserts of the West, still today, there are Tattered Ruins of that Map, inhabited by Animals and Beggars; in all the Land there is no other Relic of the Disciplines of Geography. —Suarez Miranda, Viajes devarones prudentes, Libro IV,Cap. XLV, Lerida, 1658.

Baudrillard is talking largely about hyperspace, but he also considers this in the context of iconography and art, where he states, in 'the age of simulation thus begins with a liquidation of all referentials - worse: by their artificial resurrection in systems of signs'.[155] His claim is that society has replaced reality with a system of signs.

My 'maps' participate in such systems of signs, or perhaps signifiers, without a clear referential signified, save the one I provide in the gallery space and on these pages. The medium varies, but each 'map' I create, precedes, and directs the viewer to, the territory thus mapped. The 'real' site is the referent and motivation for the mapping, not a given fact that is merely represented, or indeed faithfully captured. It is produced in the space that Smithson calls the 'non-site'. But Smithson, unlike some of his peers, had his dialectic of site and non-site, seeing the one site only in relation to the other. Smithson creates 'maps' for his 'non-site' works shown in the gallery. He states 'The map is like a key to where the site is and then you can operate within that sector'.[156] I agree with Smithson that 'the map is the key' but I would say, after

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[154] J. Borges, *On Exactitude of Science. Collected Fictions* (1946), https://kwarc.info/teaching/TDM/Borges.pdf, accessed 1 Aug. 2021.
[155] J. Baudrillard, Simulacra and Simulations, https://web.standford.edu/class/history34g/readings/Baudrillard/Baudrillard_Simulacra.html. Accessed, 20/03/2024.
[156] R. Smithson, *Robert Smithson: The Collected Writings*, Los Angeles, University of California Press, 1996, p.189.

Baudrillard, that it does not open onto the real-world site, but rather *creates* that site through the 'framing' or simulation of it via the maps shown in the gallery site.[157]

But for Smithson, the visitor to the gallery is 'presented with non-world, or what I call a non-site'.[158] Following Baudrillard, I would say that the 'non-site' and maps Smithson shows, are the 'actual' site, and that so called 'real' site, the mine site, is the non-site, since we access it through the map works in the gallery. It is through them that we 'see' the other site. Smithson comes close to the position I hold when he says the 'non-site situation doesn't look like the mine. It's abstract', further adding the dialectic is 'between the abstraction and the site', but I would argue, after Baudrillard, that it is not a choice between the two, or an abstraction of the real, like Mondrian's 'Pier and Ocean' (1915) is assumed to be an abstraction from a presumed real pier and ocean external to it, something Malevich disputed, but rather an abstraction on the same plane as any other abstraction or simulation.[159] My 'maps' lead the gallery visitor to an environmental problem, not a real site.

My conception of the 'map' and the territory, or, the art and the gallery wall, coincides as much as possible. If, as Baudrillard argues, the map creates the territory, and the art, understood as a 'map', in a sense, creates the site to which it refers.[160] We are asked to look at the space as much as the work placed on it. I considered the temporal aspect of climate change and the epochs I'd studied, and upon reflection, it seemed a good idea to consider the temporal aspects of the materials, as I did earlier. The 'map' (artwork) must be biodegradable so it could eventually rot into the ground of that which it mapped, similar to Borges' story of the Map of the Empire This was also in accordance with my decision not to use vellum or Mylar in my final artworks, as mentioned previously because of ethical concerns for the use of animal skins for art supports and environmental issues with the use of plastics. Even so, I have used oil paint on canvas boards, since conceptually the oil

[157] Smithson, p.193.
[158] Smithson, p.189.
[159] Smithson, p.193.
[160] J. Baudrillard, Simulacra and Simulations, https://web.standford.edu/class/history34g/readings/Baudrillard/Baudrillard_Simulacra.html. Accessed, 20/03/2024.

paint relates to those early times when natural pigments were used to create oil paint, well before acrylic paints were invented.

Since the initial artwork on the extinct lake was made up of six, 30-centimetre square panels that gave me the initial start for my calculations. After much sketching and calculating I decided I would need 184 panels of the same dimensions. That would be 23 panels wide and eight panels high. This was far bigger than anything I had tried before, but conceptually it fitted in with Borges' 'Empire'. The disadvantage I later discovered was having to work in two halves in my home studio, the largest space available was 365 centimetres wide. To manage the size of the whole project, I would have to work in two halves. At that time, I could not envisage any problem at all. I purchased 38 panels to start with and the rest were bought over periods of time. Each board was given a light burnt-sienna oil wash as background.

The next step was to 'map out' the Great Inland Sea onto a map of Australia and work out that design onto the panels.

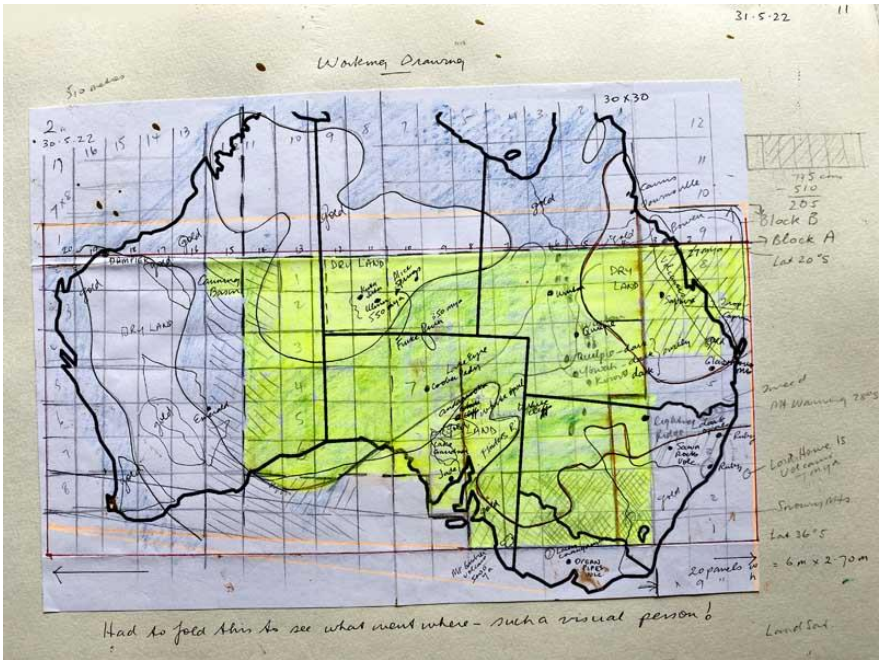

Figure 93: Loi Magill, *Working Drawing*, 2022

Since my work was always intended to be abstract,[161] rather than use the whole map of Australia, I selected an area of Australia so as to be less obvious and concentrated between Latitudes 20° and 36° South. This area was site-specific as it was intended for the longest wall in the gallery in A Block at the University of Southern Queensland.

The first working drawing, (Figure 93) involved research to place on the map what I considered to be changes to landforms, that is to say, where the main mineral deposits were, deposits such as iron ore, gold, silver, lead, opals, uranium and so forth. Geo Science Australia became a great source of information as to where such minerals were to be found and can be seen in the following grid of mineral maps.

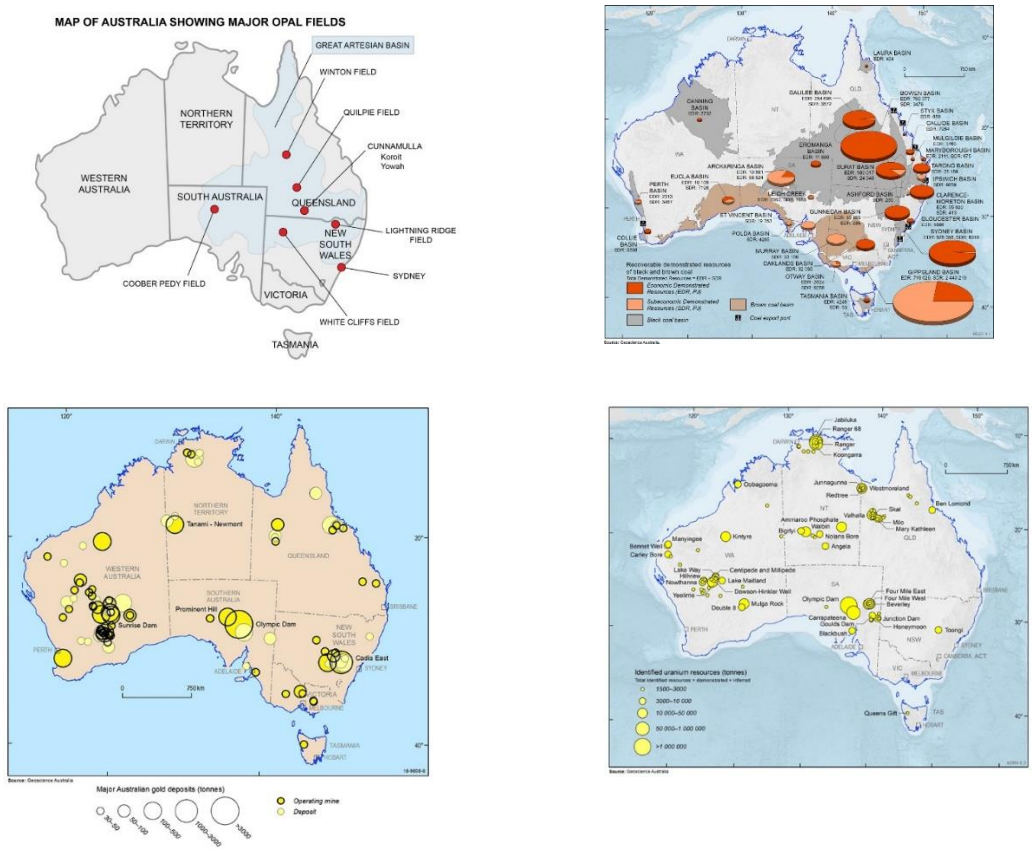

Figure 94: Sample mineral maps from https://www.ga.gov.au/

[161] NOTE: Abstract refers back to my topic ‘Awful Beauty: Mapping Toxic Locations in the Age of the Anthropocene’ and to Baudrillard’s theory of the Simulacra where he suggests that 'there is no longer a real because signs of the real have replaced the real, and in its place is a hyperreal’.

These I pinpointed on the working drawing, (Figure 93) for future reference. First, I had to place the boards on the wall. Having started the map in May 2022, it was not until July 2022 that I decided to remove the six original panels of the extinct lake because of the difference in scale, which I kept as a separate abstract artwork.

Figure 95: Loi Magill, *Studio work in progress, including Lake Bungunnia panels*, (2022)

Another problem surfaced that I had not envisaged and that was to paint the ‘sea’ a blue colour. Each mix of ‘blue’ was slightly different from the last. (Figure 96) so my next research was to find an oil paint that would cover the whole ‘sea’ of approximately 80 boards. I purchased a one litre can of very pale blue ‘low-sheen’ oil house paint that I could apply with a roller. This worked out effectively and looked quite professional, but I could not see ahead how this would engender more problems.

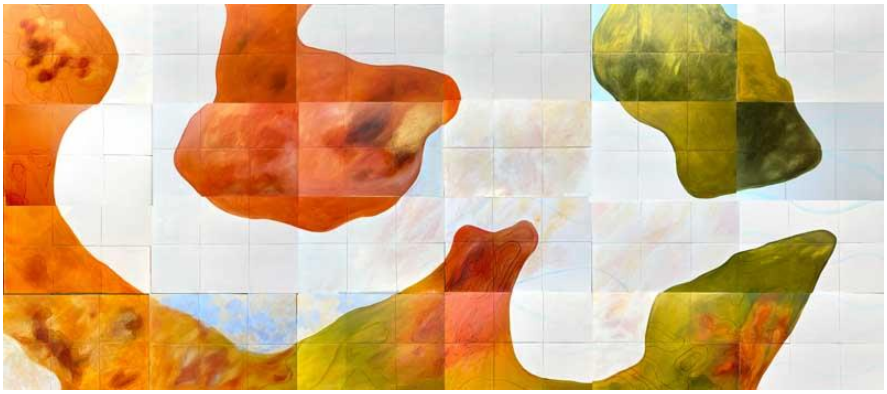

Figure 96: Loi Magill, Two sections combined in Photoshop showing the different ‘blues’ of the sea

Figure 97: Loi Magill, Finished size (compiled in Photoshop) showing the ‘blue’ sea although the lighting in the photographs makes it look a sea of different colours

The main problem was that because it was ‘low-sheen’ no other mediums would ‘stick’ to it. Any layer I tried to paint over it would smear and not go on smoothly. So that became another problem to be solved. I lightly sanded the boards, but this wasn’t satisfactory, it would have needed more than a light sand and I worried that the surface might become damaged. Covering the boards with tissue and/or tracing paper allowed other mediums to adhere, which would also contextually provide another layer of landform changes was another idea I tested. Before trying the tissue paper, I tried scraping off the blue paint, which would have taken months, so I abandoned that idea. The tissue paper was the better option as its finish gave some interesting geographical markings whereas the tracing paper didn’t fold over the edges of the board as well. Other tests were tried, including drilling holes in one of the boards to represent the mines being dug all over the country (Figure 102). This was unsuccessful as the canvas pulled up, making the holes volcanic in appearance, which then had to be sanded back. I discarded that idea also.

Figure 98: Covering in tissue paper

Figure 99: Covering in tracing paper

Figure 100: Scraping off the blue paint was a poor decision as it would have taken months to remove it all.

Figure 101: Covering the blue sea with tissue and washed with raw sienna. The edges I trimmed with a scalpel.

Figure 102: Holes drilled to represent the ‘drilling’ for mines, 2022

Another idea was to search for old news cuttings that reported the testing of the nuclear weapons at Maralinga in South Australia, between 1956 and 1963. I tested this idea with a selection of old newspapers and collaged them to a board to view the effect. I would prefer to have printed these news items on tissue paper, the effect of this was to ‘lose’ the paper and just view the print. This technique was used in earlier artworks which I found to be successful. The use of tissue paper was not successful due to the fact that, having purchased a new printer, the tissue paper would not feed through the printer I did eventually find a way to do this, but much later.

Figure 103: Loi Magill, Collage of old newspapers on canvas board, (2022)

I had the map (Figure 104) printed A0 size (841 x 1188 mm) so I could test different ideas. It was on this large printout that I pasted tissue paper over the ‘sea’. I then painted over that with a light burnt-sienna wash. This idea was interesting to try

but in the end it didn't appeal aesthetically. I want the visual elements and the medium to both reflect the conceptual intention were ever possible, making for a work that signifies on a number of levels.

Figure 104: Loi Magill, Covering the 'blue' area with tissue

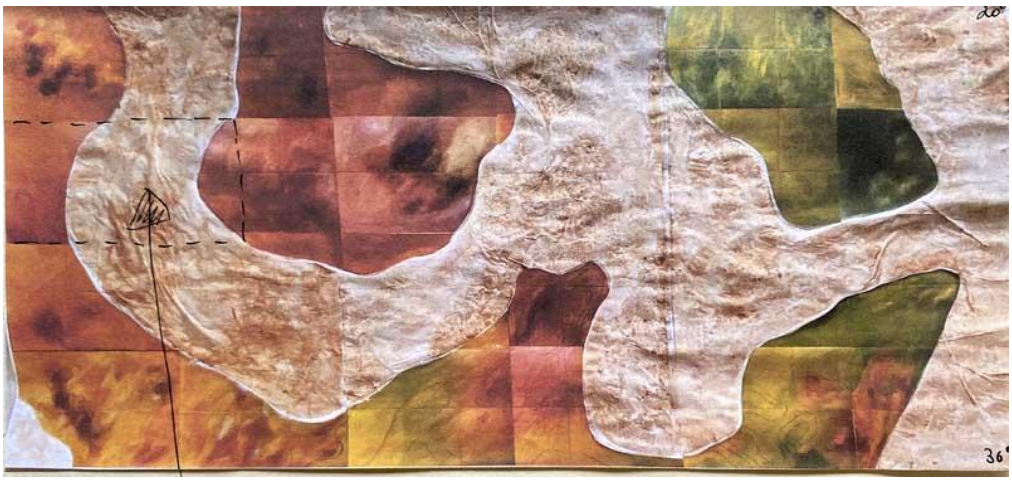

Figure 105: Loi Magill, Painting over the 'blue' area, metaphorically the Inland sea draining away and drying up.

Another problem that arose was associated with the manufacture of the canvas boards. One set of boards purchased was not quite the 30-centimetre square as stated on the packaging and those few millimetres difference between the sizes of the individual boards meant that when placed on the wall, the edges did not match, and the grid structure was out of line. These discrepancies made a large difference to the overall layout.

