

SUMMARY OF INTRODUCTIONS TO SOME OF THE OTWAY WATER BOOKS.

BOOK 25

Malcolm August 2012



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The Otway Water Books may benefit the following people:

Students of water ecology seeking an example of how groundwater extraction can impact on the environment and landholders.

Campaigners for water reform.

Water authorities seeking a better management model.

Environmentalists striving for the allocation of environmental flows and environmental water reserves.

Those people requiring an example of how groundwater extraction should not be developed.

The persons wishing to understand the connectedness between surface and groundwater in the Otway Ranges.

The laypersons believing that they can indeed make a difference when dealing with water authorities.

Those people maintaining that water extraction management should include environmental studies and scientific fact in preference to conjecture, environmental modelling and assumptions.

People seeking historical knowledge of surface and groundwater water extraction that has taken place from the Barwon Downs and Kwarren/Gellibrand aquifers.

SUMMARY & CONCLUSION (Taken from Book 19).

Pre-groundwater Extraction at Barwon Downs 1982-1983.

1. The Shalley family relied on the fact that Boundary Creek was a permanent flowing stream since 1912.
2. Numerous observation bores that were drilled in the area of the Barwon Downs Borefield were artesian, some squirting 10s of metres into the air.
3. The water tables in the district were stable with little variation between seasons and years.
4. All of the hydrological investigative studies indicated there would be serious impacts if more than 4000 ML/year were extracted from the borefield.

● **1984-1987.**

5. Pre-pumping recommendations for studies and the collection of data were ignored and never implemented.
6. The recommendations to establish environmental flows were also ignored.
7. Boundary Creek extended periods of no flow for the first time since 1912.

1987-2012.

8. In 1987 artificial recharge attempts along Boundary Creek found that this was a waste of time, the Big Swamp was always saturated, overflowing and no more water could be forced into it. The overflow into Boundary Creek was the reason for an average daily summer flow of 3.2 ML.
9. Local knowledge, concerns and recommendations largely ignored during the Stage One Borefield development.
10. The word “annual” in the Permissible Annual Volume (PAV) was omitted and replaced to read Permissible Consumptive Volume (PCV). This gave justification to the authorities to “fiddle the books” as far as Boundary Creek flows were concerned. The PAV was 4000 ML/year and this was calculated to have “mild” effects on Boundary Creek. Anything over this 4000 a year and the creek was expected to encounter serious environmental problems. Changing the PAV to a PCV would allow the 4000 ML/year extraction to be averaged out over a set period. Consequently a 20 000 ML/year licence could be justified with no more than 80 000 ML over a ten year period and 400 000 ML over 100 years. To make things worse the ten year period worked in such a way that in the 11th year the 1st year of extraction could be left out of the calculations. In the 12th the 2nd year of extraction figures were no longer used to calculate the 80 000 ML extraction over ten years.
11. Drawdown “holes,” or cones of depression, began to appear in the deep water aquifer in various locations.
Several cones of depression some distance from the one borefield seemed impossible. However, extensive correspondence with Southern Rural Water and Barwon Water indicates that the residual drawdown charts showing this phenomena in the yearly reports since 2004, is quite in order and acceptable.
12. Many artesian bores stopped flowing.
13. Platypus, blackfish, trout and other water dependent species died out.
14. The Big Swamp began to dry out in its upper reaches with dramatic vegetation changes.
15. Fire caused serious problems in this previously saturated area of peat.
16. Maintenance of Stream Flow Trigger Levels were regularly breached.
17. Supplementary flows into Boundary Creek from the Otway to Colac Pipeline consistently disappeared into the Big Swamp during no rainfall periods.

18. Over the years Barwon Water had carted free of charge numerous tanker loads of fresh water into the Shalley farm to maintain it as a viable enterprise.
19. A 2006 study recommending environmental flow allocations for Boundary Creek was farcical.
20. Applying the Rick Evans Response Ratio confirms that Boundary Creek should run dry as a result of groundwater extraction.
21. The Rassam et al. findings suggest that this impact overflow into the Big Swamp and Boundary Creek could be many times worse than that calculated by Evans.
22. The Big Swamp and Boundary Creek are heavily polluted from influences taking place within the Big Swamp.
23. Creeks to the north and south of the Boundary Creek Catchment continue to maintain their integrity, flowing freely and supporting healthy wetlands.

