SUPPLEMENTARY SUBMISSION No. 141

AUSTRALIA IS A LAND OF MANY CONTRASTS. WHERE MAN CAN WALK THROUGH SUCCULENT COASTAL RAINFORESTS, OVER SNOW CAPPED MOUNTAINS AND ACROSS DRY DESERT PLAINS.

BUT EVER SINCE EUROPEAN MAN FIRST SET FOOT ON THIS GREAT LAND HE HAS STILL NOT FOUND A WAY TO OVERCOME THE HUGE ENVIRONMENTAL AND ECONOMIC LOSSES CAUSED BY THREE EXTREME FORCES OF NATURE THAT PREVAIL.

DROUGHT, SALINITY AND FLOODS

THESE CONTRASTING DRAMATIC EVENTS CONTINUE TO THREATEN THE LIVELIHOOD OF THIS MAGNIFICENT COUNTRY AS THEY HAVE DONE FOR HUNDREDS OF YEARS.

YET THE FORCE THAT DRIVES THEM IS ALSO THE MOST ESSENTIAL LIFE SOURCE KNOWN TO MAN.

WATER

MAN HAS ALWAYS KNOWN THAT LIFE DEPENDS ON WATER AND WE ALSO KNOW THAT IF YOU CAN HARNESS THE WATER YOU CAN CONTROL THE ENVIRONMENT AND WITH CAREFUL MANAGEMENT YOU CAN SECURE THE FUTURE

SO WHY, AFTER ALL THESE YEARS, HAVEN'T WE FOUND A WAY TO CONTROL AND DIRECT THIS VITAL RESOURCE?

In the past when man was confronted by a problem, the answer began with an idea that gave birth to a plan. However ultimately, the practical solution would be found in the hands of the engineer. He was both practical and objective and with his range of unique skills, problems were solved and we made progress.

But since those early days, despite all the technological marvels that surround us, featuring incredible structures and systems that constantly bear witness to the skill of a good engineer, engineering has now evolved into an open-ended profession. So much so that now, when confronted by a logistical problem, the responsibility to provide a practical solution is placed in the hands of a variety of professions.

In some cases, scientists, biologists and even palaeontologists have infiltrated what was once clearly the role of the engineer. Perhaps with that evolutionary aspect, the strength of man's ability to solve problems has become diluted and the quest to find a plan that will effectively harness and control the water has now become bogged down by a complex academic exercise. One that embraces a multitude of conflicting and competing opinions and simply serves to muddy the waters, destroying man's clarity of vision and his ability to reach a successful conclusion.

It would appear that in the process we have created an industry of academic, vested interests, often financed by government and in some cases the motivation to find an answer could be handicapped by the need to safeguard lifetime careers.

For instance, the 'Wentworth Group', a collection of various scientific, academic and political interests, has been very critical of that great engineering achievement, the Snowy Mountains Hydroelectric Scheme.

Yet the Scheme's engineers produced a well-planned project that met all the expectations of the original design criteria. They supplied the water needed to turn a once rabbit-infested, parched land, from which First World War veterans had walked away, unable to make a living, into a very productive agricultural area.

In fairness to those critics who possess the benefit of hindsight, perhaps the engineering brief should have been extended to devise systems that went beyond the delivery and application of the water and the control of the water table levels to encompass salination, evaporation and siltation. But it didn't and such criticism by the Wentworth Group denies the Scheme's undeniable and magnificent achievements.

It is obvious that those who came before us, had they possessed the same benefit of hindsight, would have broadened the criteria and extended the brief, so that all of these perceived problems would have been rectified in accordance with the calculated design criteria, allowing the engineered solution to be an even greater triumph.

But the year is now 2003 and Australia has witnessed the perverse devastation that drought and floods can inflict and the huge resulting financial burden carried by this nation. Not just once but over and over again.

We have also seen the creeping progress of salinity and how it has cruelly turned what was once productive land into arid, useless desert. Surely it is time to cease the great debate and return to what we do know about solving problems and what in the past has served us so well.

We have just endured yet another long and devastating drought. We have seen those hardened faces of our farmers crumble before our eyes. We have also seen the force of nature turn full circle and with the ultimate in cruel irony leave regions flooded in its wake.

While the great debate continues surely there is one thing we might all agree on.

WE NEED AN ANSWER NOW!