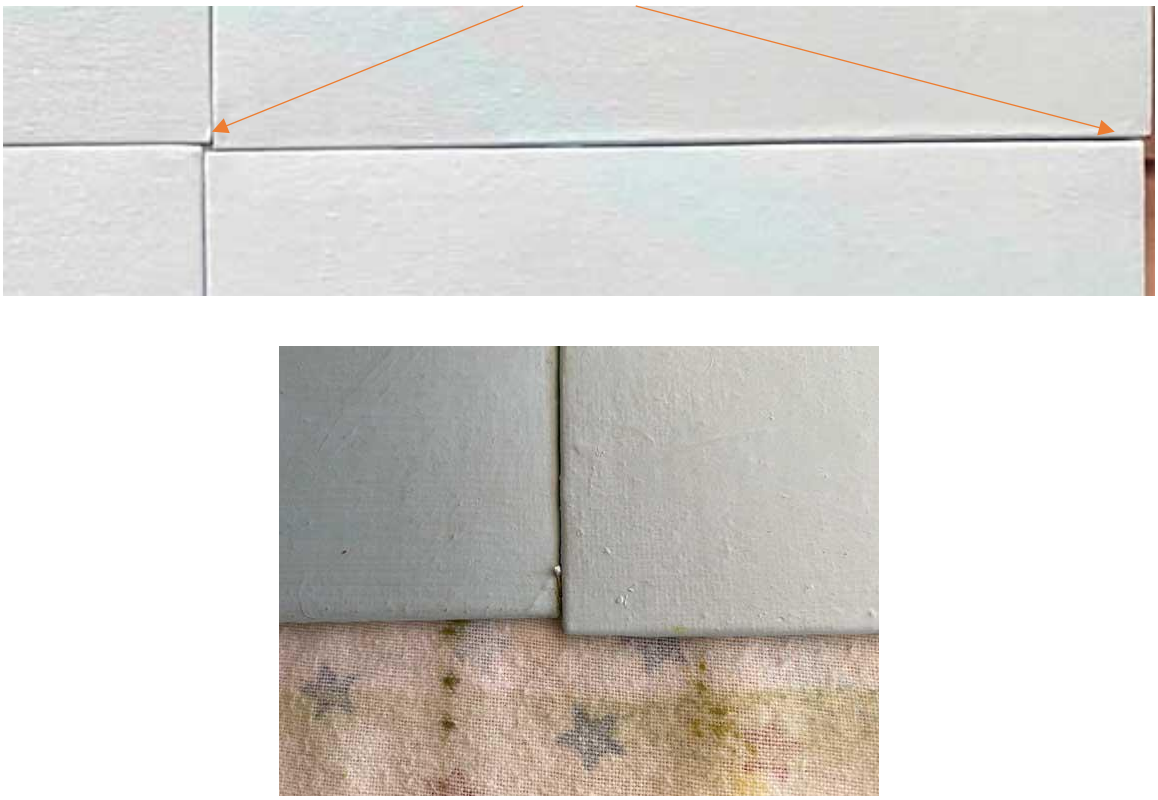

Figure 106: Edge discrepancies between the boards

At that stage, I had envisaged them as one large painting with no gaps between, in a manner not dissimilar to a large work by Tillers. A solution presented itself. If I separated each board by about half a centimetre, this might alleviate the problem. I tried this idea with a black and white background, both of which I thought acceptable however I could not imagine the wall in the gallery being painted black.

Figure 107: experimenting with different backgrounds

By the middle of July 2022, I was rather disillusioned with the whole project because I could not envision the outcome, mainly because of the envisaged size of the proposed artwork and not being able to actually install the artwork in my home. I wondered about taking a totally different approach and I returned to some prior research into the work of other artists to see if there was something that might inspire me or engender other ideas. Paul Klee's geometric works were of interest because of the physical use of small boards arranged together, much like my earlier attempt, but more importantly was the symbolic features of Klee's work which are usually features of maps. To Klee, such motifs conveyed his philosophies and other conceptual interests directly onto canvas, which upon reflection, was what I was endeavouring to do with my work. Klee's *Ancient Sound Abstract on Black*, 1925, (Figure 108) was a captivating block of luminous colours and I wondered if this luminosity could be applied to my panels.

Klee painted his first pure abstract in 1914 which was composed of coloured rectangles and a few circles. The coloured rectangle became his basic building block, what some scholars associate with a musical note, which Klee combined with other coloured blocks to create a colour harmony analogous to a musical composition. His selection of a particular colour palette emulates a musical key.

Sometimes he used complementary pairs of colours, and other times “dissonant” colours, again reflecting his connection with musicality.[162]

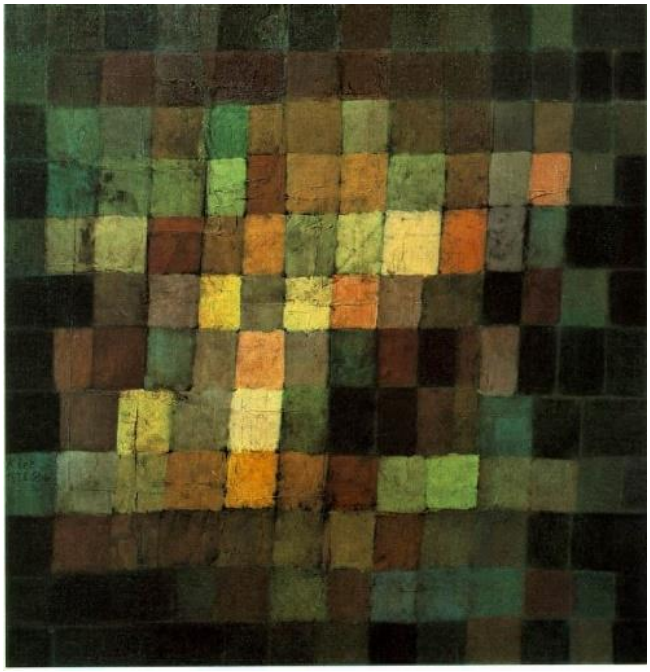

Figure 108: Paul Klee, *Ancient Sound Abstract on Black*, (1925), Kunstsammlung https://gallerix.org/storeroom/1543098160/N/808926984/

I tried a quick sketch (Figure 109), with watercolour pencils using a grid of ten by eight boards which would represent half the entire envisaged artworks. I thought that this trial might fit with Baudrillard’s fourth order of the Simulacra, ‘where this is a pure simulation and no relationship to reality whatsoever’[163] or the map creating the territory rather than representing a fixed and accepted real. I hesitated, however, because I felt it was so alien from what I had envisaged the end work to be at the start of the process. On reflection, it was unclear to me just how the final work would emerge and so I eventually abandoned that idea. In hindsight, it would have been more beneficial to set the idea aside, possibly to revisit later, so it could provide a path to a new idea, if necessary, as per the research methodology. The research methodology I had been deploying up to that point involved the development of new ideas from the current work, including its problems, rather than breaking and starting

[162] S. Rewald, ‘Paul Klee (1879-1940)’*, Department of Modern and Contemporary Art, The Metropolitan Museum of Art, Heilbrunn Timeline of Art History: Essays* (Oct. 2004), https://www.metmuseum.org/toah/hd/klee/hd_klee.htm, accessed 2 Apr. 2022.
[163] Baudrillard,J., *Simulacra and Simulation* (University of Michigan Press, 1994), https://www.google.com.au/books/edition/_/9Z9biHaoLZIC?hl=en&gbpv=1&pg=PA1&dq=Baudrillard,J.,+Simulacra+and+Simulation+university+of+Michigan+Press, accessed 7 Oct. 2021.

anew. I suspect that is why I did not complete the work. This idea is covered in Section 3.6.

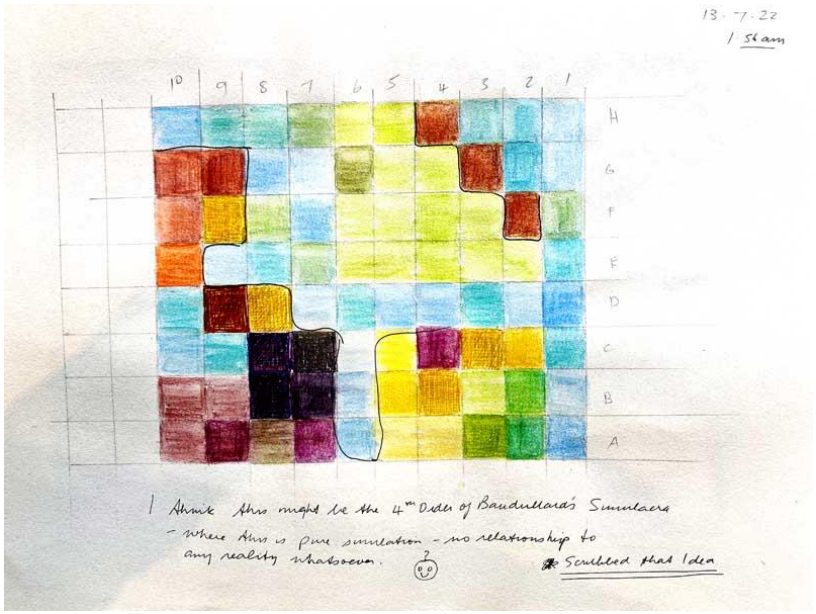

Figure 109: Loi Magill, Sketching ideas of how the inland sea might look like using coloured panels after Paul Klee.

Returning to the previous idea of working with 20 boards by eight, I had originally counted the extinct lake artworks on six boards as part of the whole. Since this painting was to be a separate submission, either six more boards had to be purchased or the whole cut down overall to 19 boards wide, in other words 30 centimetres less in width. Knowing I had my background in place, my idea was to show changes to landforms by hanging large sheets of Mylar[164] in front of the background. I had previously experimented with this idea on Mylar, addressing the topic of the Glenshera Silica Mine in South Australia.

During a university seminar a discussion took place over the choice of materials used in some of these works in particular the use of vellum, questioning the ethical use of animal skins in art, which also made me think about the choice of Mylar[165] (plastic-based) and my developing interest in the Anthropocene, which would be in conflict with my emerging understanding of the way materials signify. Of course, in some instances, it can cause actual environmental problems such as with

[164] NOTE ON MYLAR – See Appendix D.
[165] NOTE ON MYLAR – See Appendix D.

the manufacturing and disposal issues. I discarded this idea and the use of plastic Corflute boards and searched for other ways to complete the artworks. Reflecting on other ways of continuing and looking at materials that would not harm the environment, I chose to try watercolours on large sheets of watercolour paper which could replicate the grid-style of the canvas boards. I chose one section of the Great Inland Sea and worked on six sheets of watercolour paper (Figure 110). These I put aside to think about while I decided what to do with the canvas boards.

Figure 110: Loi Magill, *Landforms and the Inland Sea,* (2022), watercolour, 6 sheets 76 x 56 cms each

By the middle of August 2022, I was still having difficulty visualising the six-metre-wide artwork.[166] Being a visual thinker, I decided a better solution would be to reduce the whole project down to a manageable size where I could see it, and eventually resolved the problem with a better solution which, as it turned out, was to reduce the size allowing the whole 'map' to be installed on the wall in my studio. This helped me to visualise the complete work. In September 2022, I discarded the boards with the blue paint, reducing the size of the artwork, which then covered the large wall in the studio. By re-drawing the whole map again, it measured 3.5 metres by 180 centimetres.

[166] NOTE: Since my wall at home is only three-and-one-half metres wide, I could only display half of the boards at a time which made it difficult to visualise a six-metre-wide painting. When I started the project, it did not occur to me that this would be a problem. I partly got around it by photographing all the panels and putting them together in Photoshop, but it still was not what I wanted.

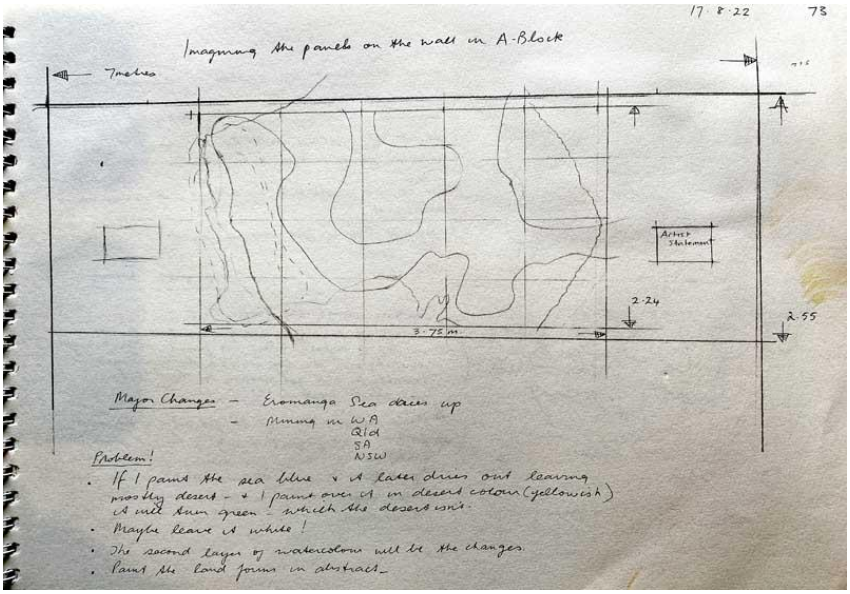

Figure 111: Loi Magill, Sketch showing the size of the gallery wall in A Block with the pared down version, including room for Artist's Statement and other submissions.

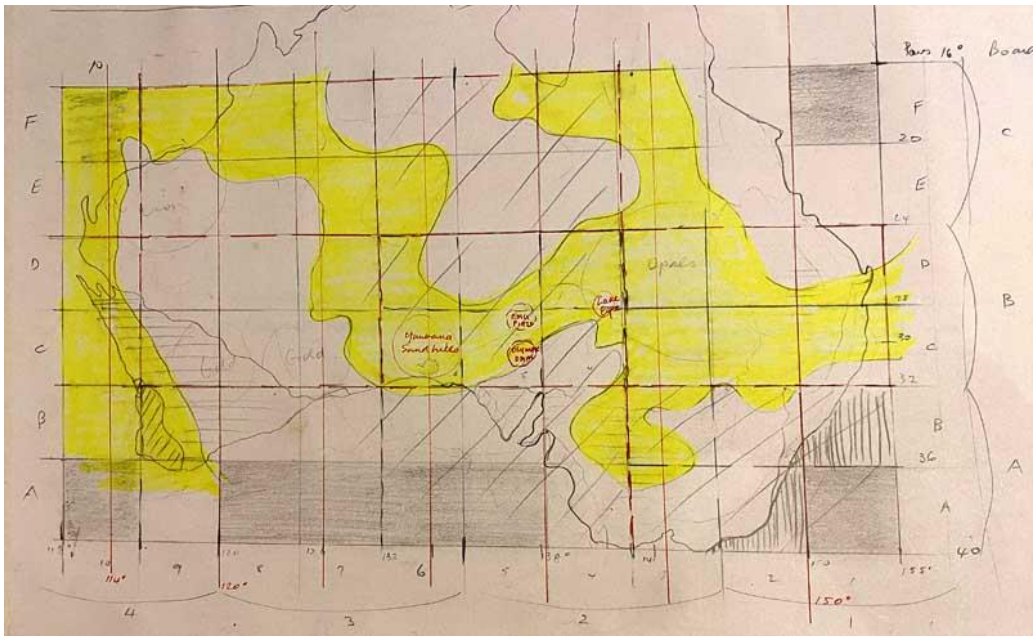

Figure 112: Loi Magill, the new size showing the coastline of Australia which is the later change in landform after the Inland Sea dried up.

Figure 113: Loi Magill, *Outline of Australia*. The Inland Sea painted in gold to contextually allude to the many minerals deposited when the sea drained away.

By the beginning of October 2022, I covered all the remaining boards in tissue paper, which gave a topographical and bathymetrical effect to the boards, which drew on the conventions of mapping elevation and depths of landforms. Even so, I was not confident that this was the outcome I wanted, possibly because my original desire was to have an abstract map, which this was plainly not. It was obviously a map of Australia. Was this leaning too far towards traditional forms of representation of a given referent? But what was apparent was that there should be a one-half-centimetre gap between all the boards to alleviate the earlier problem of the slight differences in the size of the boards, as discussed earlier, but also to highlight the simulation or highlight the 'construction' of Australia through the mapping of it from various points of view. 'Australia' is a territory created, to some extent, by its mapping, from early imagined land – the 'great southern land' – to the land mapped by the First Peoples according to shared culture, customs, laws and language, as shown in the AIATSIS map mentioned above in Section 1.3.

Several artists have used grid patterns with spaces in between, US artist Derek Lerner, mentioned earlier in Section 1.4, being one. Not only did this alleviate the problem of the different board sizes mentioned earlier, it also gave me pause for thought about the way a country or territory is 'carved up', sometimes in radically different ways, showing different 'ways of seeing' the same thing, that is, the

mapping of the territory in different ways, according to different cultural needs.[167] I decided to leave this for a while and give myself time to think on it, as it has significant political and cultural implications that, a full treatment of which, would shift the focus of the project significantly, and it was deemed unwise to pursue further at this late stage.

3.7 Projection works

It was suggested during my Confirmation of candidature that a digital projection of my environmental concerns could be considered. My interest in Baudrillard's simulacrum was a way to introduce such an idea which I eventually tried, even though my path was in adjacent direction. After all, the methodology I was deploying suggests working through ideas, then reflecting on the preliminary results, and only then making the decision to reject something, or further develop it. I began experimenting with the digital medium and researching artists who are using it.

Artists have used projection as a tool, at least since the days of the camera obscura, the device thought to have facilitated Vermeer's[168] uncanny photorealism. More recently, however, artists have been applying light-projection technologies in the context of visual art to the medium of painting. This idea seemed to align with Baudrillard's fourth order of the simulacra where it bears no relation to any reality whatever: it is its own pure simulacrum.

During my Confirmation of Candidature, one of the examiners suggested that I could perhaps consider projecting changes onto the background map. I had discussed this idea with the curator and the technical adviser at the University and they were helpful with ideas. Not being a 'digital' expert, but rather a painter, I left that idea for a while but revisited it again towards the end of August 2022. I decided the only way to find out if this idea was worth pursuing, was to purchase a projector and undertake a series of studio experiments. My first attempt was, *Projection of the*

[167] J. Berger, *Ways of Seeing*, London, Penguin Books, 1978. While this book is primarily about ways of seeing women in postmodern culture, I allude to the ways of seeing the landscape as a site of natural beauty or source of wealth. The irony of 'seeing' beauty in the context of Berger's point is not lost on the author.
[168] NOTE: The artist Vermeer is mentioned Section 2.1.