CONCLUSION.

There can be no doubt that the Boundary Creek Catchment in the vicinity of the Big Swamp was a thriving and healthy wetland before groundwater extraction took place at the Barwon Downs Borefield. From the Big Swamp to the confluence with the Barwon River, Boundary Creek supported a diverse collection of water dependent flora and fauna. Platypus and blackfish were abundant, animals high in the food chain. The Big Swamp wetlands were “jungle” like supporting many water dependent species. Farmers downstream had a secure and reliable source of fresh water. The flood plains maintained a green summer pick for stock and the stream banks maintained their stability. The boggy dense wetlands did not have to be fenced out as domestic stock would not enter the treacherous peats. Numerous attempts to drain these peaty Big Swamp wetlands had failed. These things were known to have remained relatively stable since 1912. Until 1984 the waters of Boundary Creek had been the salvation to farmers through many serious droughts. Farmers with stock water bores found them to be as reliable as the creeks in the area.

Up to 1986 groundwater levels had varied very little. From this time on the Barwon Downs area has seen a dramatic decrease in water tables. Comparative deep water artesian bores in the Loves Creek Catchment, just south of the Boundary Creek Catchment, have maintained relatively stable water tables to the present day, February 2010.

During the 1982-83 drought Geelong was in desperate need of an additional water source. Groundwater from the Barwon Downs borefield was Geelong’s salvation but started a series of events that has left Boundary Creek and the Big Swamp in a shockingly degraded state. Firstly the flows in Boundary Creek began to decrease and then dry up for short periods. The more water that was extracted from the borefield the longer the period of dry days for the creek. The water table was dropped to such a degree that the Big Swamp then started to dry out. The peat caught on fire, was hard to extinguish and was to become an ongoing area of concern. Vegetation in the big swamp began to die and the area of impact started to spread downstream killing the vegetation as it went. The acid levels in Boundary Creek sky rocketed to killer levels for instream animal life. River flats began to dry out and a summer pick for stock disappeared. Creek banks began to crumble and at least one farmer’s stock water bore became unreliable.

A stream flow maintenance trigger level was being breached on numerous occasions. Supplementary flows released from the Otway to Colac pipeline were seen as the solution to the huge drawdown of the water table under Boundary Creek and the Big Swamp. However, as quick as the water was being released from the Otway to Colac pipeline it would disappear into the depleted peats of the Big Swamp. Boundary Creek would remain dry until excess runoff was experienced during substantial rainfall events.

Throughout this period of changing circumstances the long standing local landholders appeared to be largely ignored, treated with contempt or given token involvement by the regulatory authorities.

Over the decades social and environmental studies and recommendations that would have easily identified the impacts of groundwater extraction were never implemented. Throughout this period poorly designed environmental study briefs supported by half hearted political will ensured that inconclusive results were always obtained. Each environmental report made similar recommendations to the ones made earlier. At best, the authorities were able to state that the studies were being conducted even if in large part they were inconclusive and of little use .

Streams and wetlands in catchments to the north and south of the Boundary Creek Catchment have maintained a basic integrity despite the latest extended drought. All reports state that the streams in these three catchments gain their summer flows from excess overflow from the deepwater aquifer. The source of water for the various branches of this aquifer being rain falling onto the exposed aquifer sands of the Barongarook High. If drought was the major factor causing such impact in the Boundary Creek Catchment it is more than reasonable to expect the same degree of impact in the adjoining catchments to the north and south. This is not the case. 50, 40 and 30 metre drops of the water table in observations bores in the Barwon Downs borefield area are not happening in the adjoining catchments.

Numerous hydrological reports, including Barwon Water's own consultant Sinclair Knight Merz, predicted the devastation that could be caused from pumping more than the Permissible Annual Volume. Both Barwon Water and Southern Rural Water chose to ignore this fact and proceeded with licence extraction rates 5 times this Permissible Annual Volume limit.