WATER FOR AUSTRALIA PTY LTD
PRESENTS
THE ENVIRONMENTAL PLAN TO SECURE AUSTRALIA'S FUTURE

INTRODUCTION

This is an alternative view to that of the Wentworth Group and we are extremely confident that the plan that follows does provide an answer to Australia's water and salinity problems. Perhaps, more importantly, it is one that not only harnesses and controls the water that flows both under and over the ground, but it is cost effective and encompasses all the environmental requirements critical to best practice management of Australia's natural resources. It will protect our river systems and their immediate environment. The plan will also result in the creation of a new industry with a variety of worthwhile employment opportunities that will lead to valuable export opportunities and future economic profit.

Our environmental plan is not in its infancy but has been conceived over a thirty-year period. It is supported by many years of research into Australia's hydrology with consideration given to all its relevant aspects. The planners have taken a holistic and lateral thinking approach which, if implemented, would also improve agricultural production, improve our river systems and reduce the extreme impacts of those destructive flood and drought cycles.

Our plan also has an historical perspective because it observes the valuable lessons learned due to the failure of a particular and very important aspect of irrigation. Unfortunately, it is a method still used in Australia despite the fact that this same method dates back to an ancient civilization. It was a failure then and furthermore this method was applied in a country with a climate very similar to our own.

Ancient Mesopotamia once had an open channel irrigation system dating back thousands of years, devised by engineers to supply water from the mountain snowmelt to the crops on the plains. As in Australia, the climate alternated between flood and drought. The silt built up in the channels, as drainage was poor and the country flat. Salinity became a persistent problem with the farmers downstream complaining about being on the receiving end of saline water. Over time, evaporation, soak and salinity led to the loss of many crops. Much of these croplands became the deserts of the modern Iraq that we know today, deserts that have existed for the last 600 years. There is much that we can learn from history.

It is important to note that while on the surface, an engineered solution on its own may not necessarily encompass all the requirements, our plan goes much further as it combines both an environmental and scientific study of our vast continent over many years with the first principles in engineering. This means that the end result is not just a guess. It has been conceived using a scientific approach with the benefit of proven engineering skills so that the plan is practical. It has been calculated both in terms of cost and application.

We have produced this easy to read version that describes the plan in simple point form. This is not a technical document like the 'Fast Track Submission' that we forwarded to the Federal and State Governments, using their set of requirements for a water presentation.

Our aim is to produce an easy to understand outline of a plan that embraces modern technology and proven principles of engineering and science. It is ruled by environmental guidelines to produce a positive and sustainable future for Australia.

INDEX

The presentation of the plan is broken up into the following segments:

CONTROLLING THE WATER. A PRACTICAL MEANS TO AN END

Waste Stream Treatment is Important (Page 24 - 25)

- Proposed waste facility, Dubbo City, used as explanation
- Treatment of sewage
- Treatment of garbage and industrial waste
- Treatment of green garbage waste
- Construction of one-stop treatment plants
- No more polluting buried waste

Plantations (Page 26)

- The make up of plantations
- Use of plantations
- Growing methods
- Profitability and financing of plantations

Government's Role in the Plan (page 27)

- Government support essential from the three levels of government
- Supporting fast track legislation
- Arranging the financing of the water plan

Economic Overview of the Plan (page 28)

- The economic benefits of the plan
- The estimated cost

CONTROLLING THE WATER
A PRACTICAL MEANS TO AN END

One of the most vital components in the Water for Australia Environmental Plan is the Water grid. It replaces the current and wasteful open channel irrigation method that also continues to contribute to salination.

THE WATER GRID

Explanation of Water Grid design
A water grid is a network of pipes laid in a configuration of one square kilometre in low to flat profile country. In more undulating areas the pipes are laid to suit the topography, maintaining a one square kilometre catchment of varying shapes.

Australia is a low profile continent, with long distances between scattered rainfall patterns, which can produce simultaneously, flood in one area and drought in another. The pressured pipe mains that make up the grid, transport water from where there is a surplus to where it is needed.

Precipitation is now being lost, due to evaporation and soak from very large catchments. The grid was designed to overcome this problem, by breaking up these large catchments into one square kilometre catchments. The run-off is collected in ten megalitre, covered reservoirs, called water flow collectors, one to each of these small catchments. This allows for most of the water to be collected and stored before the cloud cover that produced the rain, disperses.

The grid pipes are to be manufactured from PVC or other recycled, low temperature plastics.
Polyvinyl chloride has been selected because it can now be produced in modern safe conditions and uses the salt, provided by the desalination process.