Glenshera Silica Mine (Figure 114) which was, to say the least, inferior compared to what I have seen in galleries.

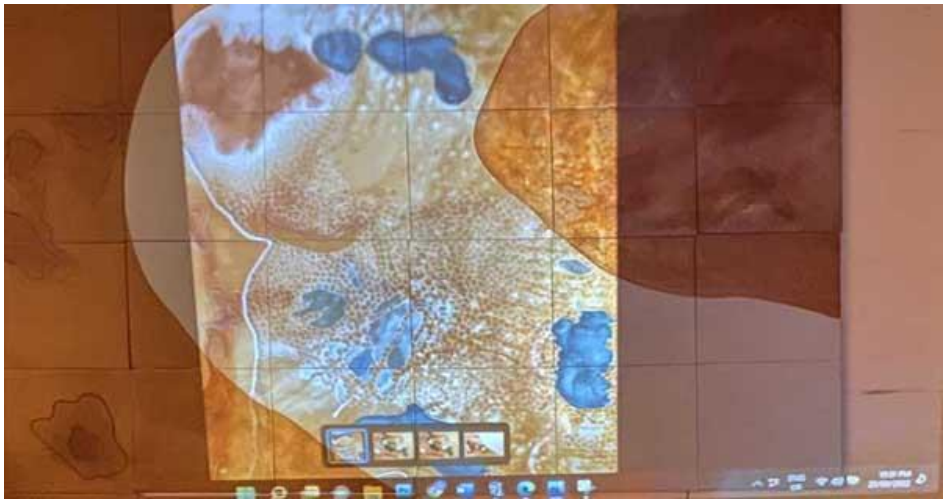

Figure 114: Loi Magill, *Projection of the Glenshera Silica Mine* on Mylar projected over a section of the Inland Sea.

After this attempt, I started researching ‘projection artists’, ‘projection mapping’ and ‘video artists’. I discovered Japanese artist Ryoichi Kurokawa, who starts with what surrounds us in nature, decodifies it scientifically, and collaborates with scientists and astrophysicists to digitally generate physical environments in which we can move around, see and hear.

Italian art critic and historian, Angela Maderna writes:

> Let us not give in to the temptation to instinctively classify the experimental work of Ryoichi Kurokawa and give it the simple label of computer art. That could lead to an interpretation in the mode of the media theorist Marshall McLuhan (‘the medium is the message’), limiting the wide range of possibilities that are being offered to us. The matter is much more complex. In

> truth, this artist's unusual approach to a specific technology that seems cold and detached allows him to reveal unexpected instances of its potential.[169]

In other words, Kurokawa utilises software that has been created for some other aim, and creates and sets up a new world, one not overly determined by the medium.

Further research of artists led me to American visual artist, Cheryl Walker, whose work (Figures 116 and 117) visually gave me an idea of how to produce a digital projection. I could envisage my 'Great Inland Sea' being projected onto a gallery wall with an overlay projected showing landform changes over time. However, the logistics of the programming was beyond my area of expertise, and with time now pressing, I returned to painting as my first choice of medium. The idea is still one I will pursue in due course, when I have the luxury of time to do so. However, some ideas did emerge from these experiments that are adjacent to the significant work I originally intended.

Figure 115: Ryoichi Kurokawa. https://www.domusweb.it/en/art/2018/10/09/digital-nature-by-ryoichi-kurokawa-on-display-in-modena.html

[169] A. Maderna, 'Digital Nature by Ryoichi Kurokawa', *Domus* (10 Oct. 2018), https://www.domusweb.it/en/art/2018/10/09/digital-nature-by-ryoichi-kurokawa-on-display-in-modena.html, accessed 10 Nov. 2022.

Figure 116: Cheryl Walker Art, W*ithout projection*
https://cherylwalkerart.com/gallery/installation/wall-painting/

Figure 117: Cheryl Walker Art, *With projection*.
https://cherylwalkerart.com/gallery/installation/wall-painting/

One other idea I pursued to a point, and still on the projection idea was to physically de-construct the map by cutting it into its one-hundred and sixty separate pieces, laying them out at random, (alluding to the argument that reality is a contested assumption – that the map constructs the territory), but leaving all the 'sea-coloured boards' out, thus providing a clear area to project onto. This idea contextually signifies the sea 'draining away' leaving traces of past geographical features such as Mungo Lakes, Menindee Lakes, Lake Eyre and many other ephemeral lakes scattered across what was once the 'Great Inland Sea'.

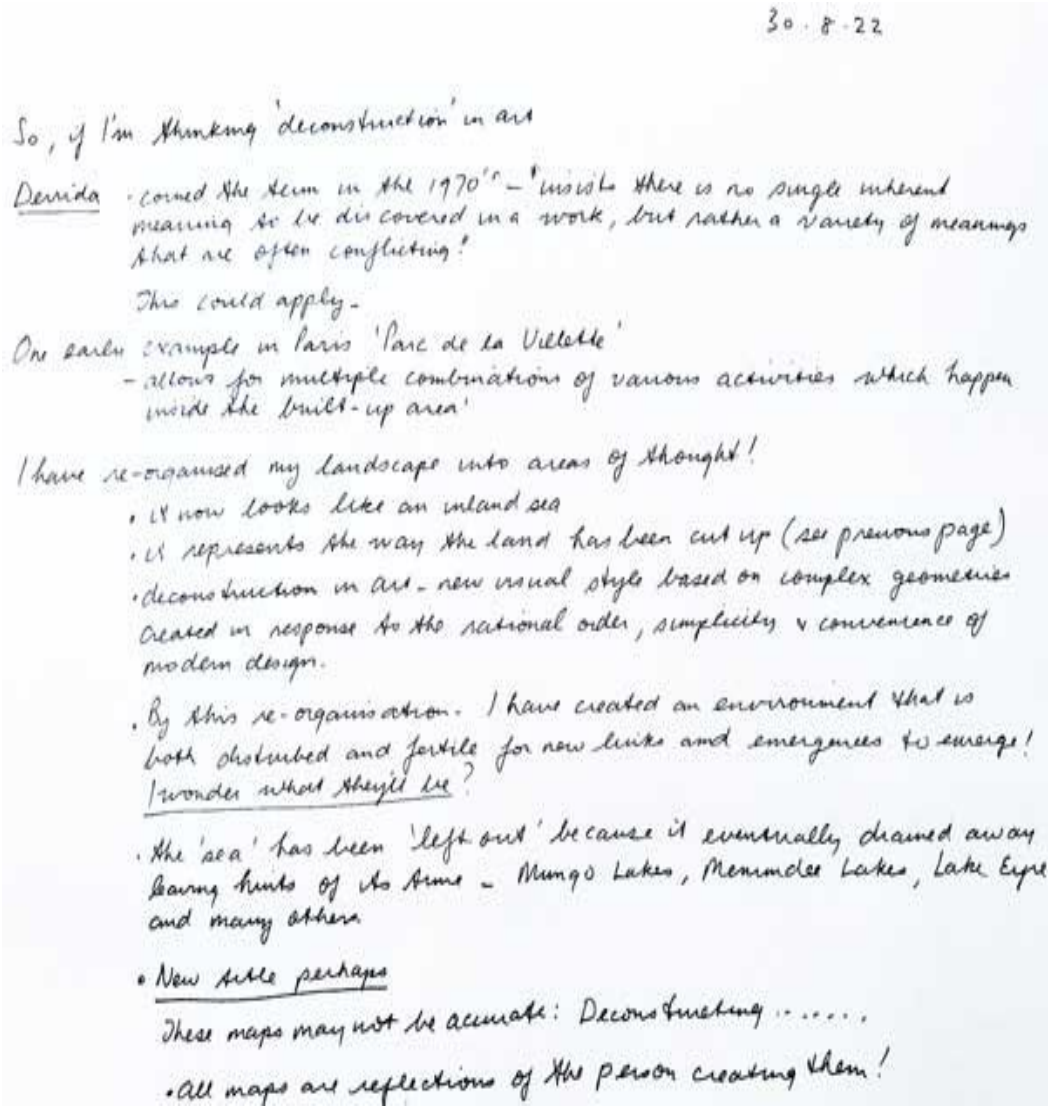

Figure 118: Visual Diary No 5 Page 84 showing the thoughts noted about 'deconstruction in art'.

Figure 118 shows my thoughts on 'deconstruction' and how it is positioned within art. The French philosopher, Jacques Derrida, in a challenge to structuralist assumptions, coined the term in the 1970s. The term meant that there is no single inherent meaning to be discovered in a work, but rather a variety of meanings that are often conflicting or in "play". In other words, the meaning discovered could be central to the work, or it could be on the perimeter of thought. While the direction of the work did not develop along deconstruction lines, the traditional research did suggest non-traditional outcomes, such as those discussed below (Figure 119) for example.

Figure 119: Loi Magill, Collecting all the ‘sea’ boards together for a projection area, (2022)

By cutting up and re-arranging the pieces together in random ways, somewhat akin to a ‘word salad’, the ‘sea’ can take any number of formal arrangements. Leaving the light-coloured boards together in the centre was another way of looking at the ‘inland sea’. Metaphorically, the use of the word ’cut’ refers to the land and what has been done to it. Mountain tops have been ‘cut’ off to reveal coal seams, trees have been ‘cut’ down to clear land, holes have been ‘cut’ in the ground for mining, tunnels have been ‘cut’ out of the sub-surface and so on. These reflections suggested a new meaning when referencing the landform changes. Maybe this should have been a new topic title – ‘These maps may not be accurate: Death by a thousand cuts,’ which to me, implied the end of an idea that had been researched and tried until all ideas responding to the Great Inland Sea had been exhausted.

Figure 120: Loi Magill, Physical deconstruction of the map showing the deleted ‘sea boards’, (2022)

CHAPTER 4: FINAL OUTCOMES

Electricity opens a field of infinite conveniences to ever greater numbers, but they may well have to pay dearly for them.
Winston Churchill, 10 July 1951, Royal College of Physicians, London

4.1 The research question

After spending several months on the earlier part of this research as described in the previous chapter, where I discovered how our country has been damaged by the effects of mining and its subsequent toxic tailing ponds scattered throughout the land and other environmental disasters such as nuclear testing and its long-lasting effects on the land, my focus turned increasingly to the environmental impacts on our land caused by human intervention – in particular, after colonisation – and how to represent the enormity of the problem creatively, through non-traditional research outputs. My research question was then re-formulated to ask 'Can mapping toxic locations through works of art, contribute to our awareness of environmental issues in the Age of the Anthropocene?' Showing, in this context, became more than showing work through an exhibition, and more about *showing* or pointing to, what is not found on maps of the conventional kind.

By offering the abstract maps as submitted artworks it was intended to fill a gap in the field by presenting non-traditional research outcomes in the form of abstract 'maps' of such locations, as opposed to traditional landscape paintings of given sites. The landscape has markedly changed, demanding a change to the way it is represented, or 'mapped'. My intention is to 'map' both the site and its ecological impact, to 'give direction' like a conventional map, but not to a destination, which is the conventional use of the map, but rather to an environmental problem – to direct the viewer to the problem, that is, to what the map does not show.

4.2 Works on glass

Towards the end of October 2022, I revisited the glass-art I completed for my Masters. Due to COVID-19, these were never exhibited and were submitted as images in the final exegesis. I have always liked the abstract aesthetic effects of these works – their toxic beauty, so I decided to investigate a little further into the

printing costs and to establish the most suitable support to use. I therefore returned to these works, as per the cyclic research process, reflecting on their possible use as one of the final outcomes of the research. Since these images were to reflect the toxic ponds, the residue of the mining process, it seemed obvious to choose a metallic finish photographic paper. I sent two examples for printing and was pleasantly surprised when they came back (Figure 121 and 122).

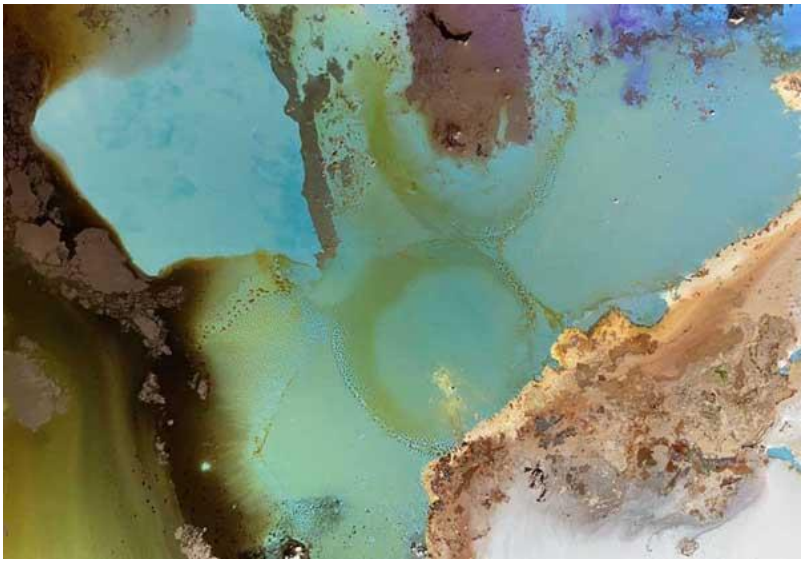

Figure 121: Loi Magill, *Tailing Ponds 1*, (2022), ink on glass, photographic print on Ilford Crystal Galerie, 290gsm

Figure 122: Loi Magill, *Tailing Ponds 2*, (2022), ink on glass, photographic print on Ilford Crystal Galerie, 290gsm

The tailing ponds look like Abstract Expressionist works, or perhaps works of art *informel* – as much Dubuffet as de Kooning – as their aesthetic qualities are as awful as they are beautiful. I imagined these prints as abstract maps of tailing ponds, and one example that suited this purpose was the BHP Olympic Dam in South Australia. These tailings contain approximately 80% of the radioactivity associated with the original ore and characteristically also retain around one-third of the uranium from the original ore. Since 1988, Olympic Dam has produced around 180 million tonnes of radioactive tailings, intended to be left in extensive, above ground piles on-site, imposing ongoing risks – effectively forever. Tailing wastes retain the radioactive decay chains of uranium, thorium and radium, and require isolation from the environment for over 10,000 years.[170] These toxic chemicals produced from the mining operations are now reflected on the surface of the photographic paper. To visualise the actual chemicals used in the development of photos, I researched the Periodic Table of Elements[171] and discovered chemicals such as sulfur, chlorine, bromine, iodine and flerovium might be used in such production. The chemicals used in photo production reflect the chemicals used in the mining process, but due to the same issue with Mylar and other plastics, it was considered the materials, while carrying the 'message', also carried other risks.

[170] Friends of the Earth, 'BHP Olympic Dam tailing or leachings an "extreme risk" to workers and the environment', (2019), https://www.foe.org.au/bhp_olympic_dam_tailing or leachings_an_extreme_risk_to_workers_and_the_environment, accessed 3 Feb. 2023.
[171] National Library of Medicine, 'Periodic Table of Elements', https://pubchem.ncbi.nlm.nih.gov/periodic-table, accessed 21 Mar 2024.

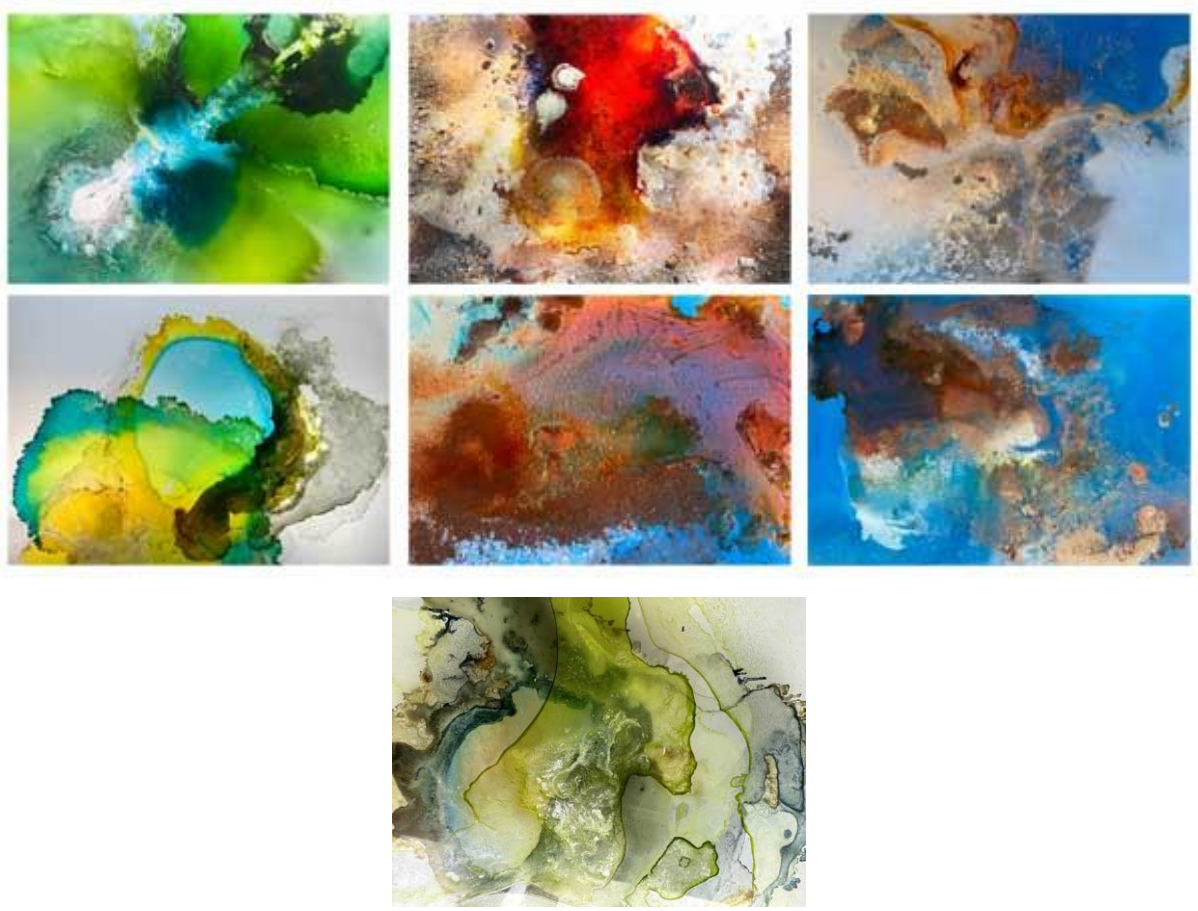

Figure 123: Loi Magill, *Toxic Ponds*, (2023), works on glass, photographic prints on Ilford Metallic Gloss, each 594 x 841 mm.