Even before the Stage One licence was issued in 1995 the danger signs from an economic, environmental and social perspective, were already becoming apparent and it should have been obvious that things were going terribly wrong. Acid levels were rising, the creek was drying up, vegetation was dying, farmers were running out of otherwise reliable water, summer feed on the flats was diminishing, creek banks were crumbling and platypus had disappeared from the creeks.

Piecing together a multitude of data from a wide variety of sources clearly demonstrates that the severe and detrimental impacts experienced along Boundary Creek and in the Big Swamp can squarely, convincingly and directly be related to the groundwater extraction from the borefield at Barwon Downs.

The following summarised introductions from the Otway Water Books found at the website www.otwaywater.com.au give a broad brush outline of the social, economic and environmental impacts and issues experienced along Boundary Creek in the Otway Ranges.

BOOK EIGHT (October 2008)

“One Giant Environmental Footprint.”

The Barwon Regional Water Authority has been extracting large volumes of groundwater from the Gerangamete Groundwater Management Area on and off since the drought of 1982–83. The water is extracted between 500 to 600 metres below ground level, at the Barwon Downs borefield. It is treated and then conveyed and used in the Greater Region of Geelong. The environmental and social impacts of this pumping regime have been profound. Since Barwon Water had indicated that it was going to begin test pumping from a borefield at Kwarren with the aim of extracting 16 000 ML/year, Barwon Water’s Sustainable Management Practices came under scrutiny from the Kwarren and Gellibrand community residents and landholders.

This scrutiny indicated that there had to be a monumental shift in Barwon Water’s so called sustainable groundwater management practice before extraction of any kind could be allowed to proceed at the Kwarren or any other borefield.

Earlier books provide documentation and referenced material that clearly shows groundwater extraction from the borefield at Barwon Downs has had a profound detrimental effect on the area surrounding this borefield. There are a number of indicators presented in this book that suggest the detrimental sphere of influence maybe more severe and covering a wider area than first thought. Regardless, it was blatantly obvious that a full and comprehensive review of groundwater extraction in the Barwon Downs area is long overdue and this review should be conducted before any work at the Kwarren Borefield commenced.

BOOK NINE (September 2009)

“Barwon Downs Borefield Flora Studies 1986-2009.”

In the late 1980s the Government of the day repeatedly stated that the extraction of groundwater, unlike surface water impoundments (dams), did not create environmental problems. Consequently the Geelong and District Water Board (now Barwon Water) was encouraged to develop the Barwon Downs borefield.

“Because the use of groundwater usually has few adverse environmental effects, it is often favoured over surface sources which can have marked effects.”

(Report No 18 Department of Water resources, June 1988.)

Unfortunately it has been found that there can be serious impacts when groundwater is extracted faster than it can be replenished. Streams, springs and wetlands begin to dry up; potential acid sulfate soils can become a major concern and there is substantial argument to support the notion

that salinity problems can result. These problems impact on both the well being of humans and the environment.

This book highlights detrimental impacts that have resulted from groundwater extraction along Boundary Creek at Yeodene and presents an entirely different result to the published results of a study conducted by Sinclair Knight Merz on behalf of Barwon Water.

Barwon Water released a media statement regarding the Sinclair Knight Merz report (April 23, 2009. REF: 063/09) that was headed “**Flora study inconclusive.**” It will be demonstrated that conducted differently, this flora study would have had another and more plausible result. If the “*conducted field surveys, reviewed groundwater levels and assessed new and previous data,*” had been completed as suggested in this flora study, the results would have been totally different.

This Barwon Water Media release contains half truths, misleading information and incorrect statements that masks some incredibly poor research.

However, the most damning indictment being that the flora study recommendations made in 1986, 1993 and 2002 were never implemented. As a consequence decades of crucial, comparative baseline data has been lost.

A compelling case is presented that the groundwater extraction licence at the Barwon Downs borefield must be reviewed immediately. This review cannot be left until 2019 when Licence Number 893889 expires. Social and environmental impacts cannot be allowed to continue for another 10 years.