Benefits of 300mm bore water pipe transfer are as follows:

- Easy to lay in shallow trenches
- Long life as the plastic is not exposed to ultra violet bombardment
- The pipe is light to handle and its smooth bore cuts down on friction loss
- PVC pipe accepts land undulation and movement better than most materials
- Plastic pipes are easy to maintain

How the Water Grid works
The grid of pipes, laid over a selected area, allows for a constant water supply to that area. This supply of water would be at a constant pressure of 276 Kpa (or 40lbs. per sq. inch). The pressure is maintained at each covered water flow collector by solar powered pumps.50 Sq. meters of photovoltaic panels and two small wind turbines are installed on the roof of each water flow collector, to provide sufficient power.

Water can be transferred at a rate of 11,120,000 litres through each 300 mm pipe main at a velocity of 320 kilometres every 24 hours. 1,500 conduits would transfer water at a rate of 16.7 gigalitres on a front of 1,500 kilometres wide for a distance 320 kilometres every 24 hours.

The water supply is maintained by the following back up facilities:

- Existing major infrastructure dams and farm dams
- Large flood storages in converted disused mine sites
- Collection of the run-off from the small catchments, stored in covered water flow collectors
- Desalinated ocean water
- Groundwater resulting from lowering and desalinating the high water tables
- Re-use of free flowing ground water on its way to the ocean
- Artesian water, restricted to the rate of recharge

The pipe main system can be used to transport salinated water from affected farms to one of the salt product plants, where the minerals are extracted and the desalinated water is returned to the grid for use.

The grid operator, from a central control using solenoid valves, directs water through any predetermined route along the grid.

This transfer of water across areas of this flat continent is essential for the success of any water management scheme.

The benefits of a Water Grid

Water grids provide for the use of modern technology to replace ancient, water wasting, open channel irrigation methods that have caused salination and desertification.

A water grid would:

- Eliminate evaporation, salination and wasteful soak and saves up to 86% water!
- Deliver water anywhere within the grid area
- Reduce flood damage e.g. by the use of storage and rapid distribution of excess water
- Reduce the effects of drought by the use of the additional water storage facilities and effective distribution
- Prevents the depletion of rivers by decreasing the irrigation water demands on river flows, by replacing open channels with pipes
- Provide permanent water supply for crops, grazing, tree plantations, parks.
- Provide a substantial increase in farm income exports and benefits the economy.
- Create employment on farms and country towns, now in severe decline
- Reduces loss of topsoil by wind and water scour due to increased soil moisture and growth

HARVESTING THE WATER

Water grids provide the best method for harvesting water. The small catchments and covered storages allow for a high capture rate, as the loss from soak and evaporation is greatly reduced.

Storage
Water storage is very important to the grid system. It plays a vital role in reducing the damage inflicted by the extremes of flood and drought. It is most important that Australians wake up to the potential benefits by using open cut mine sites as major water storages. The Water for Australia plan has covered all the aspects in the use of these worked out, open cut mine sites. Mining companies should be required to enter into a predetermined hydraulic plan, before the mining permit is granted.

The conversion of mines now operating would provide a storage capacity in excess of thirteen thousand gigalitres. This would provide huge storage back up, and we would gain beautiful lakes, full of fish, surrounded by parks, for recreation, tourism, and aquaculture—instead of a pockmarked landscape.

The following water storage facilities would be developed during the plan's construction:

- There would be in excess of 1,260,000 water flow collectors, holding 10 megalitres each, as planned for the Eastern grids, in Queensland, NSW and Victoria. This would produce a storage capacity of 1,260 gigalitres.
- The storage of the Great Artesian Basin could supply 109 gigalitres taking recharge at 300 megalitres daily. WFA believes the recharge rate is higher than this figure.
- Free ground water in aquifers, heading for the ocean above the impervious layers can be used, and reused on its journey to the ocean.
- The ocean used as a back up, is rated to the capacity of desalination and distribution through the water grid.
- All of the major dams and farm dams now in use for the rural and mining industries.
- Stored water resulting from lowering and desalinating water tables.

Distribution
The transport and distribution of water by a grid is the only way for Australia to go, as it answers most of the problems that stop this nation from reaching its true potential. The distribution of water is another salient feature of water grids. The designers have selected 300 mm internal diameter plastic pipe, which is the smallest pipe that can perform the function required in the design. This pipe will be buried in a 1-metre trench. This depth will prevent damage by bush fire, farm machinery and protect the pipe from ultra violet bombardment. Exposed plumbing will be manufactured from metal. The trenching will blend in with the landscape and will not be visible after two years.