4.3 Altered states

Mining, mine shafts, land clearing, creation of dams, cities, roads, rails and tunnels, dust pollution and much more have been identified as significant examples of ways in which our land has been degraded and these phenomena have been used as source material for the creation of the artwork to address these issues. Mining impacts our lives in unimaginable ways. Minerals and metals are in mobile phones and transportation, paints and jewellery and buildings, and even dog and cat food is manufactured from mining operations. In fact, everything that is not grown comes from a mine! As Kate Panchuk explains – 'if you can't grow it, you have to mine it,' meaning that anything we can't grow we have to extract from Earth in one way or another. This includes water, of course, our most important resource, but it also includes all the other materials that we need to construct things like roads,

dams, and bridges, or manufacture things like plates, toasters, and telephones. Even most of our energy resources come from the Earth, including uranium and fossil fuels, and much of the infrastructure of this digital age depends on copper as a conductive material that is resistant to heat.[172]

Tailings ponds are the structure created to hold tailings from mining operations that store acutely toxic chemicals, including high concentrations of dangerous naphthenic acids, and are known to leak and evaporate their content into the surrounding environment. In spite of the small scale implied by the word 'pond', these 'ponds' often stretch as far as the eye can see, sometimes leaking contaminants into groundwater and emitting greenhouse gases.

The final artwork for this doctoral research therefore aims to bring to the attention of viewers, in original aesthetic outcomes, works that convey, or map the extent of the damage to our environment, pointing viewers in the direction of these toxic constructions, places not seen on conventional maps. Some of the geographical locations that I have mapped as artworks, such as the gold mining areas of Boddington and Telfer Mines in Western Australia, the uranium mine at Olympic Dam in South Australia and the Tanami gold mine in Northern Territory could hypothetically be classed as beautiful in appearance, but are in reality, 'Altered States' – toxic locations, that are detrimental to our land, rivers and oceans yet have, oddly enough, aesthetic qualities, or so I suggest.

Hypothetically my abstract maps could, or perhaps should, discourage further violation of our planet, but in reality, will not do so. Ironically, I am using the technology and equipment provided by such mining to create this document and subsequent art. However, if the net gain of such works is greater than the cost, a moral or ethical argument can be made. I suggest art can expose these issues in a way that science or other forms of reporting cannot. This is where mapping territories or sites can be put to use.

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[172] K. Panchuk, 'If you can't grow it, you have to mine it', *Physical Geology, University of Saskatshewan* (n.d.), https://openpress.usask.ca/physicalgeology/chapter/18-1-if-you-cant-grow-it-you-have-to-mine-it/, accessed 18 May 2023.

Most modern maps provide a plethora of information, examples of which are where current fires are, how bad the traffic is in areas, what roads are safe to travel, but what they do not show are how toxic locations, products of mining, have had a detrimental effect on the land and its inhabitants. However, by creating works as maps, I can direct viewers to these sites (who might not otherwise access Google Maps or read science papers), to see them for themselves. Not all is shown by Google Maps either, that is where art can intervene.

Only recently, it has been admitted by the head of the largest gold mine in Australia's that the operation has been emitting too much dust in breach of clean air rules something not shown on Google Maps.[173] With over 350 operating mines in Australia and over 80,000 abandoned mines, these mines leave gaping holes in and under the ground that are in places over two kilometres deep, and in some cases leaving hazardous areas that can cause injury or death, again, this is not shown on conventional or technological maps.

As mentioned previously, Mt Isa mine in Queensland has 1600 kilometres of underground tunnels. It is some of these degradations to the land and beneath it that I have mapped. Mt Isa mine, as an example, takes up an area of 7,066 square kilometres of land for its mining purposes. Damage to the land can be soil erosion, polluted waters and the possible drain on underground water reserves, radical changes to the landscape, damage to roads and other structures, the destruction of wildlife and air pollution from the dust and particles associated with mining roads and stockpiles.[174]

A period of approximately three weeks passed during which time I spent thinking, reflecting and undertaking traditional forms of research before I decided on the next studio research to be undertaken. Earlier I had changed from oils to watercolours and decided to use six trial sheets from that exploration (Figure 110),

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[173] J. Woodburn & H. Hogan, 'Cadia Valley Operations admits to dust pollution at NSW gold mine amid health concerns. ABC Central' (6 Jul 2023), https://www.abc.net.au/news/2023-07-06/cadia-gold-mine-responds-dust-pollution-nsw-epa/102568702, accessed 10 Jul. 2023.
[174] Applied, 'Addressing the environmental impacts of Australian mining's past and future', *Australian Academy of Technology and Engineering* (Nov. 2017), para. 2,https://www.atse.org.au/wp-content/uploads/2019/01/AS-2019-01-30-APPLIED_Minerals-Addressing-the-environmental-impacts-01-D5-web.pdf, accessed 9 Nov, 2022.

while never quite abandoning the hope of creating a series of digital works – these are discussed in the data mining series in Section 5.4.

Argentinian artist Federico Winer states 'I view maps as a form of art, as a sublime interpretation of the world'.[175] His maps display a sense of grandeur and awe. Winer searches for patterns, forms, geometries, and colour, using Google Earth as his starting point, which he then captures at high resolution and distorts and experiments with on the computer screen. Winer is an artist of the Age of the Anthropocene whose interest in the beauty of maps and their complexities manifest in his digital artworks.[176] He views maps as sublime interpretation of the world. Most of my research utilised the Google Earth platform, enabling me to explore mining sites, tailing ponds and other man-made alterations to the land such as dams and large tracts of cleared land. The following images (Figure 125 and Figure 126) are examples of non-traditional research outcomes. Using some of the sheets of watercolour paper mentioned earlier, the images show the process of observing the mine from a satellite view, selecting a watercolour sheet and interpreting the shapes of the mine aesthetically. For example, in Figure 121, the orange lines represent the roadways, runways and pipelines and other areas of demarcation on the mining site.

Figure 124: Google Earth*, Snapshot of the Nhulumby Bauxite Mine,* (2023)

[175] F. Winer, 'Ultradistancia', *Satellite Fine Art* (2022), https://www.ultradistancia.com/about, accessed 20 Nov. 2022.
[176] F. Winer, 'Satellite fine art by Federico Winer', 2022, *Ultradistancia*, https://www.ultradistancia.com/

Figure 125: Watercolour sheet to be recycled, (2022)

Figure 126: Loi Magill, *Interpretation of Nhulumby Bauxite Mine,* (2023)

A series of works emerged from the initial attempt shown (Figure 126). Figure 127 below are conceptual abstract representations of mines, tailing ponds, cleared land for cities and dams on the Australian continent. I envisaged installing the work to fill the wall in A Block Gallery for an exhibition in 2023 with artworks showing forms of degradation to the land. From the Wilderness Society I learned that Australia is one of the worst developed countries in the world for broadscale deforestation—killing tens of millions of native animals (including threatened species) and wiping out endangered forests and woodlands. In fact, nearly half of our forest

cover has been cleared in the last two hundred years.[177] These maps of the sites of destruction are attempts to direct the viewer to these sites through aesthetic means.

Figure 127: Loi Magill, *Altered States*. 2023, 32 watercolour sheets, each 76 x 57 cms, watercolour, gouache and acrylic. (Appendix B covers each of these individually).

The process of bringing these abstract maps to fruition involved – firstly, a list of mines and their products, such as gold from Boddington and Tanami mines, bauxite from Nhulumby, coal from Victoria, then searching for those mines in Google Earth and selecting the most appropriate for an aesthetic outcome. That meant looking for balance, form, interesting shapes and colours, while balancing this with the reality of the alteration to the sites, to create that *Altered States*. This necessitated the use of some artistic licence. For example, some tailing ponds looked more toxic than others, the geometric positioning of roads were likely to change, the size of the open cut mines was considered, and deciding what other features to include and what to leave out became important decisions to get the 'balance' right, but rather than the modernist preoccupation with balancing parts of the whole, the balance is between the formless and the formal, the abject and the beautiful, beauty and the awful truth of the site in the real.[178]

[177] Wilderness Society, 'Ten Facts about deforestation in Australia' (2022), https://www.wilderness.org.au/protecting-nature/deforestation/10-facts-about-deforestation-in-australia#:~:text=Australia%20is%20one%20of%20the,in%20the%20last%20200%20years!, accessed 24 Nov. 2022.
[178] J. Kristeva*, Powers of Horror: An Essay on Abjection,* trans. Leon S. Roudiez, New York, Columbian University Press, 1982.

To portray the scarred and degraded land I elected to use black paint to reflect the bituminous lining used in tailing ponds. The black paint also served as background to the other colours, but this created a complication because of my initial selection of black paint which were all different – in matt, semi-gloss and gloss finishes. I experimented with a variety of gouache and acrylic paints, finally settling on 'carbon black' acrylic which, when slightly diluted, gave a flat finish which was important for the backgrounds, not wanting them to 'shine' with the rest of the work. Other dilemmas surfaced such as different brands of acrylic paint causing inconsistent effect – some having a slight sheen and did not cover evenly. In the end, I decided to leave well alone since the different effects on the surface suggested alterations to the land. The changeable black surfaces metaphorically could be interpreted as the way the land has been changed through the mining process. It is these anomalies that have given rise to further ideas for the final exhibition discussed in Section 4.5.

In a similar fashion, a list of dams was compiled, abstract versions were sketched and the decision to complete the water, that had inundated the land, was painted black, giving the areas covered a sense of a deep, almost bottomless hole in the surface of the Earth. Adding to the mix were the capital cities of Australia, reasoning that the amount of land cleared for roads, housing and all other developmental sites needed for city building contributed to land degradation.

The last part of the 'Awful Beauty' artworks reflects ways in which some toxic ponds are lined to reduce the effects of leaching into the surrounding ground. A product produced by a company called Axter is 'Coletanche', one of industry's answers to provide a waterproof lining for ponds and other areas, such as lining a runway at a regional airport. This product is a bituminous geomembrane (a very low permeability synthetic membrane liner or barrier commonly used to control fluid (or gas) migration in a human-made project, structure, or system) coming in widths of up to 5.1 metres, and is designed to guarantee excellent mechanical and chemical resistance over the long term (reportedly between 30 and 60 years).[179] Bitumen is made from crude oil, which also must be mined through drilling or pumping. As an

[179] Axter, 'Coletanche' https://www.axter.eu/coletanche/article/mine-waste-cover-australia/, accessed 2 Nov. 2023.

example, an area of 140,000 square metres were covered to rehabilitate the tailings dam and waste pond area at the Capricorn Copper mine in Queensland. Another more alarming example is the Olympic Dam in South Australia where "extreme risk" consequences category shows ‘impacts of a potential loss of life of more than 100; an extreme loss of infrastructure and economics; and a major permanent loss of environmental and cultural values – with restoration stated to be impossible’.[180]. It does not take much imagination to expand these facts across the Australian mining sector’s rehabilitation programs and estimate the lasting effects on the environment.

Figure 128: Mine waste cover in a tailings pond at Capricorn Copper (Australia), (2019)

The additional artwork for submission draws attention to the insidious side of the lining of those toxic ponds. I purchased a tin of bitumen paint, and recycled some of the abandoned 30 x 30 cm boards used for the Great Inland Sea (Section 3.6), I then painted 30 of these boards which will be installed on the wall and floor of the gallery for the final outcomes.

[180] Friends of the Earth Australia, BHP Olympic Dam tailings an "extreme risk" to workers and the environment, https://www.foe.org.au/bhp_olympic_dam_tailings_an_extreme_risk_to_workers_and_the_environment

Figure 129: Recycling canvases from the Inland Sea series

Figure 130: First coat of bitumen paint on canvas applied with a roller

Figure 131: First coat of bitumen paint on canvas applied with a brush

Figure 132: Sanded first coat and second coat of bitumen paint also applied with roller

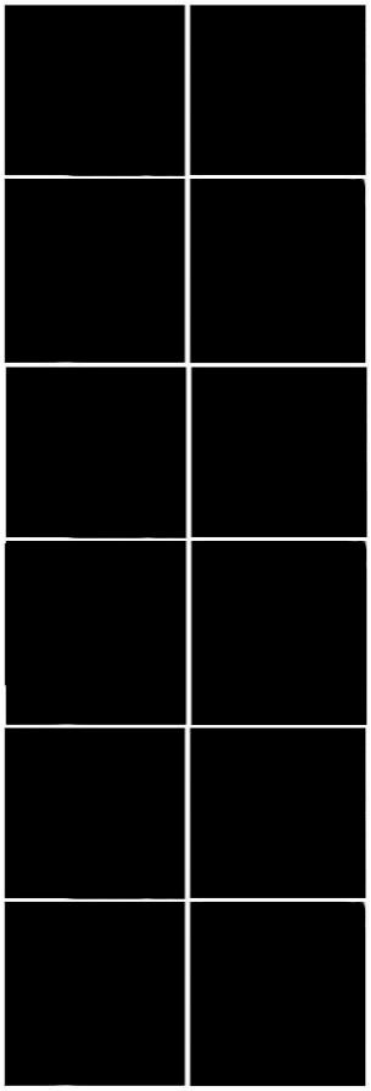

Figure 133: Section of bitumenous boards to be displayed on the floor and wall of the gallery.

4.4 Data mining

A relatively new term ‘data mining’ has appeared in our Anthropocenic age – since the 1990s. Data mining is the process of extracting and discovering patterns of data in large data sets. One example is the invention and use of frequent flyer point systems and customer loyalty cards in business organisations such as airlines and supermarket chains who use joint purchasing patterns to identify product associations. This information is used to gather data on their customers to increase their knowledge of consumer habits, such as demographics, their interests and location. Data mining can also detect which offers are most valued by customers by the increased sales at the checkout queue. Other examples of everyday events that

use data mining are in the financial services sector, insurance, manufacturing, entertainment and healthcare. New terminologies are connected to data mining and include crypto or cryptocurrency mining, blockchains, and data farming. Data farming as a process uses monumental amounts of energy to mine the data. It is the amount of that energy used and how that energy is produced that is the focus of this chapter.

Figure 134: *Silicon Valley Data Center, (2023)* https://www.connectcre.com/stories/silicon-valley-data-center-market-challenged-by-limited-supply/

Digital currencies are mined and recorded as transactions per second. To further understand the amount of energy used, the example of bitcoin transactions per day, at the time of writing,[181] was 462586.0 which reflects the daily number of transactions registered on the bitcoin network.[182]

The Digiconomist's Bitcoin Energy Consumption Index, which provides the latest estimate of the total energy consumption of the Bitcoin network, estimated that

[181] 25 July 2023
[182] Y-Charts, 'Bitcoin Transactions per Day' (2023), https://ycharts.com/indicators/bitcoin_transactions_per_day#:~:text=Bitcoin%20Transactions%20Per%20Day%20is,registered%20on%20the%20Bitcoin%20network, accessed 16 Jul. 2023.

one bitcoin transaction takes 1,449 kWh to complete, or the equivalent of approximately 50 days of power for the average US household.[183]

The reason why it's referred to as mining is that, much like precious metals, bitcoin has to be extracted from a place, but instead of actual mining pits, computers are used in the extraction process. Simply put, bitcoin mining is basically the process of extracting BTC from the web. Exactly how much energy does this type of mining require? New research[184] has predicted that the amount of electricity consumed by bitcoin mining operations will surge over the next three years, consuming more power than entire countries, including Australia. Even more disturbing facts emerge such as 'using a simulated carbon emissions model, the research led by researchers Dabo Guan and Shouyang Wang estimates that Bitcoin mining will be responsible for 130 million tonnes of carbon emissions'[185], which is higher than the emissions of countries like Qatar and the Czech Republic. The amount of energy used is almost incomprehensible and all but certain to expand exponentially as AI (Artificial Intelligence) expands its reach.

This is important to this exegesis because it relates directly to the mining sector, where coal is widely used to generate the enormous amounts of energy required to run these data farms. While this situation is slowly changing, with renewables entering the energy mix, the pace of new energy introduction is not keeping pace with data mining development and expansion.