BOOK TEN (November 2009)

“Waves of Obfuscation.”

(Obfuscation – stupefy, bewilder, muddle, confuse, obscure,)

Considering that the planned borefield investigations at Kwarren were to be conducted in a similar fashion to the 1987 Barwon Downs borefield investigations, eight groups of local residents appealed against Southern Rural Water’s October 2008 issuing of a licence to Barwon Water to conduct a test pump of groundwater at Kwarren.

Otway Water Book 10 is a continuation of this story and is a compilation of studies, irresponsible actions, cover-ups and failures to act.

(P.S. In 2009 Barwon Water withdrew its application to pump at Kwarren 24 hours before the VCAT hearing was to commence, bringing about the postponement of a \$200 million development.)

BOOK ELEVEN (February 2010)

“Boundary Creek and the Big Swamp.”

This book examines and discusses the available data on the connectedness between the surface and groundwater flows of Boundary Creek and the Big Swamp. The Otway Water books preceding this one have dealt with...

- Extensive groundwater extraction – followed by Boundary Creek drying for the first time on record.
- Pre-pumping environmental studies not done.
- Studies post pumping inadequate, inaccurate and based on dubious information.
- Decades of flora recommendations largely ignored.
- Permissible Annual Volume recommendation for groundwater extraction being exceeded by a factor of 5.
- Southern Rural Water granting a 15 year groundwater extraction licence.
- Licence conditions being broken.
- Licence not scrutinised, reviewed or adequately policed by Southern Rural Water.
- Local knowledge largely being ignored.
- Platypus colonies being wiped out.
- Blackfish and other instream life forms decimated by acidic waters and no flows.
- Springs and wetlands drying out.
- Intensity and incident of fire dramatically increasing.
- Environmental flows not being allocated.
- Supplementary flows released into Boundary Creek and then disappearing into the depleted aquifer.
- No consideration being given to stygofauna (groundwater life forms), and
- the evidence pointing to a serious Actual Inland Acid Sulfate Soil problem.

If planned studies determine conclusively that there are Actual Inland Acid Sulfate Soils (AIASS) present in the Big Swamp the next step will be ascertaining the cause. Considering the extended drawn out periods taken by statutory Government authorities to commence and conduct such investigations this could take a considerable amount of time. Even with extensive circumstantial evidence that there is an Actual Inland Acid Sulfate Soil (AIASS) problem in the Big Swamp area the site has only been visited by representatives of the Colac Otway Shire (as at February 2010). Over 12 months earlier the first written formal complaint was sent to the Environment Protection Authority (Geelong). Formal complaints were also sent to the Department of Sustainability and Environment, Barwon Water, the Colac Otway Shire and Southern Rural Water. The Corangamite Catchment Management Authority was also consulted. The only authority to be proactive has been the Colac Otway Shire. Other authorities didn't bother to reply; said there wasn't an identified problem; stated it was someone else's responsibility or indicated investigations will be carried out in the future.

If authorities are so tardy investigating formal complaints of toxic acidified, heavy metal laden waters along Boundary Creek, it is anticipated that investigating the cause would take considerably longer. Pre-empting that Actual Inland Acid Sulfate Soils will be proven to exist along Boundary Creek this Book looks at the historical data available in an effort to determine the reasons for the creation of these soils. Also some of the commonly accepted ideas put forward by these very same statutory authorities are challenged.

“The Threat to Permanent Freshwater Peat Swamps & Wetlands of the Gellibrand River and Barongarook Creek Catchments – Otway Ranges.”

Inland Acid Sulfate Soils (IASS) is a newly recognised problem for soils on the Australian continent. Coastal Acid Sulfate Soil problems have been part of Australian history for many years. However, because of the severe and extended drought over the last decade previously saturated, innate Inland Acid Sulfate Soils have dried out and been exposed to oxidation causing serious ecological, social and engineering structural problems. Leaders in the area of Inland Acid Sulfate Soils began their serious studies in the 1990s.