Application methods to save water
Australia using open channel irrigation and midday monsoon spraying is the equivalent of farmers using bullock wagons to haul away their crops. If we want to save the upper soil layers and continue farming on a sustainable basis, then we don't want to flood the flat land and turn it into a salinated swamp. By applying only sufficient water by drip or sub soil irrigation to maintain a suitable crop transpiration and soil moisture level, salinity can be controlled and successful crops produced.

Ways to save water
We will not try to explain the many ways to conserve water put out by the authorities for our urban areas, but concentrate on the rural sectors.
Saving water by re-use is a sensible way, wherever possible. Drain your growing areas into wells or ponds using depressions for collection. Growing suitable water plants in the ponds will improve the health of the water. Use shaded troughs for animal drinking facilities in preference to earth dams, which cause contamination by drought weakened stock, following receding water in dry times, getting bogged, dying and spreading disease. Watering crops as explained in 'water application'.

Ways to gain extra water supply
The Water for Australia plan designers realize that extra water would be required to drought proof large sections of Australia by the use of water grids.

These increases would be achieved as follows:

- The saving of water as a result of using pipes and covered collectors, dramatically reducing wastage by evaporation and soak
- The adoption of drip and sub soil irrigation
- Extra water gained from lowering the water tables by dewatering bores, and the desalination of that water
- Recycling of free ground water from soak, now lost, from inland rainstorms. This water can be used many times during its journey to the ocean, the only loss being by plant transpiration and evaporation
- Increased storage of excessive flood flows throughout the grid system
- Capping of all artesian bores, except those coupled to the grid system
- The collection and storage of some excess river flows in wet season conditions

These savings can easily be achieved by the use of the water grid concept.

Note on the extraction and use of groundwater
The use of groundwater is imperative to Australia's needs, however we must not overdo the extraction. We must learn from the lessons of Mexico City, Libya and other parts of the world where land subsidence has occurred when the hydraulic support was removed, and not extract water from any of our artesian basins faster than the rate of recharge.

However the free flowing water in aquifers can be reused many times on its journey to the ocean.

FLOODS

Prevention of infrastructure damage
Water grids are a vital tool in the reduction of flood and infrastructure damage. The grid operation quickly picks up and collects excessive run off before it accumulates into a flood that rips out topsoil, carves out deep scours and flattens fences by floating debris. Floods destroy man made structures such as bridges, buildings, roads etc. The people clean up the aftermath and pick up the bills for this damage, much of which could be avoided, and extra water stored for future use, if the water grid plan was implemented.

Protection of topsoil preventing flood damage and scouring
Water flow collectors, if correctly placed in the flood path, will pick up water flowing in scour grades before the volume increases into a rip roaring flood with velocity to tear out topsoil and upper strata, deepening the scours. In those situations, the runoff is calculated and sufficient water flow collectors are installed, along with silt arresters, which are cleared after the flood event, and the scoured material returned from where it came. The distance within the water grid would not be further than one kilometre.
In the grid areas, the certainty of water supply allows the farmer to establish and rotate crops, providing protection to the topsoil.

Adjusting flood corridors assisting sustainable reproduction
Scientists have promoted the need for floods as part of the cycle for regeneration that sustains the food chain. Floods will occur as usual from the large catchments outside the water grid areas.
Some diversion work will be required to adjust river flows into areas suitable for flooding, such as wetlands or flood plains.

Prevention of needless loss of life
In the grid areas, the small catchments will reduce the amount of floodwaters in the paddocks giving stock and other animals a better chance of survival.

DROUGHT

The increasing severity of the drought cycle in Australia has been devastating for our farmers and their stock, the environment and the native flora and fauna. A large part of the continent is now in the grip of one of the most extensive droughts on record.

Prevention of loss of flora and fauna
The water grid supply can be used to pipe water into billabongs and wetlands in National Parks in times of drought to help native birds and animals survive. These watering places can also be used to supply fire fighting units, should the government decide to prevent some of the terrible devastation to flora and fauna that has occurred from the worst bushfires on record.

Saving farm animals and crops
Saving farm animals from drought presents little problem for the grid areas. They would scarcely feel the drought, but animals outside the grid areas would continue to suffer the crippling effects of drought. However the design of the water flow collectors allows for a two hectare irrigated paddock surrounding the water flow collector. This provides fodder trees and perennial grasses, for agistment during dry spells. These areas plus the production of lucerne and other fodder produced within the grid areas would certainly reduce stock loss.
The drought would have little impact on crops within the grid area, apart from loss of the nitrogen that precipitation provides. Some types of crops within the grid could be enhanced by drought as the applied water keeps the plant healthy and the extra sunshine accelerates growth. Little can be done for the crops grown outside the rural grid areas.