As can be seen, data mining consumes a great deal of energy, much of which is supplied by coal generated power plants, of which, at the time of writing, there are 24 coal-fired power stations in Australia alone which are also the largest source of

[183] O. Gonzales, 'Bitcoin Mining: How much Electricity it takes and why people are Worried', CNET (18 Jul. 2022), https://www.cnet.com/personal-finance/crypto/bitcoin-mining-how-much-electricity-it-takes-and-why-people-are-worried/ accessed 18 Aug. 2023.
[184] NOTE: New research refers to the following Footnote No.137
[185] M. Mazengarb, M., 'Bitcoin mining to consume more electricity than whole of Australia by 2024', Renew Economy (7 Apr. 2021), https://reneweconomy.com.au/bitcoin-mining-to-consume-more-electricity-than-whole-of-australia-by-2024/, accessed 2 Jul. 2023.

greenhouse gas emissions in Australia, pumping out 170 million tonnes of carbon dioxide (CO_2) every year.[186]

The problem is not simply the emissions coming from the power plants themselves, there is also the toxic waste associated with the mine that produces the raw materials for power generation. While there might not be an obvious link between typing on a keyboard or downloading imagery, scrolling though social media feeds, much less data mining, the waste from coal mining contains harmful heavy metals including arsenic, mercury, hexavalent chromium, nickel, lead, cadmium and selenium, selenium, materials we aren't exposed to when we are working from the comfort of our homes or workplaces. To examine the real complexities of this type of mining is beyond the scope of this exegesis, but it will suffice to say that what is seen is not always all there is to see. It is hoped the digital works made in response to this crisis will go some small way to pointing out these unseen connections.

Making the artwork discussed in this section entailed a slight shift in thinking and a moderate expansion of creativity. This kind of mining is more lucrative than traditional, or analogue mining, so it is important to know where it comes from, and what damage it does. How could I show data? Where is data? It is taken for granted that there is data, and if so, what exactly is it and where is it and how do we make it and what is the cost? Elementary questions possibly, but questions that may need answers to enable the non-traditional art process of making this body of work to begin.

Our daily use of technology generates data, browsing the internet, what words we click on, how long we spend on a site are all recorded and produce data. Data comes from a host of information gathering sources such as devices including fitness trackers, sensors used by farmers to monitor soil moisture levels and crop health and much more. The data input to the computer is converted into a language the

[186] M. Diesendorf, 'Australia's Polluting Power, Coal-fired electricity and its impact on global warming', WWF Australia (2003), https://wwfint.awsassets.panda.org/downloads/wwf2003coalfinal2.pdf , accessed 17 Oct 2023. NOTE: In China, the situation is worse, with the construction of 41 GW of coal powered generation planned for 2023 alone, which is an expansion on 2022.

computer understands which is called machine language binary code, which consists of only 0s and 1s. This idea served as motivation for a series of works.

Firstly, I tried to imagine data as 0's and 1's in the ether around us, the ether I saw as blue and for some reason in geometric shapes and so created some backgrounds on watercolour sheets with a view to layering some kind of binary code above it. To do this I converted a paragraph from this chapter into binary code.[187] I then printed it onto tissue paper and cut it into shapes. The background layer was overlaid with the binary code. On a glass layer over the top I dripped, poured and splashed inks and other liquids such as alcohol, water, and vinegar, to represent the tailing ponds that are created when electricity is produced. Electricity, in this context, is produced by either burning black or brown coal (which must be mined). Figure 135 shows some endeavours at converting these ideas into mapworks.

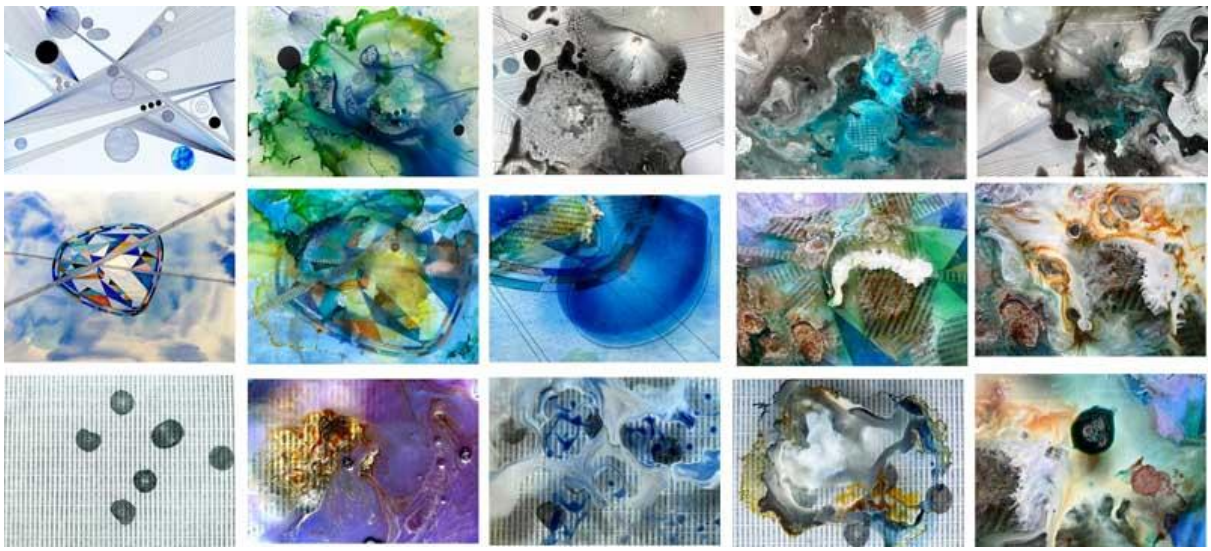

Figure 135: Loi Magill, *Examples of Data Mining 3*, (2023), art on glass

[187] NOTE: Binary Converter - http://www.unit-conversion.info/texttools/convert-text-to-binary/

Figure 136: Loi Magill, *Further Examples of Data Mining* (2023), art on glass, printed on Dura-lar.

While I considered some of these to moderately represent my ideas, I wanted to investigate further. To me, data was constantly on the move, but the difficulty was how to show this idea on a still image. I thought back to my Confirmation when it was suggested that some type of projection could work well (and which I had tried on earlier artworks) with little success. I envisaged the movement of the tailings oozing into the ponds at mining sites and wondered if I could emulate the movement of data in a similar fashion.The following still images (Figures 137 –139) are the results of applying inks on glass layers, photographing them and manipulating those images in Photoshop.

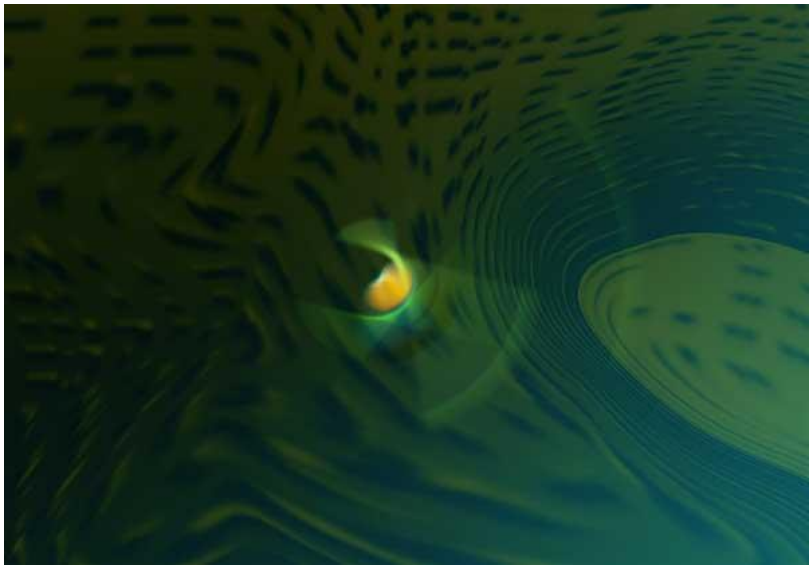

Figure 137: Loi Magill, *Data Mining 1*, (2023), digital art

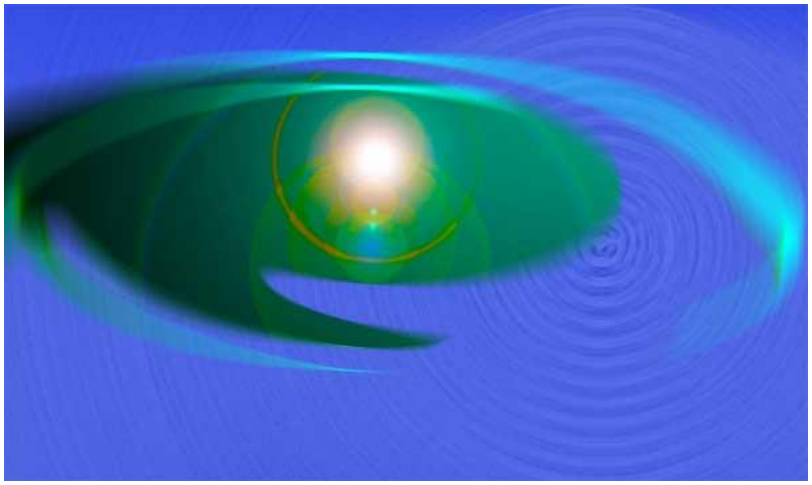

Figure 138: Loi Magill, *Data Mining 2*, (2023), digital art

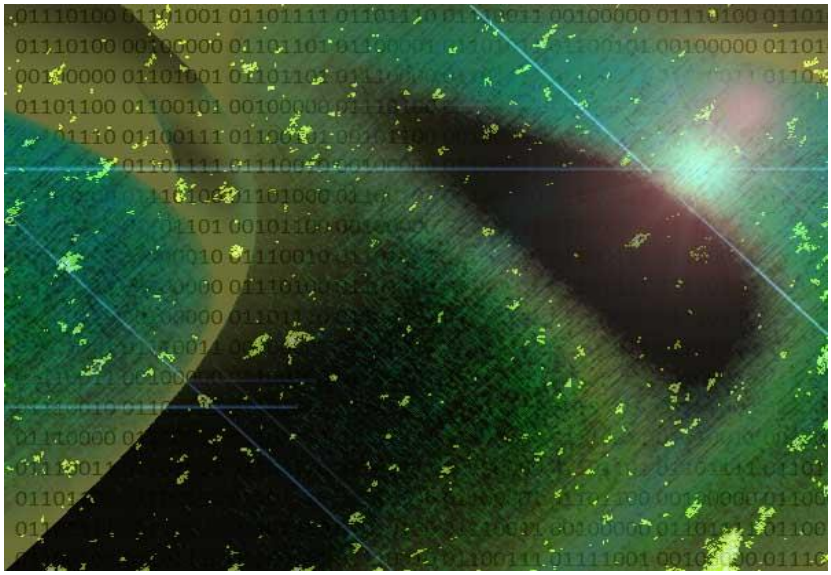

Figure 139: Loi Magill, *Data Mining 3*, (2023), digital art

To further these ideas and to simulate the movement I wanted, I created small digital projections of the chemical reactions of different inks and other liquids mentioned above. Finding a free download of movie editing software, Clipchamp.mp4[188], which included free video backgrounds, I was able to create small looping digital projections (Figures 140 and 141). These were short and only lasted less than two minutes, but needed editing, such as removing sound, which I worked on successfully. I felt as though I made some progress, but also felt the works needed further experimentation to produce more clips making a longer loop. I then tested this using the data projector.

[188] Wondershare Filmora, 'The Best Video Editor, Free Download', https://filmora.wondershare.net/filmora-video-editor.html?gad_source=1&gclid=CjwKCAjwkuqvBhAQEiwA65XxQEQ7TpP2ch1-0bRMVJu0NB-Vk5r3N7EkpXt1rirgP0xIgJ0GSQrAIhoCTycQAvD_BwE, accessed 21 Mar 2024.

Figure 140: Loi Magill, *Data Mining Digital Movie*, (2023),
made with Clipchamp.mp4 free software

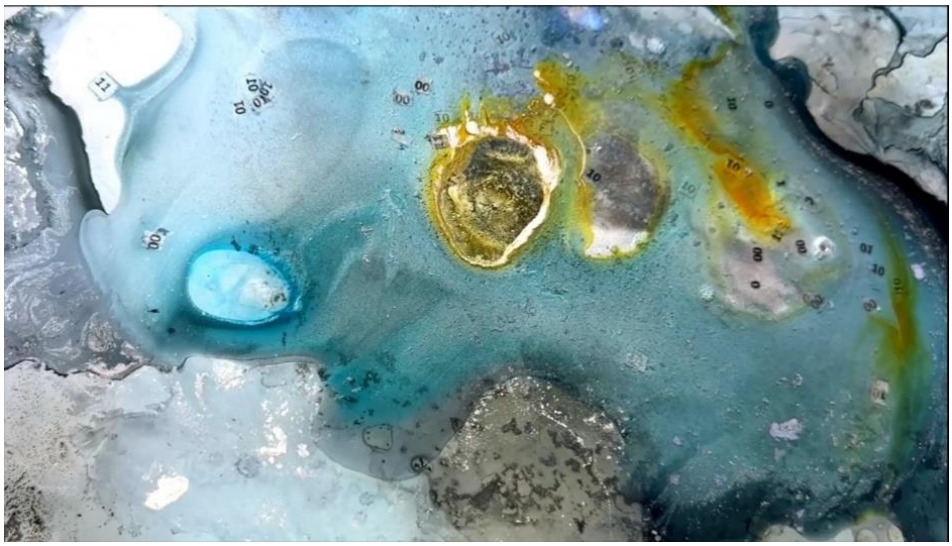

Figure 141: Loi Magill, *Data Flow Digital movie*, (2023),
made with Clipchamp.mp4 free software

It will take more knowledge of the software to make these digital projections to an acceptable format, however, it was my intention to be able to project them onto designated areas in the B Block Gallery. Other ideas emerged, for instance projecting the ‘toxic ponds’ ‘movie’ onto the floor of the gallery, to represent the horizontal orientation of the ponds, and projecting the ‘emissions’ movie on a wall above to emphasise that the by-product of the power stations is belching impurities from the smoke stacks into the atmosphere. To achieve this, I drove down to

Traralgon in Gippsland Victoria to the Loy Yang Power Station, a six-hour round trip from home, with the intention of taking small videos of those belching smokestacks.

Figure 142*: Loy Yang Power Station, Traralgon, Victoria*, (2023).
Photograph: Loi Magill.

From this and other images I eliminated everything except the belching smoke, for example, I removed the sound of the generators, birds flying across the area and the sound of dogs barking in the distance. Other problems in the creation of the digital projections were overcome, for example, to try and alleviate the movement of the camera which necessitated buying a tripod specifically for mobile phones. Another problem was the file size, but I found that if I exported the digital projections at 720p rather than 1080p it reduced the file size dramatically.

Figure 143: Loi Magill, *Emissions,* 2023, digital projection screenshot

I then tested the digital emissions movie against the background of clouds painted earlier on drafting paper. I anticipated the *Emissions* digital projection (Figure 143) would play over the background (Figure 144). I tested this idea in a room at home and it was a complete failure, the background paintings were too dark to see the digital projection over the top. Figure 144 shows the background for the projection, while Figure 145 shows the projection over the background, resulting in a clutter of unrelated shapes.

Figure 144: Loi Magill, *Clouds*, 2023, watercolour on drafting paper

Figure 145: Loi Magill, *Emissions*, 2023, projection

I then decided to use plain drafting paper for the screen. This can be any length and would be suspended from the ceiling. The middle of the screen will be approximately 152 cms from the floor. This idea was further refined by rejecting the idea of the ‘screen’ across the gallery and instead, projecting the ‘emissions’ video onto the end wall of the gallery, thus complementing the ‘toxic ponds’ video projected onto the floor in front of that end wall. This ‘toxic ponds’ movie involved an entirely different procedure, which involved several trials to get the most appropriate ‘look

and feel'. The final result, Figure 146, is a short video projection of the work which shows, in slow motion, the oozing of the toxic waste into the leaching ponds, a mixing and swirling of the different chemicals interacting with each other. This video took many attempts to achieve the right 'consistency' and feel of the process.

Figure 146: Loi Magill, *Toxic Pond,* 2023, screenshot of digital projection. Materials: soil, water, inks, alcohol, vinegar, oil, methylated spirits, vinegar and differing proportions.

The evolution of this 'data mining' studio research has been, and still is at the time of writing, an exploration into uncharted areas of digital art for this project. The original suggestion at my Confirmation of Candidature as mentioned earlier, was to think about 'projection', a rather whimsical idea (in my mind) and far removed from my original plan of work which was to produce artworks on paper. As the project developed and coming into the final stages I could see where that whimsical idea could be used to further my ideas of showing an awful beauty of toxic locations. To my mind this particular exercise has been a prime example of practice-based research where one idea has built on another via non-traditional research solutions that yield more problems or suggestions for resolved works, again evoking thoughts, experimentation and further practice. This is a process of reflection and return, an iterative process that produced a final outcome in the form of a video out of more than 50 takes, and as many reflections on the shortcomings of those takes. Examples include how to use the camera to its best advantage, how to position the

tripod, how to arrange the materials to the best advantage, how to edit the audio, how to crop unwanted sections of the movie, how to use transitions, speed, colour effects and many more. The selection process was lengthy, for example a re-run might expose my own reflection that was missed the first time. Despite the setbacks I felt as though I had made a significant breakthrough in my research investigations, providing me with a further skillset that may be used in the production of future research.

With a choice of several digital projections now on file, I felt it was time to consult further with the curator and my supervisor to select the appropriate digital images for projection and final artworks to be submitted for examination. This decision would affect the final layout for the gallery.

