Submission to the

House of Representatives Standing Committee on Science and Innovation

Inquiry into coordination of the science to combat the nation's salinity problem

by the

Chinchilla Shire Council

P.O. Box 42
Chinchilla 4413
Phone 07 46627056

Prepared with the assistance of

Dr Peter Wylie

Horizon Rural Management
42 Pratten Street
Dalby 4405

Phone 07 46624899

Issues relating to the science of salinity

In this submission, the Chinchilla Shire Council, on behalf of the residents of the shire would like to draw attention to a number of matters relating to the terms of reference of the inquiry.

Issues for the inquiry which this submission will address include:

- How is the relevant scientific knowledge being utilized in the development, management and implementation of salinity programs.
- The nature and effectiveness of the linkages between scientists and technologists conducting research into salinity and those implementing salinity interventions on the ground;
- How current research into salinity and information on options to address the problem are being distributed across jurisdictions, agencies, and to all relevant decision makers; and
- The adequacy of scientific and technical support for those on the ground implementing salinity management options

In relation to these issues, the main concern of landholders in the Chinchilla shire is that the research to date and the scientific knowledge being applied to the subject is not adequate to determine the significance of the salinity problem and/or is incorrectly being applied to promote solutions which do not have scientific backing.

A related issue is that the information being distributed on the subject of salinity is not based on science relevant to our area, but on misinformation, which is based on research in other areas of Australia, or based on political or conservation agendas which ignore science.

Farmers are confused on the subject of salinity. They are being told they have a significant problem, where there see no visible evidence of a problem. They are effectively being branded as poor land managers, also without hard evidence.

But more importantly, legislation relating to tree clearing is being imposed on farmers, purportedly because it is essential to stop salinity, when the science does not support this conclusion.

Let us look at some of the publicity on the subject of salinity

Queensland: Alarming new salinity maps
Date 18/7/02
Salinity is often caused by large-scale clearing of trees. In Queensland's portion of the Murray Darling Basin, the evidence is compelling: 60 per cent of productive cropping and pastoral lands in the Queensland Murray Darling Basin are seriously threatened by salt. Salinisation of rivers in Southern Queensland and northern NSW will soon see local drinking water supplies quality exceed World Health Organisation standards Millions of dollars worth of roads, pipes and other built infrastructure are at risk. **The Vegetarian and Vegan Society of Queensland**

Date 24/7/02

CANBERRA - The Australian government flatly rejected a proposal yesterday to buy and close the nation's largest cotton farm in Queensland state to divert water into the stressed Murray Darling basin and fight rising salinity. **The Courier Mail**

Salinity and Land Clearing (2002)

The clearing of our native woodlands and forests can lead directly to salinity problems. Land clearing and excessive irrigation cause these water tables to rise.

These land degradation problems are putting at risk the productive heartland of Queensland's agricultural industry. Already millions hectares of farmland around Australia has been layed waste by the scourge of land degradation and the dryland salinity, costing rural communities millions of dollars each year.

Last year the Commonwealth Government released a disturbing prediction that if present land management practices continue (including clearing of native vegetation) in 50 years 3,100,000 ha of agricultural land in Queensland will be effected by dryland salinity. This would make Queensland equal second with Victoria with the worst dryland salinity problem in the country.

CSIRO has indicated that if we keep clearing we will also be facing a salinity crisis like the southern states.

In the Condamine-Balonne River systems just west of Brisbane The Murray Darling Basin Commission predicts that in the next 40 years water will be too salty to drink or use for agricultural purposes 6 out of 10 days

If we as a community move quickly we may have time to prevent the long-term negative environmental, social and economic effects of salinity. One of the best ways of preventing salinity becoming a problem is keeping as much deep rooted perennial vegetation (trees and shrubs) in the ground. Stopping unregulated clearing of native bush in agricultural areas is the key.

Website of the Queensland Conservation Council

Why are we concerned about the science of salinity?

The reasons for concern about the interpretation of the salinity problems in Queensland is that most of the information in the media, from conservation groups, CSIRO and the Queensland government, as indicated in the above quotes from media releases, is wrong or cannot be fully supported by scientific research.

Based on wrong information, draconian solutions to a relatively minor problem are being foisted onto farmers, affecting their livelihood. Farmers are unfairly being given a bad report card with respect to their environmental management.

There is reason to believe that the salinity problem across Australia has been exaggerated by organizations and institutions which stand to gain from more research funds or 'Action Plan' funds from the Commonwealth Government.

The Chinchilla Shire is an example of an area of Queensland, which has been rated as having a high salinity hazard over much of the land, yet does not appear to have any significant areas affected by salinity.