Greatly reducing economic loss for Australians in the grid areas
The drought effect on farmers has been severe, some of whom are now stretched to their limits by bank overdraughts and extra financial demands, and are being pressured to introduce better environmental practices into their farming operations.

Some of the extra burdens now placed on the farmers include:

- High fluctuations in unstable world markets
- Higher water costs
- Less water available
- Higher fuel costs and more looming
- Lack of suitable labour in rural areas as people leave for coastal cities
- Effects of GST
- Difficulty in meeting their debt obligations
- Higher transport and feed costs
- Drought impact causing—loss of stock, loss of crops, loss of income

The extra burden of drought (continued)

It is unfair to expect the farmers to take the brunt of these increasing burdens, even with the support of inadequate handouts, however well meant.

Australia's history shows that the rural industry has provided the backbone of our economic development since white settlement. Now it is pay back time for the Government to adopt a water plan and strategies for the future, using modern technology to provide a permanent dependable water supply that will guarantee income from sustainable farming practices. This action will return services and people to the rural communities where secure job opportunities will be available

Alternatives to dust storm damage

Drought and the clearing of trees and vegetation leaves the soil exposed to wind damage, such as dust storms. These storms remove and scatter huge amounts of topsoil across the landscape, including loss to the oceans. Dust storms rob Australia of its soil capital, as well as causing health, environmental and nuisance problems, extending desertification.

This will not happen in water grid areas, where 50% of that area is planted with North/South tree plantation crops. These trees, plus an adequate water supply, stabilize topsoil within the grid area.

SALINITY

There are two main causes of salinity problems.

Wetland salinity
Australia was once an ocean bed. This land rose above the tidal levels exposing it to climatic conditions. The rain leached the soluble mineral loads into the receding water tables. Recently, over zealous, open channel flood irrigation and monsoon spraying raised these water tables to the surface returning the minerals to the upper soil layers, producing a salt marsh.

Dry land salinity
The origin of dryland salinity is the same, - the ocean. In addition, wind carries salt laden spray inland from the ocean, where it falls on the surface and evaporates the moisture. This salt combines with dust particles in winds blowing from West to East, carrying dust with around 53% salt mineral across the landscape, picking up additional salt laden dust on its journey, dropping its loads where trees and shrubs dissipate the velocity of the wind. This helps to explain why salt is found in dry timbered areas.

How we can overcome the salinity problem

Rectifying wetland salinity
Engineers built the Snowy River Scheme to supply water to an area that First World War Diggers walked off, unable to make a living, mainly due to the lack of dependable water. The engineers completed their excellent work leaving a national asset producing green hydroelectric power, lakes providing areas for leisure activities and tourism and sufficient water to turn marginal land into our biggest food producing area.

Unfortunately, engineers did not design water distribution to the crops. The application of the water is the nub of the problem causing wetland salinity. Engineering solutions can resolve this problem by the introduction of a water grid and lowering water tables to the required depth, by using de-watering bores. The water is then desalinated and returned to the grid for use. The most modern technologies for controlling water application should be used, such as drip and sub soil irrigation. One of the benefits of the establishment of tree plantations is to maintain lowered water tables.

Rectifying dryland salinity
A suitably sized lined dam should be provided at the lowest point of the area to be treated for salinity. This dam would collect the area run off and is connected to the grid so that salinated water can be transferred to the desalination plant via the grid, and the salt processed into valuable products. Diversion catch drains will be needed to direct the surface run off and the ground water into the dam. Over time the salinity would reduce in that area.

Turning mineral fossil salts into cash

Western Australia has the most severe dryland salinity problem, 1.8 million hectares now being affected by salt. If nothing is done, it is forecast to expand to 6 million hectares within a decade. The concentrated salts in the ground water and dry salt lakes could provide minerals for use in the domestic market and for export. Potassium, magnesium, zeolite, gypsum and common salt are some of the chemicals available, which can be processed by modern technology.

Water for Australia tackles the salinity problem head on and turns it around into a profitable industry for Australia. The plan is to set up ten salt product and plastic factories in areas where the salinity is endemic. Each factory will produce up to twenty marketable items with a throughput of 400,000 tonnes of salt per annum. The throughput of the ten factories will be 4,000,000 tonnes of salt per annum, producing a cash turnover of $1,600,000,000 per annum on items produced with an estimated profit of $160,000,000.