4.5 Toxic reality

In my endeavours to portray data mining as bits and bytes travelling through the ether, I examined what I was really trying to convey; I wanted to stimulate some sort of action so that viewers might feel implicated in their part in the toxic reality of our Anthropocenic times. In other words, I wanted the works to produce a different kind of viewer – a critical viewer of the kind Walter Benjamin engages in his seminal work on cinema – where he argues the viewer of film, as opposed to the viewer of traditional autonomous art, 'changes into a progressive' participant, as opposed to the passive consumer of the modernist image.[189] I realised my task as a visual artist or non-traditional researcher was to present, in some way, a visual snapshot of our complex world, bringing forth a closer understanding of the world we live in, and possibly, inspire some kind of action or critical position in the spectator. To this end, I researched further into how I could visualise this data mining and display it as an artwork. Turning the phrase around gave me the start I needed, *data visualisation*. This became part of my reflective and circular practice-based methodology. By returning to the Periodic Table I first encountered back in October 2022 when I researched the chemicals used in the manufacture of watercolour paper, I now looked at the toxic chemicals, emissions and leaching from mining operations that

[189] W. Benjamin, 'The Work of Art in the Age of Mechanical Reproduction', Illuminations, Fontana Press, 1992, p. 227.

had motivated my earlier artwork, ‘Altered States’, and how that affects our way of life.

Firstly, I had to collect data on the toxic outputs, decide which were the most important aspects that would prick a conscience, incite a conversation or even raise an awareness of our frail environment. Since the latter part of my artwork focuses on the toxic tailing ponds from the mining sector, I sought to find out which of the mines I have portrayed were the most toxic to humans and the environment. All mines produce tailings which are either stored in ponds or sent off for further processing and refining.

For example, coal-fired power stations produce electricity, but when the coal is burned it releases airborne toxins and pollutants such as mercury, lead and other heavy metals, but also sulfur dioxide, nitrogen oxides, particulate matter which contains microscopic solids or liquid droplets that can be inhaled and cause serious health problems. The Olympic Dam in South Australia produces uranium, whose tailings include thorium 230 which decays to produce radon gas. With a half-life of 76,000 years, it will produce radon for millennia. In the atmosphere, radon decays into the radioactive solids, polonium, bismuth, and lead, which enter water, crops, trees, soil, and animals, including humans.[190] The gold mines such as Boddington, Tanami, Plutonic and Prominent Hill, as well as ravaging landscapes and contaminating water supplies, also contribute to the destruction of ecosystems. Their toxic output consists of cyanide, mercury, and other substances which are regularly released into the environment due to dirty gold mining methods.

Secondly, I then had to find a way to visualise this data as an artwork. I investigated the Periodic Table further to discover which were the most toxic of all chemicals, their chemical structure, and then convert these into an artwork. I decided on using visual metaphors to convey my message. To provide a visual metaphor for toxicity I investigated which art materials were hazardous or toxic to artists. There is much written on historical examples of such toxic effects on artists.[191] For example, it was possible that Vincent Van Gogh’s physical and psychic symptoms were caused

[190] Human Health Fact Sheet, 2001, http://hpschapters.org/northcarolina/NSDS/thorium.pdf.
[191] https://www.artpublikamag.com/post/when-color-kills-toxic-pigments-through-the -ages. Accessed 1 March 2024.

by chronic lead poisoning. Arts and Crafts founder, William Morris's mass-produced wallpaper designs 'Jasmine Trellis', 'Wreath', 'Willow', 'Chrysanthemum', 'Strawberry Thief', all contained a cheap arsenic laden pigment that 'caused health problems', of which he was aware.[192]

I researched the chemical structure of the main toxic chemicals produced in coal, uranium and gold processing, and instead of drawing each one, I decided on a combined 'map' of them all. I then looked at the colours of each and reduced the colours down to; red, purple, grey, lime, blue, orange and green. These colours I tested on drafting film using copic pens, copic inks, alcohol inks and acrylic inks and sprays. Copic colours are alcohol based and can emit toxic fumes and must be used in ventilated areas. Acrylic inks are pigments suspended in acrylic resin binder or polymer emulsion which could cause some irritation to eyes and skin.

The following trial artworks are on re-purposed polyester Mylar[193] and drafting film, and which, if stored in appropriate conditions, could last over 500 years. Figure 147, *Toxic Reality 1*, represents the emissions from the smoke stacks while the layer beneath this shows obliquely, an abstract version of some of those chemical compounds that form those insidious emissions, such as mercury, arsenic, carbon dioxide, formaldehyde, benzene, carbon monoxide, sulfur dioxide and nitrogen oxide.

[192] C. St Clair, 'How natural greens inspired the wallpapers of William Morris', Elle Decoration (2021), https://www.elledecoration.co.uk/decorating/a34952566/william-morris-green/, accessed 8 Nov. 2023.
[193] NOTE ON MYLAR – See Appendix D.

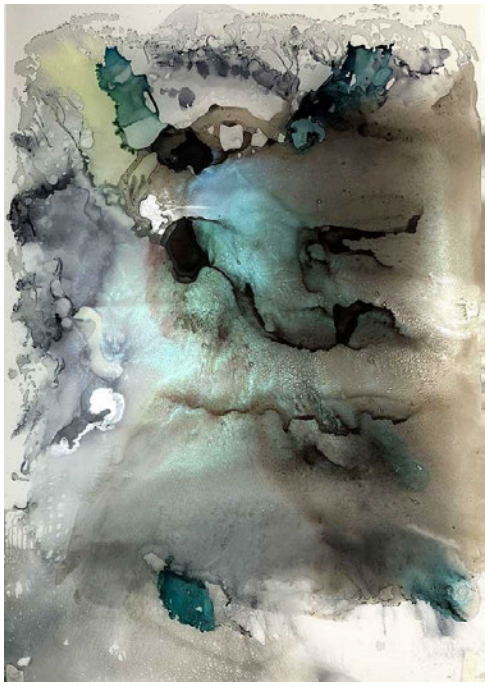

Figure 147: Loi Magill, *Toxic Reality 1*, 2023, inks on Mylar, top layer

Figure 148: Loi Magill, *Toxic Reality 2*, 2023, inks on drafting film, underneath layer

Figure 149: Loi Magill, *Toxic Reality* with underlay of chemical compounds, 2023, inks on Mylar

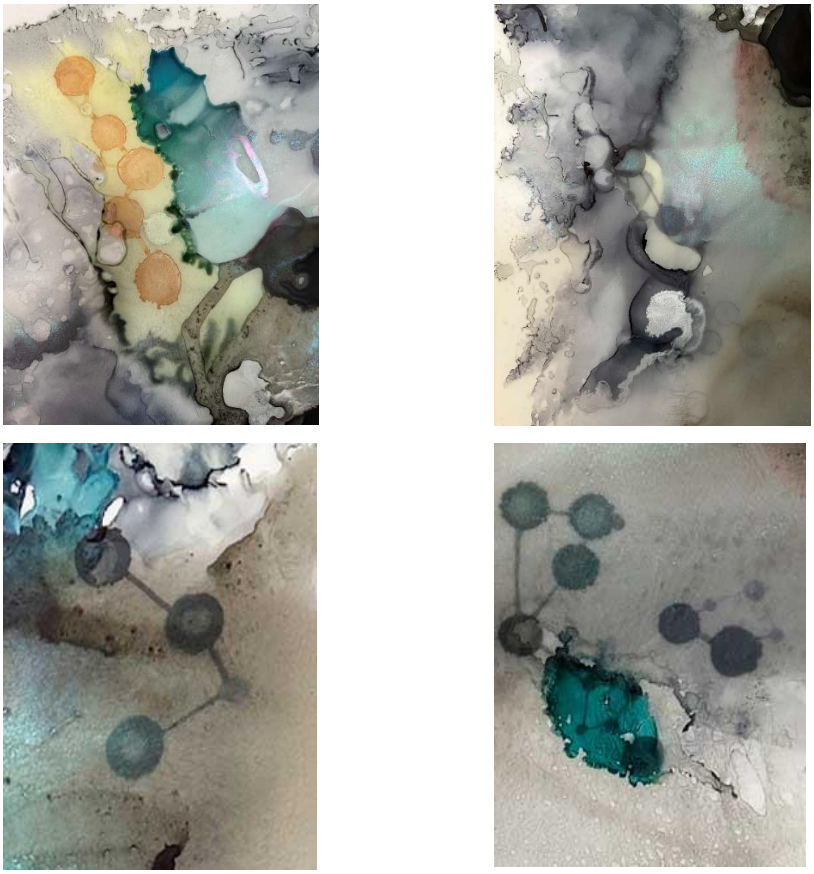

Figure 150: Loi Magill, *Toxic Reality 1*, Close up showing chemical compounds on underlay, 2023, inks on drafting film

Figure 151: Loi Magill, *Toxic Reality 2*, 2024, inks on drafting film

Figure 152: Loi Magill, *Toxic Reality 2*, 2024, inks on drafting film (underneath layer)

These works contribute to my overall project by reinforcing the idea of the toxic nature of mining and the effect it has had, and will continue to have, on our environment, particularly since the Anthropocene epoch commenced. All mining produces some kind of toxic waste, be it into the atmosphere or degrading the land, water, and its surrounds. The latter part of this chapter has focused mainly on coal mining, which, according to the Climate Council of Australia[194] is the most polluting way to produce electricity, adding to greenhouse gas pollution and contributing to climate change. It is also Australia's primary source of energy and a major export for Australia, and thus its effects are deeply rooted within Australia through economic and environmental impact.

[194] Climate Council, 'Killer Coal: Just how bad are the health effects of coal', 2023, https://www.climatecouncil.org.au/killer-coal-just-how-bad-are-the-health-effects-of-coal/#:~:text=Along%20with%20adding%20to%20greenhouse,miners%2C%20workers%20and%20surrounding%20communities.

CONCLUSION

'The beautiful is what is presented without concepts as the object of a universal liking'. I. Kant.

The overall aim of this Doctor of Creative Arts project was to answer the research question, by creating abstract maps as works of art that show the impact on the environment caused by the effects of the Anthropocene within Australia. By raising an awareness of these environmental impacts[195], which is critical for all, it can help to create a more sustainable Australia by raising awareness which might lead to more sustainable practices, such as solar, wind and water, and investigating more sustainable ways to prevent the leaching of toxic chemicals into the environment. The series of artworks and Exegesis is an original contribution to the knowledge by identifying the problem of our deteriorating environment mainly caused by deforestation, mining and its by-products, and land clearing for industries, with a fervent hope that it may engender discussion by arousing emotions engendered by the awful beauty of the toxic environments described in the artworks[196].

The research title 'Awful Beauty: Mapping Toxic Locations in the Age of the Anthropocene' and the subsequent research question, 'Can mapping toxic locations through works of art, contribute to our awareness of environmental issues in the Age of the Anthropocene? comprised an investigation into how our land has been changed in the age of the Anthropocene. With a focus on Australia to narrow down the research, this included research into, in particular, the mining sector, the damage to the environment, the toxic emissions and leaching ponds which were an integral part of such endeavours. To portray the works as art, metaphorically 'maps' were used to indicate these locations by a variety of visual means. These included

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[195] J. Pinto, R E., Jr. Gutsche, and P. Prado, 'Climate Change, Media and Culture: Critical Issues in Global Environmental Communication', Emerald Publishing Limited,2019-10-14, *ProQuest Ebook Central*, https://ebookcentral-proquest-com.ezproxy.usq.edu.au/lib/usq/detail.action?docID=5909907. Accessed 18 February, 2024.

[196] E. Gout, 'Emotional Appeal: How Art Can Inspire Action on Climate Change', Columbia Climate School, April 20, 2021, https://news.climate.columbia.edu/2021/04/20/art-action-climate-change/ Accessed 12 February, 2022

watercolours, ink, works on glass and bitumen, giving the impression of layers of time and of toxicity, as well as an exploration into the use of digital art.

Although some mapping principles were adhered to, as a traditional starting method for artwork construction, I believe my ‘maps’ are distortions in their abstract format. As such, even though embodying artistic licence in the production of the artworks through interpretative aesthetic decisions, they also reveal the truth of the mining sector and how damaging it is to our environment.

Choosing a research methodology between the different styles and terminology available, such as practice-based, practice-led, creative practice and creative practice as research, studio-based research, creative arts research and creative production proved to be a challenge for my particular style of working since several interpretations of these methodologies offered potential working methods that would cover what I undertook in both traditional and non-traditional forms. After much research of different scholars such as Graham Sullivan, Barbara Bolt, Estelle Barret, Andrew McNamara, Linda Candy, Lyle Skains, Hazel Smith and Roger Dean, designed to answer a directed research question about art and the practice of it which could not be answered by other methods. I have argued that my maps direct the viewer to aspects of the actual site or territory through aesthetic means – showing what is not usually found on conventional maps. Practice-based research provides us with a robust, nuanced research approach to help answer fundamental questions about practicing and performing art. By using the methodology of practice-based research and within the presence of human activity during the Anthropocene epoch, the maps submitted show in an abstract manner how humans have become the single most influential species on the planet, causing significant global warming and other changes to the land, water, organisms and the atmosphere.

After consideration of these definitions and terminologies of practice-based, practice-led and others, this project deployed the reflexive process of practice-based methodology alongside an understanding of the broader field of art practice and theory. Since my research is predominantly the submission of artworks that contribute to new knowledge, practice-based research best describes the methodology of my practice and strategy of working. Such research played an important part in forming new understandings about practice and non-traditional

research processes because placed together and combined with traditional research methods, it generated new knowledge that could be shared via an exegesis and a body of practical artworks.

Some examples of how practice-based research informed the broader research process for this project that led the direction of the practical component was the research into and subsequent identification of the shifting shorelines of Port Phillip Bay which was elaborated on in Chapter 3: Preliminary Investigations. The reflective process of creating these artworks and responding to the thoughts and actions of those processes, enabled me to shift my creative arts practice into the domain of practice-based research, and those reflective thoughts involved trying to understand the reasons for making, and why it was important to the broader field. Another example was my recollection of a recent outback trip through Tibooburra, NSW to Innamincka, SA on Cooper Creek, almost following Charles Sturt's ill-fated 1845 attempt to discover an 'inland sea'. The memory of this 'inland sea' prompted a major focus of the practice part of the research project and conceptually demonstrated the point of the original research question: 'Can mapping toxic locations through works of art, contribute to our awareness of environmental issues in the Age of the Anthropocene?

Another significant factor of practice-based research was the 'consultation and advice' component that affected the presentation for the examination/exhibition, which involved obtaining the correct height and width of the gallery space. This was sought from the University of Southern Queensland curator. This information was an important factor in placing constraints on the envisaged abstract map and in producing a map of the gallery and the artworks for viewers – directing them to the maps which in turn, direct them to the other sites, external to the maps themselves, such as the toxicity of the site. Using Jean Baudrillard's 'Precession of the Simulacra', mentioned earlier, of which there are four orders, it is envisaged that my maps may fall under the third order, where the representation precedes and determines the real. The maps don't reveal the truth but rather direct the viewer, through the maps, which, using artistic licence, 'create' the territory on the surface of the image. According to Baudrillard, there is no longer any distinction between reality and its representation; there is only the simulacrum, a substitute of one for the other.

While Google Maps show the actual site, my maps direct the viewer to what the 'real' site occludes.

The survey of the field engaged with, and elaborated upon, both the key literature, art of relevant artists, and methods of making, in particular by discussing the theoretical underpinning of Baudrillard and his theory of the problematic relationship between the real and the hyperreal and its relation to my artworks. To this theoretical position, reviewing the historical background of mapping and historical and contemporary artists whose practice is engaged with mapping, the selected geographical territories which were researched for the purposes of the artworks, were added.

Preliminary investigations of several locations in Australia were researched from which I was able to narrow down my focus. I then produced for the final submission, several artworks and digital projections that concentrated on the thesis title that reflected the toxic conditions of our mining sector, which included toxic ponds, toxic emissions and other factors that resulted in an extensive body of work. Another significant part of the contamination that our land is subject to, was, and still is, the damage to the environment by the nuclear testing at the remote location of Maralinga in South Australia during the 1950s and 1960s which has had residual effects on the land, and will be unusable for the next 10,000 years. Further research illuminated the fact that 'data mining' was an idea that could integrate well with the previous set of artworks, and could be presented as a kind of virtual or digital map or movie, and therefore use a medium more closely aligned with Baudrillard's theory.

My personal connection to the title of this exegesis is my love of travel and maps, and learning with consternation how the land that was once gradually changing, is now changing at a much faster rate. Where once there were grand vistas of our immense countryside, they are now interrupted by, enormous gas fields, fenced-off mines and great expanses of open cut mines with tailing ponds using, in some cases, large areas of bituminous pond lining. One company proudly claims that they have installed more than 30,000,000 square miles of their bituminous membrane product worldwide.[197] As well, vast areas of cleared land that has been

[197] Axter, Coletanche https://www.axter.eu/coletanche/

changed forever to construct dams and the never-ending stretches of bitumen for roadway construction. These issues were addressed in Chapter 4, Final Outcomes and the artworks documenting these concerns can be seen in Appendix B.

While all progress is inevitable, this exegesis illuminates how in the Anthropocene, changes have altered our land, and this research may well raise awareness and encourage discussion on how the damage to the land might be reversed or perhaps encourage further investigation into how technology can assist some kind of positive action. It is this idea that will take me on a new investigation for future artwork as maps.

This research project has culminated in, firstly, a preliminary exhibition in A Block gallery at the University of Southern Queensland during the month of June 2023, and a final presentation for examination in B Block gallery at the University of Southern Queensland 27 May – 28 June 2024.

A Gallery Catalogue[198] will accompany the installations as an explanatory guide to the artworks, see Appendix C.

[198] See Appendix C.