Big Swamp IASS 2009

When a possible site of Inland Acid Sulfate Soil was recognised in 2008 in a freshwater peat swamp and wetland in the Otway Ranges, a site that appeared to be producing large amounts of sulphuric acid, toxic gases and heavy metals, Victorian State Government authorities were asked to investigate this occurrence.



Concrete cancer from acid waters.

Every indication pointed to groundwater extraction as the culprit. After 15 months of inaction by responsible authorities, a dedicated group of concerned Otway residents decided to seek the necessary expertise to conduct a comprehensive evaluation of the site. The site being situated along Boundary Creek in the vicinity of the Big Swamp freshwater peat wetlands of the Barwon River Catchment, Otway Ranges, Yeodene, Victoria, Australia.



Boundary Creek after March 2010 peat fire in the Big Swamp-supplementary water released from the Colac Otway Pipeline disappears into the depleted wetland.

In an attempt to ascertain the potential risk to permanent freshwater wetlands in the Gellibrand River Catchment of the Otway Ranges, sites outside the direct drawdown effect from the Barwon

Downs groundwater extraction, were also included in the Inland Acid Sulfate Soils study. These additional sites are located in the Loves Creek and Barongarook Catchments.

A concerted effort failed to source studies specifically dedicated to freshwater peat swamps and wetlands. Studies that were found on Inland Acid Sulfate Soils were not peat swamps and seemed to concentrate on the causal factor being the extended drought of the late 1990s and early 2000s. However, the major causal factor along Boundary Creek pointed to the extensive extraction/mining of the deep water aquifer at Barwon Downs. It would also appear that the Big Swamp was unique in that it was a freshwater site and as a consequence could reasonably be named as a Freshwater Inland Acid Sulfate Soils site.

Chapter three of this book summarises the scientific research undertaken by the Environment Analysis Laboratory of Southern Cross University (March 2010) in the Big Swamp freshwater peat wetlands. This research also identifies several nearby permanent freshwater peat swamps and wetlands in the Barongarook Creek and Gellibrand River Catchments of the Otway Ranges that would be under threat if other groundwater extractions were to be conducted and managed in the same fashion as at the Barwon Downs Borefield.

The first chapter of this book explores the work of Professor Lance Endersbee and its applicability to the Freshwater Inland Acid Sulfate Soils of the Gerangamete and Gellibrand Groundwater Management Areas. Endersbee presents a radically different explanation for the origins of the water held in deep water aquifers. His convincing arguments challenges the 150 year old theories on which much of today's hydrological work is based.



Three wetlands under threat – in Barongarook Creek Catchment, within a few kilometres of Colac.

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BOOK FOURTEEN “The Impacts from the Big Swamp Drying Out.” (May 2011)

INTRODUCTION

The Big Swamp was a wetland along Boundary Creek, a tributary of the Barwon River located in the Otway Ranges of Victoria, Australia. In a saturated anaerobic condition the combination of iron, anaerobic bacteria, sulfur, temperatures around 10°C and a plentiful supply of organic matter, the production of significant quantities of pyrite accumulated in the Big Swamp. Over eons the flora and fauna of the Big Swamp evolved, flourished and



peacefully survived under these saturated conditions. However since 1984, as the peat in the Big Swamp progressively dried out the environment began to undergo massive changes. The ecosystems that had existed for living memory eventually began to disappear. The impacts and destruction of the wetlands in the Big Swamp have been dramatic, complete and far reaching.

This Otway Water Book attempts to demonstrate the multitude of impacts and destruction that have taken place to social, economic and environmental values.

BOOK FIFTEEN “FIRE and the Big Swamp” (April 2011)

INTRODUCTION

There can be no doubt that the Black Saturday fire in 2008 was a catastrophic event. On this same day a wind change prevented a fire that originated in the Camperdown region, from reaching the Otway Ranges. It was an extremely close call. If this fire had started closer to the Ranges the Black Saturday scenario would have been repeated in the Otways. Difficult to defend terrain and combustible forests would have seen massive social, economic and environmental impacts.