These calculations were based on 65 tonnes of water producing 1 tonne of fossil salts.

THE ENVIRONMENTAL BENEFITS USING THE WATER GRID

River protection
There is a simple and obvious way to improve our rivers and running creeks, and that is to restore the native vegetation, for example, fifty metres back from the defined riverbanks. These corridors should be protected with fences and linked up with the national parks, wherever possible. One has only to walk along the cool shady track under the tall red river gums, river oaks and wattles along a river reserve to realise what a difference a few trees make.

Fenced riverbank corridors would help clean up our rivers by:

- Preserving the river banks from erosion
- Shading the water, thus reducing blue-green algae invasions
- Improving river flows by a reduction in silting and removal of exotics, e.g. willows
- Cleaning up river flows by filtering out farm chemicals and sewage wastes
- Helping to restore native fish, birds and other wildlife
- Lowering evaporation rates

Sustaining old growth forests
There is another simple answer to the unnecessary destruction of our old growth forests. We must grow plantations. Any primary school child could come up with that one.

Woodchippers like Gunns Ltd. are destroying Tasmania's unique old growth temperate rainforests. There is a danger that corporations gaining from cheap or free access to national forests will treat plantations as undesirable rivals in the wood chip and timber industries. Therefore there is a need for government backing for plantations

Reasons to conserve native old growth forests.

- Global warming is a fact— and these old growth forests play a vital role in slowing the greenhouse effect and preserving life on earth
- Trees transform toxic pollutants such as carbon monoxide into fresh air
- Forests are unique wildlife flora and fauna habitats
- There must be many species of useful medicinal plants, as yet undiscovered
- Forests have a well-known calming effect on the troubled human psyche—they are nature's cathedrals
- Forested areas are essential water catchments
- What a boost to the tourist industry—if we only realised the potential, as much of the rest of the world loses its trees

Saving our Great Barrier Reef
Here is a relevant quote from the Sydney Morning Herald (25/01/02) under the headline:
'POLUTION THREAT FOR REEF' - "A cocktail of pollutants carried to the ocean by floodwaters is threatening inshore areas of The Great Barrier Reef, a report has found. A ten year study by the Marine Park Authority, found pollution levels in flood plumes between Townsville and Cooktown were four times worse than 15 years ago"

Environmental benefits – The Great Barrier Reef (continued)

Deforestation for crops e.g. sugar cane, and other farming activities have allowed toxic chemicals, fertilizers and flood plumes to cause this pollution problem.

Restoring the riverbank protection is important. In addition, a portion of the surplus floodwaters from the headwaters of the Northern Rivers flowing from the mountains to the Reef waters could be diverted for water grid distribution.

Extra water for wetlands

'Wetlands' include swamps, marshes, billabongs, lakes, salt marshes, mangroves, coral reefs, and bodies of water, natural or artificial, under the Ramsar Convention (1971). It was an attempt to halt the worldwide loss of wetlands and to promote "the conservation and wise use of wetlands by national action and international cooperation as a means to achieving sustainable development throughout the world". It is now recognized that the wetlands are the 'kidneys' of the country, and the Australian wetlands of all kinds will benefit by the riverbank protection policy and the restoration of all natural flows as a result of the water grid conservation system.

New developments in green power

The plan provides for the development of green power that will help Australia to become recognized as a contributor to sustaining the environment. Water for Australia has developed, as part of its plan, a five megawatt green power station that operates in conjunction with solar ponds, wind power and solar Shas units

We require finance to further develop this concept, which will help Australia to meet its obligations in the world forum on the reduction of greenhouse gases. The manufacture of these packaged power stations would provide export dollars.

Caring for the wildlife in National Parks

During the recent season (summer 2002-3) as many as 90 terrible bushfires were burning across the country and millions of hectares of bushland was destroyed, including the native birds, animals and other species.

The fenced riverbank protection system, linking national parks, would provide a refuge, giving access to waterways and providing drinking water. Wherever required, water grid pipes could be extended into parks to boost water in wetlands, creeks and rivers, for use in times of emergency such as drought and fire.

THE IMPORTANCE OF WASTE STREAM TREATMENT

Using Dubbo City's one stop facility design to explain the points in this section:
WFA has worked for some years on finding practical answers to Australia's water problems. It was realized that in order to clean up the rivers and ground water, we would have to remedy the source of the pollution, i.e. the dumping of garbage, commercial waste and sewage.