The salinity hazard maps have created confusion among the community and much undue concern within the ranks of environmental groups.

A significant emphasis has been placed on the need to stop all tree clearing in Queensland, based on the faulty premise that this is causing a large salinity problem which is rapidly getting worse.

Some information which is not based on adequate science includes:

1. There is a large salinity problem in Queensland
2. The salinity problem is getting worse
3. River water will become too salty to drink
4. There is a need to stop all tree clearing to halt developing salinity
5. Irrigation in Queensland is contributing to salinity

1. There is a large salinity problem in Queensland

The area of land seriously affected by salinity in Queensland has been estimated by the Department of Natural Resources at 48,000 hectares. This area is only a small fraction of the Queensland landscape, but is difficult to justify even this area on the basis of known outbreaks of salinity.

In the Catchment of the Condamine River, which includes the Chinchilla Shire as part of the broader region of the Darling Downs, there are approximately 35 salinity problem areas which average less than 10 hectares. This means the total amount affected by salinity is less than 400 hectares out of around 1 million hectares of landscape.

Despite the fact, that there are large areas of the Chinchilla Shire mapped by the Department of Natural Resources and Mines in Queensland has having a high salinity hazard, there are no outbreaks of salinity of any consequence in the shire.

Areas of known salinity outbreaks in other areas of southern Queensland are of a similar order of magnitude to the Condamine Catchment, with several hundred hectares of salt affected land in the South Burnet, Lockyer and Fassifern Valleys and Central Queensland. A more conservative view of the total area affected by salinity in Queensland is less than 10,000 hectares.

2. The salinity problem is going to get worse

The salinity hazard maps portray hundreds of thousands of hectares which could possibly become saline, with an estimate (again by the Department of Natural Resources) of 3 million hectares affected in 50 years time.

However, most of the salinity outbreaks have been around for 20 or 30 years and do not appear to be getting any worse.

The salinity outbreaks in the Condamine catchment occur where there are blockages to underground flows in the valleys, such as where basalt meets sandstone or alluvial deposits. In some cases the outbreaks are caused by water tables rising due to man-made blockages, such as roads. Salinity in these areas is caused by evaporation of water from rising water tables over many years.

Salinity may well increase, but the order of magnitude is more likely to be an increase from 400 hectares to 800 hectares rather than a projected increase to 100,000 hectares as suggested by the DNR mapping process.

It is difficult to see why salinity in the Condamine Catchment is going to become much worse. Tree clearing and the development of cultivation for cropping was largely completed 50 years ago. The salinity problems which are evident in the catchment appeared around 30 years ago and do not appear to be expanding in recent years. Water tables in this area respond quickly to wet and dry seasons and there is no science to support the idea of a 'sleeping' problem in this area which will erupt many years in the future.

In fact, rather than get worse, salinity in the Condamine Catchment has *decreased* over the last twenty years. Farmers have successfully turned around some of the more significant outbreaks of salinity, with around 25% of recorded salinity outbreaks now productive and stable. The most successful treatment of salinity has been where the water has been put to good use in irrigation of crops or growing deep rooted crops such as lucerne.

So what is wrong with the salinity hazard maps? Why are they bad science?

One reason is that there is a flaw in the science on which the maps are based. One of the inputs into the hazard maps is the salt content of the subsoil. This is regarded as significant on the basis that if there is a considerable accumulation of salt in subsoil, there is more hazard relating to the mobilization of the salt.

The flaw in the argument is that the soils with the highest concentration of salt in the sub-surface layers are those which have massive or tight subsoils and do not leak. The salt has built up in the subsoil, *because* the soils do not leak. However, it is drainage or leakage which poses a salinity risk. The greater the movement of water through the soil, the more chance there is of it taking salt with it and accumulating in a valley as a rising water table.

Another flaw in the scientific process which produced the maps, is that there are almost no outbreaks of salinity in the areas designated on the hazard maps with a high hazard level, while most of the salinity outbreaks (the 35 mentioned above) occur in areas designated on maps to have a medium or low salinity hazard.

There are no salinity outbreaks of any significance in the Chinchilla shire after 60 years of land clearing and cultivation. If salinity was going to be a huge problem, there would have been more natural salinity outbreaks at the time of first settlement and more response to clearing, where some salinity should start to emerge in a time period of 20 to 30 years after clearing.

This is the experience in Western Australia and Victoria, where salinity problems have been obvious from the time man first arrived to settle the land.

Our landscapes and climate are quite different to Western Australia and Victoria. Here the soils mostly have a high clay content and the rainfall is more intense. The rainfall is also more variable with large surpluses of rain in some years. Most of the surplus water moves off the land, rather than through the land.