Due to the climate changes taking place, similar conditions as experienced on Black Saturday are predicted for the future. Combine a smouldering peat fire in the Big Swamp wetlands that has been burning underground since 1997 with a Catastrophic Fire Danger Index day and a resulting wildfire starting early in the day, may well make the Black Saturday blaze seem insignificant. The Big Swamp wetlands are situated on the northern edge of the foothills of the Otway Ranges.

A wildfire originating from the Big Swamp on a Black Saturday type day would be at the Bass Strait coast within hours. The usual afternoon south west change would then turn the fire and drive the flames along the coast and into the outskirts of Geelong (see page 10). This could happen within hours and most certainly all on the same day – early morning at the Big Swamp, by lunch time at the coast and approaching Geelong in the evening.

This book gathers together statements and data that clearly demonstrate that this is a distinct possibility.

BOOK SIXTEEN “Coal Seam Gas in the Otway ranges and District” (September 2011)

INTRODUCTION

A common factor in all Coal Seam Gas extractions where there is an aquifer involved, as in the Otway Ranges & District, is the utilisation of huge amounts of water. For a resource that is already fully allocated and in most instances over allocated, the introduction of Coal Seam Gas (CSG) into the equation spells disaster on a massive scale for the Otway Ranges & District. The multitude of risks and impacts peculiar to Coal Seam Gas extraction does not bare thinking about.

A Coal Seam Gas exploration licence has been issued by the Department of Primary Industries, State Government Victoria, for the Colac and Otway District Area. Licences have also been applied for that cover the Corangamite, Mortlake, Warrnambool, Portland and Nelson map areas.

The risks and detrimental impacts that Coal Seam Gas extraction inflicts upon social, environmental and economic values are many, and well documented. So much so that France came to the realisation that Coal Seam Gas extraction had to be banned. Moratoriums are presently in place in South Africa, Quebec, New South Wales, New York State, New Jersey and Pennsylvania. It is also extremely well documented in Queensland that Coal Seam Gas extraction has a raft of detrimental impacts.

In the Otway Ranges & District and particularly in the Upper Barwon River, the Loves Creek and the Gellibrand River Catchments, the ground and surface waters have already been over allocated. Simply put, even before any Coal Seam Gas extraction takes place, there is insufficient water to meet present demands, especially in dry periods of high need.

As a consequence of this over allocation of the Otway Ranges’ water resources,

- Streams have been dried up and cease to flow,
- Wetlands and water dependent ecosystems have been decimated,
- Farming enterprises have been compromised,
- Toxic amounts of acid and heavy metals have been produced polluting streams and aquifers,
- Stygofauna (groundwater life forms) has been placed in jeopardy,
- Fire intensity, duration and threat have increased incalculably,
- Volumes of carbon have been released into the atmosphere,
- Subsidence has taken place,
- Corrosion of infrastructure is a reality,
- Recreational pursuits and safety compromised, and
- Toxic gases produced.

BOOK SEVENTEEN (February 2012)

“Truth, Honesty & Integrity or the Slippery Dance of the State Authorities. Time for a bureaucratic revolution.”

Even though this book reveals and exposes alarming shortcomings of governance within an isolated area of the State of Victoria, it is none the less of serious consequence and concern to the social, environmental and the economic wellbeing to a significant area of Victoria in the Otway Ranges. Whether this is indicative of a wider problem will be for others to judge.

Pre the 1990's most government authority staff included expert personnel within their ranks capable of carrying out and maintaining their areas of responsibility without fear or favour. However, by the end of the 1990's this was no longer the case. Increasingly government authority staff have been cut back. Unfortunately, it has been the experienced expert staff and the workers at the “grass roots” level that have been sacrificed.

This has been acknowledged by the Liberal coalition party when in September 2010 it had the following to say, “*Put simply the Government does not have the skills to manage groundwater in the state effectively.*”^{“(43)”}

Throughout this turmoil of staff changes and cutbacks the “desk sitters” and “kingdom builders” have been able to maintain their jobs and status. Consequently whenever there has been a need for studies, research and projects to be conducted the authorities have had to contract the work out to private enterprise or semi government bodies. On the surface this competition would appear to be in the best financial interests of the public purse, but this is too often at the expense of honesty, integrity and thoroughness. It takes a game and financially suicidal company to return with findings that do not reflect the wishes of the contracting authority. In some cases the contracting brief is so tightly defined that the restricting scope of work prevents a true and honest assessment of the situation.