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APPENDIX A – Planning the 2023 Exhibition

I was furnished with a plan of A Block Gallery which enabled me to plan where my artwork might be exhibited, keeping in mind the lighting in the gallery and general aesthetic layout of the works submitted. The artworks to be submitted for the 2023 exhibition are included in Appendix A.

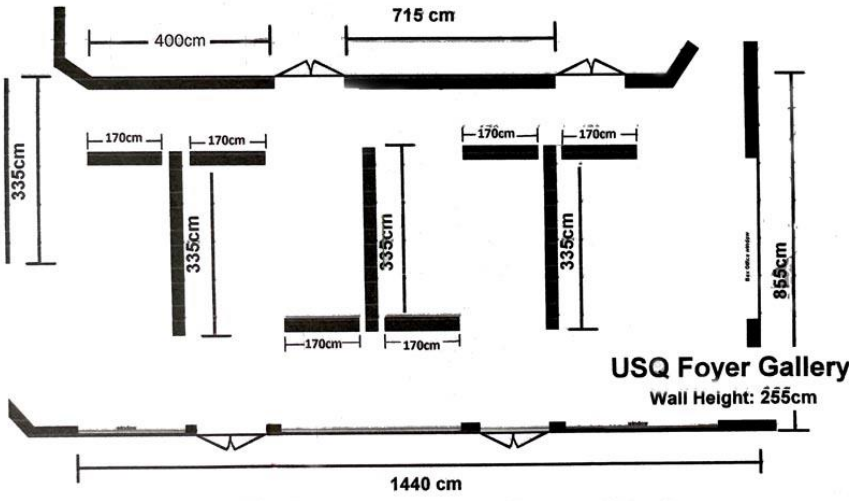


Figure A 1: Art Gallery Floorplan, A Block, University of Southern Queensland.

Earlier, I quoted the historian Simon Scharma from 'Landscape and Memory'[199] where he believed that 'every landscape – forest, river or mountain – is a work of the mind, a repository of the memories and obsessions of the people who gaze upon it' which resonated with my feelings earlier mentioned about the roads I have travelled, and how I had revelled in the memories of such experiences, and where I have used these experiences in the creation of the submitted maps. To have been able to view our extraordinary country from Google Earth, viewing those roads I have travelled and where I have sat at times, has been a truly sublime experience.

The investigations of numerous geological areas to see how landforms had changed due to human intervention were mainly focussed on within Australia. After much experimenting with different ideas, materials, supports and styles of

[199] S. Scharma, *Landscape and Memory*, (Vintage Books, Random House. USA. 1995).

presentation, the final submission shows an aesthetic interest in mapping the landform changes by the degradation to the environment. For the 2023 exhibition, I consider the works, for the moment, complete[200]. However other ideas were forming by adding extra layers of meaning to the existing artworks that became alternative lines of inquiry for the 2024 DCA presentation/exhibition. These lines of inquiry could involve further research into mines which may have implemented or completed rehabilitation programs that could add further meaning to the 'Altered States' series, and by adding these extra 'layers of information' may add value to the submitted final works. However, a conversation with my supervisor altered that idea, hence the following chapter.

The following images are from the 2023 Exhibition in A Block, University of Southern Queensland.

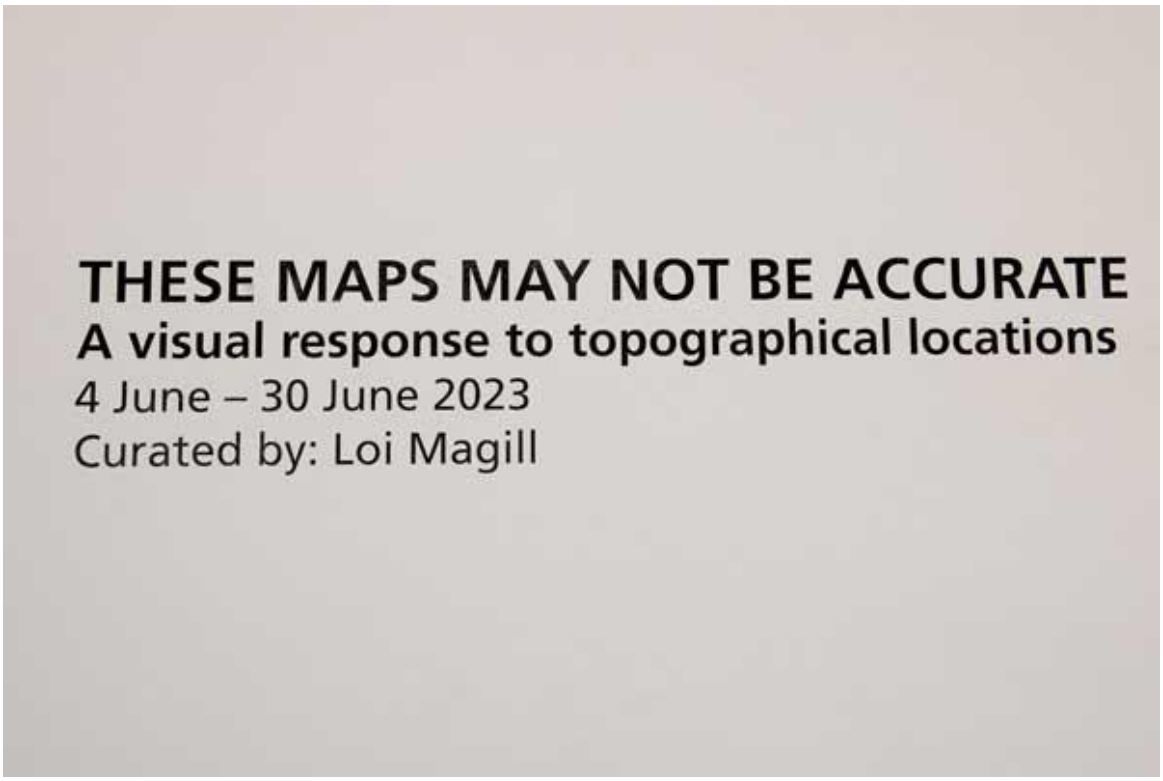


Figure A 2: Loi Magill, Title of 2023 Exhibition. Therese Hall – Therese Hall Photography

[200] NOTE: Appendix A – Images from 2023 Exhibition.

Figure A 3: Loi Magill, view of *Port Phillip Bay* images. Therese Hall – Therese Hall Photography

Figure A 4: Loi Magill, view of *Port Phillip Bay* images 2. Therese Hall – Therese Hall Photography

Figure A 5: Loi Magill, view of *Antarctic* images. Therese Hall – Therese Hall Photography

Figure A 6: Loi Magill, *Glenshera Sand Mine.* Therese Hall – Therese Hall Photography

Figure A 7: Loi Magill, view of *Inland sea* (part) and *Lake Bungunnia*.
Therese Hall – Therese Hall Photography

Figure A 8: Loi Magill, *Inland Sea* (part) and *Great Inland Sea*.
Therese Hall – Therese Hall Photography

Figure A 9: Loi Magill, view of *Altered States 1* (24 pieces). Therese Hall – Therese Hall Photography

Figure A 10: Loi Magill, view of *Toxic Ponds* (part). Therese Hall – Therese Hall Photography

Figure A 11: Loi Magill, view of *Toxic Ponds* (part). Therese Hall – Therese Hall Photography

Figure A 12: Loi Magill, view of *Land Clearing for Dams*. Therese Hall – Therese Hall Photography

Figure A 13: Loi Magill, view of *Toxic Ponds* (part). Therese Hall – Therese Hall Photography

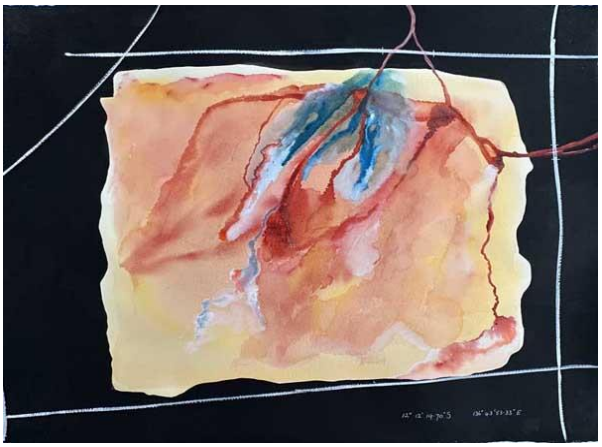
APPENDIX B – Presentation as examination

After the exhibition in 2023, ideas emerged for the final exhibition, Awful Beauty. Since the wall in B Block is higher than A Block, an extra row of *Altered States* was added to the original display in A Block. These are all individual paintings and can be re-arranged to suit lighting and personal choice.

The following images were presented for Examination in B Block Gallery, University of Southern Queensland on May 27 – June 28, 2024.

Boddington Gold Mine, WA

Glenshera Silica Mine, SA



Gove Bauxite Mine, NT

Mt Whaleback Iron Ore, WA

Maralinga Nuclear Test Site, SA

Mt. Isa Underground, Qld.

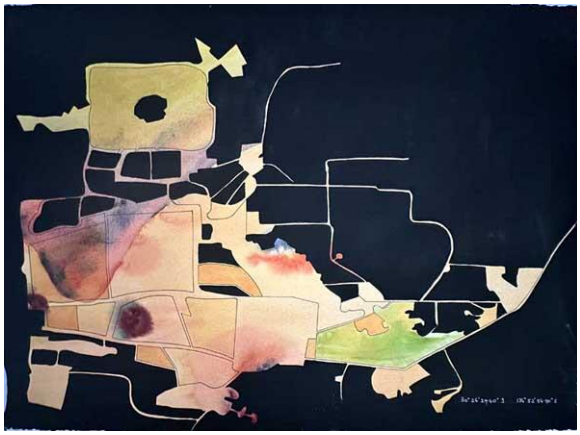
Tanami Gold Mine, NT

Worsley Aluminium Mine, WA

Nhulumby Bauxite, NT

Plutonic Gold Mine, WA

Nhulumby Tailings, NT

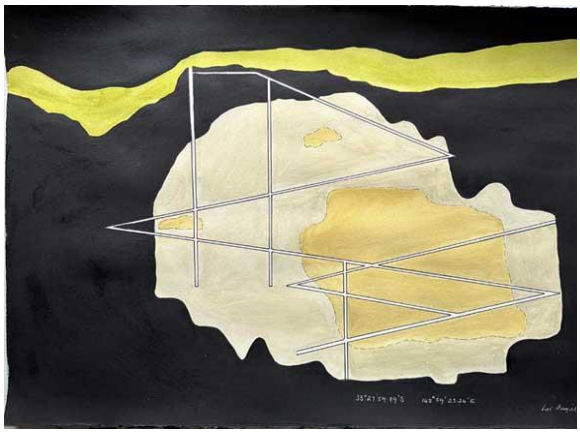


Olympic Dam, SA

Cadia Hill, NSW

Prominent Hill, SA

Telfer Gold Mine, WA



Cadia Underground, NSW

Whyalla, SA

Canberra, ACT

Darwin, NT

Melbourne, Vic

Sydney, NSW

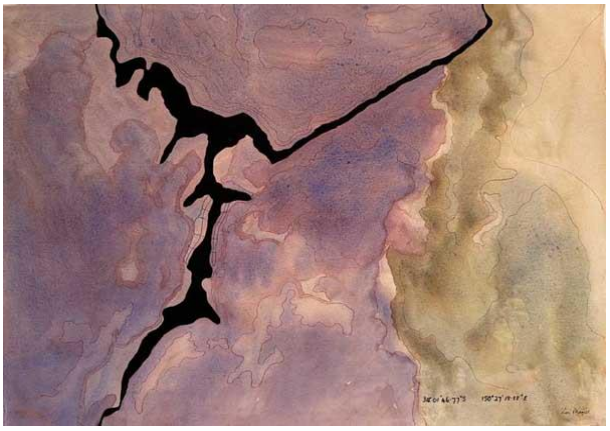
Brisbane, Qld

Perth, WA

Adelaide, SA

Eucumbene Dam, NSW

Hume Weir, Vic

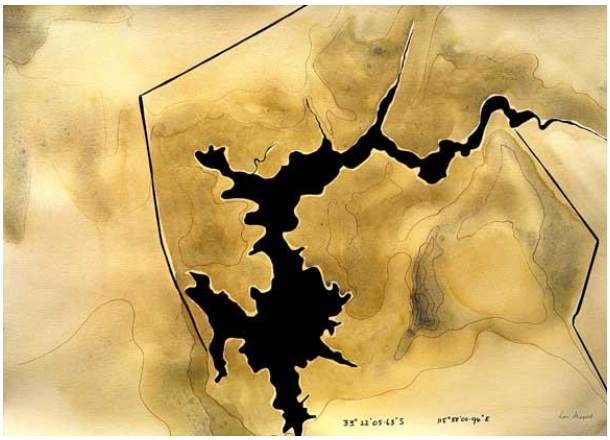


Warrangamba Dam, NSW

Dalrymple Dam, QLd

Argyle Dam, WA

Dartmouth Dam, Vic



Wellington Dam, WA

Mt Bold Dam, SA

Figure A 14: *Altered States* details of the works which make up the panel in Figure A 14.

Figure A 15: Loi Magill, *Altered States*, 2023-4, watercolour, gouache and acrylic on Arches watercolour paper, 76 x 56 cms each

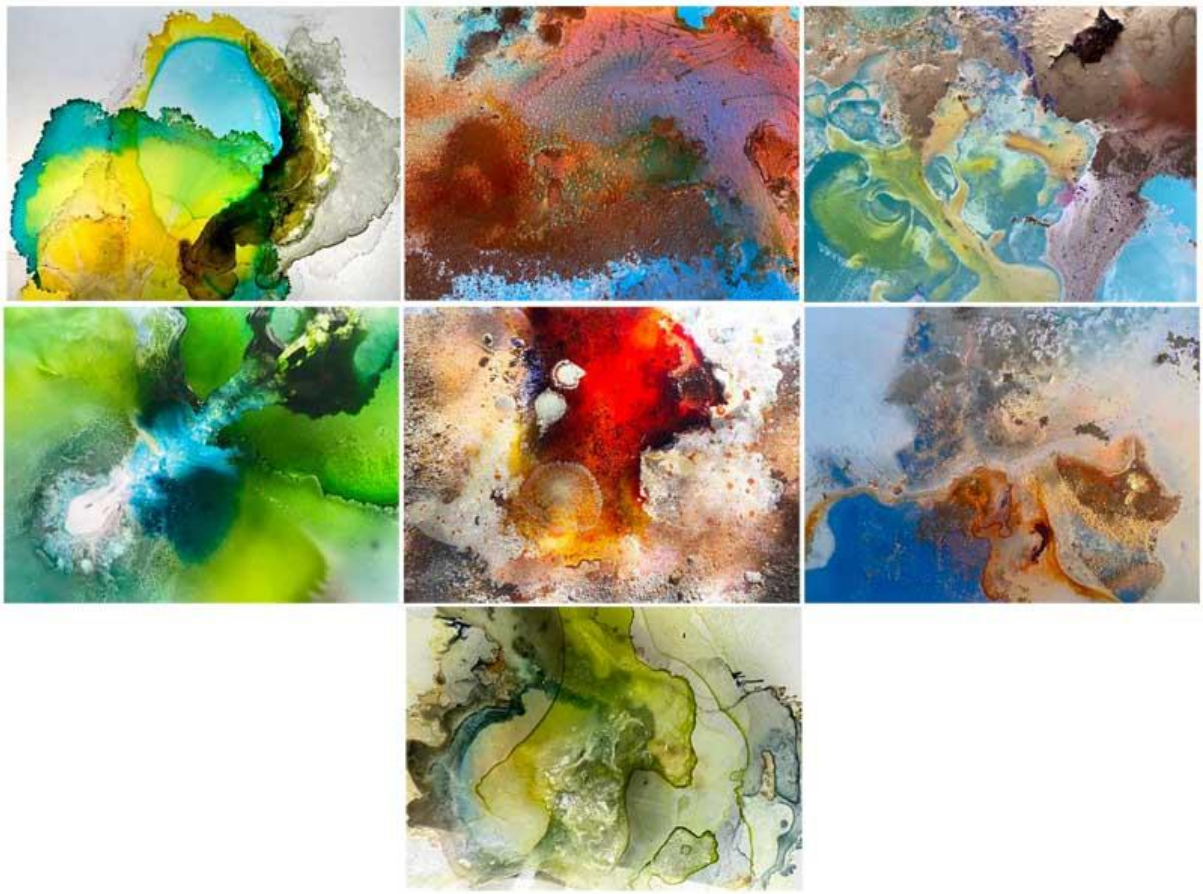


Figure A 16: Loi Magill, *Toxic Ponds*, 2023, Works on glass, printed on Ilford Metallic Gloss, each 841 x 594 mm

Figure A 17: Loi Magill, *Emissions,* 2023, screenshot of digital movie projection

Figure A 18: Loi Magill, *Toxic Pond,* 2023, screenshot of digital movie projection. Materials: soil, water, inks, alcohol, vinegar, oil, methylated spirits, vinegar and differing proportions.