Landfills have been responsible for polluted (including toxic) leachate into ground water and rivers, and sewage has been discharged without adequate treatment into country rivers and the ocean. Landfills also continue to discharge gases, including methane into the surrounding area
The approach we adopted was to identify what commercial use could be derived from these waste streams, and if it could be profitable.

It soon became clear that treating and combining all waste streams in one central area, close to the source of the waste, surrounded by trees and shrubs, to produce a passive, air purifying screen for the waste treatment centre, would be the practical and environmental solution. These waste facilities should be as close as practical to the large towns and cities so they are accessible, and can give optimum service.

Australia is a young country in terms of agricultural and industrial development, and we can set an example by showing the world our successful method of treating waste and using the end products wherever possible. These end products become viable in many ways, as will become obvious to those who read our submission.

The facility produces the following products from the intermixing of the multi-waste stream: - electricity, valuable compost, and the recycle of glass, paper and cardboard, ferrous and non-ferrous metals, plastics, cloth, ceramics, rock and ash, and green waste.

Best of all we return polluted water to world standards for potable water.

The above products are sold to offset the cost of setting up and running the facility. However when the environmental cost of doing nothing is added to the equation, our approach is way ahead. It is no use searching for a better environment if we ignore the obvious.

The technologies used in the WFA proposal are basic, down to earth, and practical. The use of bacterial digestion is the most cost effective and proven way to convert properly prepared waste into organic matter, giving off a gas for power production and heat to be used in other processes.

We use minimal mechanical appliances, as practical, to achieve our production. Hand sorting is used when possible and appropriate, and this gives work in areas of high unemployment.

Our current approach to waste management is one where the industry is trying to get on its feet, with a multiple of practices under trial, trying to meet the criteria laid down by Government authorities and the EPA.

We believe that these proposed multi-stream waste facilities are the modern answer to Australia's waste problems.

Waste Stream Treatment (Continued)

Sewage Treatment

Dubbo's sewage discharge is estimated at 120 litres per person i.e.120 x 40,000 people = 4.8 megalitres. The incoming flow will be thickened mechanically, and then blended with ground up biodegradable garbage components, forming a suitable sludge for anaerobic digestion.

The sludge is then pumped into the cell for a digestion period where the gas production and temperature is monitored until the sludge is ready for the next process.

This is a dewatering process, using dewatering decanters, where the solid parts are mixed with well-ground green waste, at 20% of the mix, by volume.

The material is then put through a biostabiliser, for aerobic treatment, where the heat regulates the process and time needed to suit the end use of the compost.

The effluent from the sewage treatment is discharged into a holding dam, and then processed by reverse osmosis. The brine-off is treated by solar stills producing distilled water, and the final discharge is evaporated to form salt crystals.

The design of the digestion cells is to accommodate the volume of the thickened sewage flow and the mixed biodegradable garbage, without any leachate escaping into the surrounds.

The total inflow of sewage per day is 4,800,000 litres. 60% of the water will be removed during the thickening process, leaving a volume of 1,920,000 litres, or 1920 cubic metres.

Added to this is 25.17 cubic metres of wet grindings of biodegradable garbage.

This gives a total of 1920.17 cubic metres.

The volume of the digestion cell is 2,880 cubic metres. One cell will accommodate 1.5 days of inward flow from sewage and biodegradable garbage.

As the anaerobic process will take approximately 30 days, each cell will receive 96.000 litres per day, representing 1/20th of the daily flow.

Each cell will discharge effluent equivalent to the daily displacement.

WFA has designed the digester cells for a long life with minimal attention. The structure is constructed from specially treated reinforcement, placed in high strength concrete, lined with fiberglass, featured in a past patent application by L.J.Hogan.

When the long life span of the cell, with a quiet, continuous, full digestion, gas producing function; along with the press button filling and cleaning techniques of the cell, are taken into account by the decision makers of future waste disposal, this scheme must be considered worthy of serious consideration. We consider the two hundred year maintenance free structure of the buried anaerobic cells, with our use of waste heat to produce power from the stack, to be unique features in our presentation.

THE IMPORTANCE OF PLANTATIONS
THE KEY TO THE REHABILITATION PROCESS

The make up of plantations
The make up of plantations will vary according to the desired result, or end product. In Australian conditions, mixed plantations of native trees suited to the soil and climate are preferable for timber production, in most instances. The variety of plantations includes exotics, and varies from crops producing various oils, fruits, and nuts, to sawlogs and wood chips.