Community involvement in such projects has come to be seen by the authorities as meddling and community participation can now be best renamed “community tokenism.” When and if reports are made available any lay person scrutiny or criticism of findings is not tolerated, never encouraged, is often ignored and belittled.

Whenever an authority is persistently pursued with what would appear to be a reasonable criticism, a barrage of evasive strategies is then employed. These avoidance strategies are well versed and in most cases cause the pursuer to give up in despair wondering what is the use of trying. Lack of funds, not our responsibility, extended delay to requests, we will get back to you and never do, are some of these tactics employed.

With this all said and done there would appear to be sufficient law, acts of government, guidelines and policy to adequately deal with the devastating issue of water extraction in the Otway Ranges, to ensure that the groundwater resource is managed responsibly and in a sustainable fashion. However, the implementation of these documents by the authorities goes nowhere near delivering their intended outcomes.

Some may ask, “Can you summarise the contents of this book?” When the State Ombudsman officer asked to have thirty pages of a formal complaint over queries and breaches of the Barwon Downs Borefield licence summarised, he was told that the thirty pages was a summary. In a similar vein this book is only a fraction of the complete story.

BOOK EIGHTEEN "The Boomerang Swamp" (July 2012)

Introduction.

In a 1994 report the Boomerang Swamp was described as a rare high quality example of a greater than regional botanical significant swamp in an unmodified catchment. Unfortunately, since then this swamp has undergone a significant and dramatic decline to such a degree that this pristine swamp no longer supports very rare and significant vegetation.

When the swamp was resurveyed in the early 2000s, the 2002 report could not determine whether drought and or groundwater extraction was the cause of such a dramatic decline.

This book examines some of the decisions made going back as far as 1986 and questions whether they were made in the best interests of the survival



of this swamp. The question is posed that decisions made were not based upon sound scientific evidence.

It is argued that if current scientific knowledge of the time was taken into consideration the decisions made would have been markedly different and perhaps this swamp would have remained a site of State botanical significance and not become another Actual Inland Freshwater Acid Sulfate Soil site.

Introduction

Historically the approach used to determine the sustainability of groundwater extraction at the Barwon Downs Borefield has been based purely on hydrological properties. Pumping from this deep water aquifer is regarded as sustainable until there is no more water that can be extracted.

The word “sustainable” gives the impression that some action can be repeated over and over again where the impacts on the resource being exploited are minimal. The resource can be tapped into indefinitely without causing serious problems. In many cases the use of the word conjures up the mental picture that there will be no impact or such a small one that it really doesn’t matter. An example highlighting the inadequacy and failure of this type of approach is most apparent along Boundary Creek in the vicinity of the Big Swamp wetlands, Yeodene, Victoria, Australia. For many years Boundary Creek has been within the area of influence created by the cone of depression resulting from the Barwon Downs Borefield groundwater extraction. The extraction bores have not pumped the aquifer dry, and under the historical definition used, the groundwater extraction at the Barwon Downs Borefield is seen to be sustainable. However, the environmental, social and economic impacts at the surface have been quite profound.

This method of determining sustainability is an outdated definition and most often ignores natural geochemical interactions between groundwater and aquifer sediments, and between aquifers and overlying soils including groundwater and surface water dependent ecosystem requirements. In actuality, in October 2010 the Victorian Auditor General’s Office (VAGO) found that the Victorian Department of Sustainability and the Victorian Water Corporations did not know whether groundwater extraction was sustainable or not.⁽⁵⁹⁾

“The Department of Sustainability and Environment (DSE) and water corporations do not know whether groundwater use is sustainable.”

If the 30 years of researched data referred to in this document has any foundation then this book demonstrates that as a result of the groundwater extraction at the Barwon Downs Borefield, Boundary Creek and the Big Swamp have been changed from a perennial and saturated water system to an ephemeral one.

Figures and material referred to in this book have been sourced from the best available and confirmed data.