Figure A 19: Loi Magill, *Toxic Reality 1* with underlay of chemical compounds, 2023, inks on Mylar

Figure A 20: Loi Magill, *Toxic Reality 2*, with underlay of chemical compounds, 2024, inks on drafting film

Figure A 21: Loi Magill, *Toxic Reality 3*, 2024, inks on drafting film, 180 x 80 cms

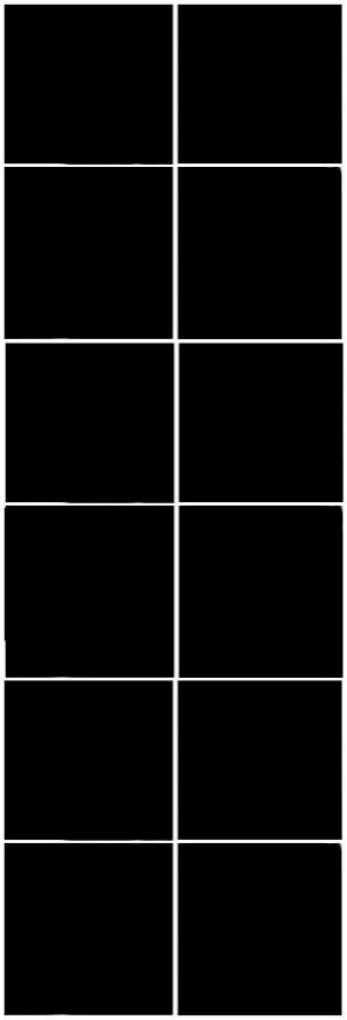


Figure A 22: Section of bitumenous boards displayed on the floor and wall of the gallery

APPENDIX C – Gallery catalogue

I have provided a ‘map’ of the gallery with descriptions of the different artworks submitted based on an official plan of B Block Gallery (Figure A 22) which will be available as handouts.

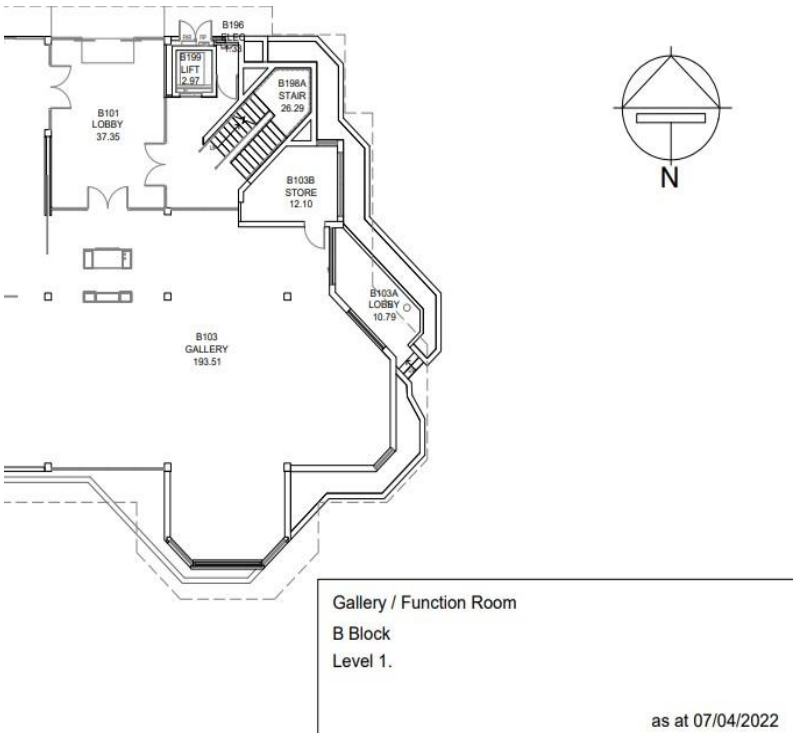


Figure A 23: Floor Plan of B Block Gallery

Figure A 24: Gallery catalogue

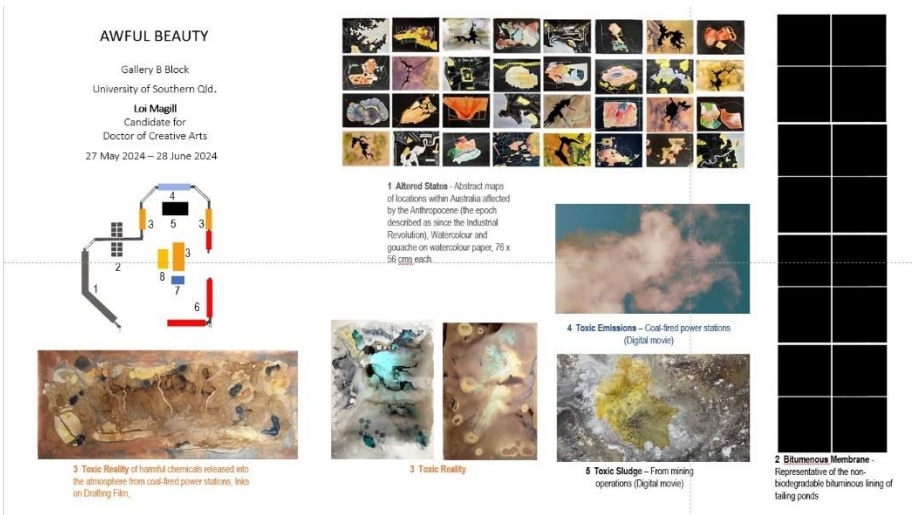


Figure A 25: Front side of gallery catalogue. The Gallery Map is printed on both sides and folded.

Figure A 26: Rear side of gallery catalogue. The Gallery Map is printed on both sides and folded.

APPENDIX D – Mylar and drafting film

What is Mylar?

Mylar is a polyester film made from stretched polyethylene terephthalate (PET) and is used for its high tensile strength, chemical and dimensional stability, transparency, reflectivity, gas and aroma barrier properties, and electrical insulation. For some time, the term Mylar has been mistakenly used as a generic term used to describe a range of different films. For example, Architects and/or Engineers use the term when referring to matte drafting film. Artists, Graphic Artists, Printers, or Document Archivists areas tend to use the term Mylar(R) to refer to high clarity plastic film in general.

What is drafting film?

Drafting film is a 100% polyester surface, used traditionally by draftsmen and architects to do plans on. These days it is a popular choice of artists as a drawing surface. It is archival, translucent, non-yellowing, stable under different temperatures and loves coloured pencil.

While it is admitted that the undesirable materiality of Mylar and Drafting Film used as art surfaces for some of the non-traditional research outputs for this Doctorate research project, they are recorded as examples of the toxic materials produced by some mining. These materials are referred to as archival but are also unbiodegradable, emphasising the underlying concern of the mining sector and its toxic outputs.

While the use of Mylar as a non-biodegradable art material is recognised as a contribution to global warming, some artworks are submitted for examination as a representative of the toxic bi-products of mining.

APPENDIX E – News reports

News Report on Telfer Gold Mine WA

Newmont suspends processing at Telfer gold mine after cracking detected on tailings facility

ABC Pilbara

By Michelle Stanley

Posted Thu 11 Jan 2024 at 1:24pm Thursday, updated Thu 11 Jan 2024 at 8:47pmThursday.

Processing operations at Newmont's Telfer gold and copper mine have been suspended over safety concerns. *(Supplied: Newcrest Mining).* A gold mine in WA's remote Pilbara has been forced to suspend its processing operations, after cracking was detected at a tailings dam on site.

- "Cracking and seepage" was discovered at a Telfer tailings dam in December
- WorkSafe has issued a prohibition notice to limit use of the dam
- Mine Safety inspectors are monitoring the situation

Newmont suspended processing at its Telfer mine, 400 kilometres south east of Port Hedland in the remote east Pilbara, on 24 December, 2023.

The company said in a statement "cracking and seepage" had been discovered on an internal embankment.

"Following initial detection of cracking, Telfer activated its response plan including closure of some work areas near the TSFs while analysis and monitoring was undertaken using radar and drone technology," it said.

On Thursday evening, a Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) spokesperson said the company had told them there were "no tailings or water seeping from the internal embankment".

"DEMIRS continues to liaise with Newmont to ensure monitoring results are not indicating any impact to groundwater quality as a result of the cracking identified in the internal embankment," the spokesperson said.

"Newmont notified DEMIRS of the cracking on 24 December 2023 and that Telfer had implemented interim measures including shutting the processing plant.

"The company provided DEMIRS with a geotechnical update on 27 December 2023, and this informed the basis of the WorkSafe inspector's prohibition notice which was issued on the same day."

Tailings dams are used on mine sites to store by-products of mining operations which can be highly toxic. Telfer is 200 kilometres east of the nearest towns Marble Bar and Nullagine.

On 6 January, Newmont's Engineer of Record signed off on the stability of the facilities impacted, but two days later, DEMIRS issued a prohibition notice limiting use of the tailings facility.

"[The prohibition notice] requires the operator to limit the use of the affected part of the tailings storage facility until repair work has been done," acting WorkSafe Commissioner Sally North said.

Mining operations at Telfer are continuing despite processing being temporarily suspended. Newmont, which was acquired from Telfer's former owner Newcrest just two months ago, has not responded to ABC questions relating to the extent and length of the shutdown. A company spokesperson said it was "liaising closely with regulators ... to facilitate safe reopening".

"Newmont will also undertake a post-incident review to determine the root cause of this issue and identify measures to prevent recurrence."

WA Premier Roger Cook described the incident as a "very concerning development."

"We expect to be able to ensure that their facility operates safely and with all of the environmental conditions in mind, so we expect them to be able to address that issue," he said. WorkSafe Mines Safety inspectors are continuing to monitor the situation.

Posted 11 Jan 202411 Jan 2024, updated 11 Jan 2024

BHP Olympic Dam Tailings: an "Extreme Risk" to Workers and to the Environment Article by David Noonan B.Sc., M.Env.St., Independent Environment Campaigner, 30 June 2019

The world's largest miner BHP proposes a major new Tailings Storage Facility (17 June 2019) at the Olympic Dam copper-uranium mine in outback South Australia. Tailings Storage Facility (TSF) 6 is intended to be larger in area than the CBD of Adelaide - at 285 hectares, and up to 30 metres in height - equal to the height of the roof over the Great Southern Stand at the MCG. BHP states the total footprint area of TSF 6 is intended to be 416 hectares. BHP are seeking federal government approval of TSF 6 under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), prior to a warranted comprehensive Tailings Safety Risk Assessment of all BHP tailings waste across the entire Olympic Dam operation. This BHP application follows on from a BHP Tailings Facilities Disclosure (07 June 2019, p.11-12) stating three Olympic Dam tailings facilities are at the highest "extreme risk" hazard category based on the consequences of a potential catastrophic failure of the radioactive tailings waste facilities. BHP and the mining industry are in serious trouble internationally over catastrophic mine tailings dam failures in South America at the BHP and Vale joint venture mine at Samarco in Brazil in 2015 and the nearby Vale Brumadinho tailings dam collapse in early 2019. In response, the International Council on Mining and Metals (ICMM) has teamed with the United Nations Environment Program (UNEP) to conduct a comprehensive Independent Tailings Review (24 April 2019) to draw up a new international safety standard for the management of tailings storage facilities. This important report and new tailings storage safety standard are due at the end of 2019. BHP's "ESG Briefing: Tailings Dams" (June 2019, p.17) states the "Principal Potential Impact" in a 'most significant failure' of extreme risk Olympic Dam tailings waste facilities is that of "Employee impacts" – with the potential loss of life of BHP employees at Olympic Dam reported at 100. The Canadian Dam Safety Guidelines "extreme risk" consequences category shows impacts: at a potential loss of life of more than 100; an extreme loss of infrastructure and economics; and a major permanent loss of environmental and cultural values - with restoration stated to be impossible (In: BHP's "ESG Briefing: Tailings Dams", p.10). BHP are seeking federal environmental approval for TSF 6 prior to availability of the new ICMM and UNEP international

safety standard for the management of tailings storage facilities. With BHP stating a preferred schedule for TSF 6 to start construction in Nov 2019 and to operate in early 2020. BHP are also seeking federal approval for TSF 6 to be held prior to and separate from a required federal and state assessment of a major proposed expansion in the scale of underground mining at Olympic Dam. With copper production to increase from 200,000 to 350,000 tonnes per year. The SA “Olympic Dam Major Projects Declaration” (SA Government Gazette, 14 Feb 2019, p.461-462) has already “excluded” the three “extreme risk” Olympic Dam tailings waste facilities, and the proposed major new TSF 6 and associated Evaporation Pond 6, from the scope of a required public environmental impact assessment process on BHP’s proposed Olympic Dam mine expansion. 2 To exclude, or to fail to apply, environmental assessment and public consultation on fundamental environmental impacts of uranium mining at Olympic Dam is contrary to the public interest, and works against transparency, scrutiny, public confidence and basic modern community expectations. The new Federal Environment Minister the Hon. Sussan Ley MP must require a public environmental impact assessment process on BHP’s EPBC Act Referral 2019/8465 Tailings Storage Facility 6 under federal responsibilities to protect Matters of National Environmental Significance (see: ENGOs Briefing Uranium Mining Triggers “Protection Of The Environment” Under the EPBC Act, June 2019). This EPBC Act public assessment must include a core comprehensive Tailings Safety Risk Assessment of TSF 6 and of all BHP tailings waste across the entire Olympic Dam operations, especially the three “extreme risk” tailings waste facilities, before any potential approval or advance of major new BHP radioactive tailings waste facilities or increase in tailings waste production output. The Minister must not approve this major new Tailings Storage Facility on the basis of limited nonindependent BHP Referral input. Significant safety and environment protection issues can-not be left to BHP to decide. BHP must be made accountable for the three “extreme risk” tailings waste facilities at Olympic Dam and made to apply the most stringent safety standards in this case. BHP Olympic Dam radioactive tailings waste present a significant, near intractable, long-term risk to the environment (see: ENGOs Tailings Briefing Paper, June 2019). The tailings at Olympic Dam contain approximately 80% of the radioactivity associated with the original ore and characteristically also retain around one third of the uranium from the original ore. Olympic Dam radioactive tailings wastes retain the radioactive decay

chains of uranium, thorium and radium and should be isolated from the environment for over 10,000 years. Since 1988 Olympic Dam has produced around 180 million tonnes of radioactive tailings, intended to be left in extensive above ground piles on-site, imposing ongoing risks - effectively forever. In October 2011 the federal government recognised BHP tailings risks are effectively perpetual, Olympic Dam Approval Condition 32 Mine Closure (p.8) sought to require environmental outcomes: "that will be achieved indefinitely post mine closure". However, these conditions were not applied to Olympic Dam as BHP abandoned a proposed open pit mine expansion project in 2012. Existing BHP radioactive tailings waste facilities at Olympic Dam are extensive, covering an area totalling 960 hectares (ha) or 9.6 km2 - an area far larger than the Melbourne City Centre of 6.2 km2. One of two active "extreme risk" tailings waste facilities at Olympic Dam, TSF 4 started tailings slurry waste operations in 1999 and is already over 30 metre in height, equal to the height of a ten-storey building at the centre of the tailings pile. TSF 4 covers an area of 190 ha - over 100 times the playing area of the Melbourne Cricket Ground, the iconic MCG. In 2015 federal approval was granted to BHP to extend the period of operations of TSF 4 into the mid-2020's and to increase the height of TSF 4 to up to 40 metres. The federal government should now require BHP to decommission this "extreme risk" facility and not to extend its use. 3 Earlier TSF No.1, 2 and 3 are now classified as a single "extreme risk" inactive facility, totalling 190 ha in area and up to 30 metres in height. These TSF are from a 1980's design and no longer receive tailings slurry waste but BHP has failed to close or to cover these radioactive waste piles. BHP Olympic Dam is an out of date "extreme risk" mining operation in sore need of high standards. Federal environmental protection standards for the management of radioactive tailings waste have been set at the Ranger uranium mine in the NT "to ensure that: (i) The tailings are physically isolated from the environment for at least 10,000 years; (ii) Any contaminants arising from the tailings will not result in any detrimental environmental impact for at least 10,000 years." This prudent approach and public interest requirement must also now be applied at Olympic Dam. Federal Environment Minister Hon. Sussan Ley MP faces a key decision test on the consistency and integrity of EPBC Act powers and responsibilities in BHP's TSF 6 Referral and proposed uranium mining expansion at Olympic Dam. The Minister's tests include acting consistently with important Department of Environment Recommendations in the September 2011 "Olympic Dam expansion assessment

report EPBC 2005/2270" (7. Existing operation, p.62), that: "…conditions be applied to the existing operation so that the entire Olympic Dam operation (existing and expanded) is regulated by a single approval under the EPBC Act". The Minister's 2019 decision must adopt Olympic Dam Approval Condition 32 Mine Closure (Oct 2011) as a requirement on BHP for a comprehensive Safety Risk Assessment covering all radioactive tailings at Olympic Dam, including that the tailings plan (p.8) must: "contain a comprehensive safety assessment to determine the long-term (from closure to in the order of 10 000 years) risk to the public and the environment from the tailings storage facility" Further, the Minister must enforce Fauna Approval Conditions 18 - 21 (EPBC 2005/2270) to help protect Listed Bird Species and 21 Listed Migratory Bird Species found in the area from mortality caused by BHP's toxic acid liquor Evaporation Ponds - that kill hundreds of protected birds each year (see: ENGOs Briefing Migratory Birds at Risk of Mortality if BHP Continues Use of Evaporation Ponds, June 2019). These strong federal EPBC Act Conditions required that BHP: "must not construct Evaporation Ponds (for the purpose of the expanded mine)" (C.19); And to: "phase out the use of Evaporation Ponds as soon as practical" (C.21) The Minister should also mandate a 100% non-negotiable bond on BHP to cover rehabilitation liabilities across the entire Olympic Dam operation - including the three "extreme risk" radioactive tailings waste facilities. BHP has avoided paying this multi-hundred-million dollar bond since taking over Olympic Dam mine in 2005 (see: ENGOs Briefing BHP Must Lodge a Bond to Cover 100% of Rehabilitation Liabilities at Olympic Dam, June 2019). For further information, see: https://nuclear.foe.org.au/olympic-dam/