Farmers have cultivated soils on brigalow lands (which form a large percentage of cropping land in the Chinchilla Shire), which have naturally high levels of subsoil salt, for fifty years without mobilising salt to form salinity outbreaks. Estimates of deep drainage on cropping land on brigalow soils are in the vicinity of 5 to 10 mm per year, out of the rainfall total of 600mm. This occurs mostly in two or three wet years out of 10, when trees or grass would not much more effective than cropping in reducing drainage.

There is a need to put the salinity problem in perspective, and a need to avoid the wrong conclusions that a massive problem is developing and that irrigation and tree clearing and are the cause of salinity.

3. Riverwater will be too salty to drink

The quality of runoff water in the Condamine-Balonne river system in Queensland (the headwaters of the Murray-Darling) has generally been good with no evidence of an increase in salinity.

With the exceptions of one or two minor springs, which contribute moderately salty water to the river system during dry seasons, there is no evidence of any direct linkage between ground water and river salt, or any likely increase in the contributions of salt to the river systems.

It is noteworthy that a recent examination of the water quality data of the Murray River by Dr Jennifer Marohasy of the Institute of Public Affairs has suggested the water quality has improved in recent years, despite dire predictions attributed to CSIRO, that water quality is declining and the river will soon be unfit to drink.

4. There is a need to stop all tree clearing to halt developing salinity

Tree clearing does not cause salinity in Queensland. Research results from the Department of Natural Resources which have been suppressed from publication, and on which some scientists have been restricted from public comment, indicate no difference in the drainage below pastures and trees across most of the inland landscape of Queensland.

There has always been a small amount of water movement through soils, particularly in the higher rainfall areas and where soils are shallow on fractured basalt or gravel ridges. For the most part this movement of water results in ground water, which is of good quality and is an important resource as stock and drinking water for towns and farms.

Where the salinity outbreaks have occurred in the Condamine Catchment, the underground water causing the rising water table is mostly of suitable quality for drinking and for irrigation.

It is only where the water moves up through soil which has salt in the lower layers or where there is continuing evaporation over a long period of time that salt builds up to a

problem level. This means the logical answer to salinity is not the planting of trees, but to use the excess water in a productive way.

A corollary of this conundrum is that if we could plant enough trees to stop drainage through the soil, then we would stop intake into the groundwater systems which provide drinking water which is the lifeblood of farm families and livestock. It would also impact on runoff and result in less water in the river system, causing a different environmental problem.

This little recognized 'catch 22' is not unique to Queensland. On a salinity excursion as part of a recent conference attended in Western Australia, one of the salinity experts commented that "If we could plant enough trees to stop groundwater flows in this catchment, we would also stop the Swan river."

Even though they are deep-rooted, trees cannot stop drainage in Queensland. Rainfall is quite variable and there are periods of rainfall which are in excess of the ability of trees to use and drainage will occur.

On shallow soils where there is significant intake into the groundwater, perennial grasses are just as effective as trees in reducing drainage. Most of the drainage occurs in wet years, when trees cannot use the surplus rainfall.

5. Irrigation in Queensland is contributing to salinity

Irrigation areas have been monitored and measured but irrigation has not been shown to cause salinity development in Queensland. There is some concern about rising water tables in the St George irrigation area, but this is still far from being a salinity problem (the groundwater is many metres below the surface) and is being addressed with programs on better irrigation management.

If irrigation farmers can use water more efficiently and reduce drainage, it is a positive result for both production and the environment.

Farmers are not complacent

Despite a lack of evidence for salinity in the Chinchilla Shire, farmers are not complacent about the problem and are actively seeking information.

The main problem, and the reason for this submission, is that the information is lacking and in some cases based on misinterpretation of scientific research or political agendas.

As part of a general thrust to improve their environmental management, farmers are adopting new farming practices and better grazing management which will improve the utilisation of water and result in better crops and pastures.

The effect of this over hundreds of thousands of hectares will have much more impact at a broad scale catchment level on reducing the potential for salinity than the possible planting of a few thousand hectares of trees to increase water use

The answers to catchment scale salinity problems are farming systems and practices which can minimise leakage of water through the profile. The Liverpool plains are an example of this, where long fallow farming systems have contributed to salinity and a move to higher crop frequency will reduce drainage and salinity.

This is quite different to small localised outbreaks of salinity, which make up most of the current salinity outbreaks in the Condamine Catchment. These outbreaks are likely to have local solutions, such as planting lucerne or pumping out groundwater and using it for irrigation of high value crops.

Farmers need better information on salinity, both on the size of the problem and on the solutions. There needs to be more emphasis on productive solutions to salinity, which will make landholders more profitable at the same time as being more sustainable.