Use of plantations

- Timber plantations should be increased and used instead of destroying Australia's unique, old growth forests
- Plantations of all kinds can be a cash crop and investment
- Plantations lower greenhouse gas emissions
- Deep-rooted trees e.g. Mallee, lower water tables and keep them down
- Various acacia and eucalypts e.g. sugar gums, will grow in saline soil
- Strip tree plantations on farms are shelterbelts, and prevent destructive dust storms
- Plantations increase transpiration and moisture levels in previously arid regions
- Native plantations provide leaf litter and bark, returning leached nutrients, which enrich and protect the soil

Growing methods
The selection of stock is important and should meet the required specification e.g. trees for sawlogs must produce straight trunks with a high canopy and a good growth rate. Trees grown for timber would require close planting of approximately three metres and every second tree removed at the thinning time between ten and fourteen years.

The thinned trees would be used for wood chip and the remainder grown on to saw logs. The selection of trees for other types of crops would be based on high bred, quality production, and adaptability to climate and soil types for best results.

All tree crops should receive the correct amount of water by drip irrigation to ensure the best results.

Profitability and financing of plantations
Timber will always play an important role as a useful resource. The advantage of timber crops is that they can be harvested over a long period, and in the case of sawlogs, the longer the crop stands, the more valuable it becomes. The best time to sell is when the profit margin suits the grower and his backers.

The financing for the grower can be supplied by established crop-sharing financiers, by special plantation loans from banks, or subsidies from government. Draw down on crop development by the grower should be part of the grid plantation program. Long-term plantation crops not only benefit Australia, but all life forms on this planet.

THE GOVERNMENT'S ROLE IN THE PLAN

Support is essential from the three levels of Government
The three levels of Government will be required to play a leading role in the implementation of the water and environmental plan for this nation. It is now time for action as the Mallee-Wimmera government backed piped water scheme, shows that the use of pipes for water distribution is successful, reducing soak and evaporation, and has opened up the way for the use of water grids. We can now commence the high tech environmental plan that will allow Australia to reach its true potential. The plan will set the example, demonstrating the use of modern technology in balancing the environment with human habitation. With this plan Australia will be able to help meet the demands for food, clothing and housing for the increasing needs of the world population.

Supporting fast track legislation
This would be essential due to the size of the planned undertaking, which may cut across some established acts, and in order to clear the way, some amendments may be required. The Grid's construction would require right of entry to construct. The establishment of easements across private property could require compensation in some cases. In all areas where the grid is constructed, the people involved are to be treated fairly. An annual reduction in the cost of the water supply will be equivalent to the calculated quantity that would be available for use related to the average rainfall over the size of the property.

Arranging the financing of the water grid plan
Government will be required to administer the superannuation funds, which represent the compulsory savings of the Australian people. Most of these savings are in the hands of private fund investors, where over thirty billion dollars a year is sent overseas in risky foreign investment, currently losing money. It would be more beneficial for this money to be channeled into Government bonds for the development of macro infrastructure to ensure Australia's future. There is ample potential capital to construct national water grids in planned stages.

THE ECONOMIC BENEFITS OF OUR PLAN

- Larger tax take
- Large increase in overall rural production
- Sustainable rural production in grid areas
- More water for rural and environmental use
- Increase in exports from the rural industry
- Increase in job opportunities, both in urban and rural Australia
- Rebuilding of rural community infrastructure
- The export of products from the ten salt plants
- Income from tree plantations
- Income from expanded aquaculture industries
- Savings from the impact losses due to floods and droughts

THE ESTIMATED COST

The scope of the plan covers large areas in each state. The estimated cost of the plan, and the estimated income, is set out in the 'Business Plan' included in the 'Fast Track Submission' already sent to Government.
The costs of a water grid will be approximately $1.36 million per square kilometer.
The mining company and government will meet the costs of converting mine sites after adjustments are made for the extra work and costs that would have been met for restoration of the site.

Australia is a big country with big problems, and a big plan is needed to overcome them. The scope of the plan is large, and it's not for the small minded. The benefits over time are huge and sustainable. Its implementation can be in stages, where the need is most urgent, and adjusted to the cash flow.

THE ENVIRONMENTAL PLAN FOR AUSTRALIA PRESENTED BY

WATER FOR AUSTRALIA PTY LTD

Laurie Hogan **Barry Dunn**

Sydney Office
PO Box 2010
Peakhurst DC2210

A.C.N. 069300054

Ph: (02) 9913 8603
Ph: (02) 9534 1194
Fax: (02) 9584 9199

www.wfa.com.au

barry@growmax,com.au