SUBMISSION LONG TERM COUNCIL COMMUNITY PLAN

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Signed ..... Don Rowlands .....

I wish to speak to my submission.

Re 5 year Capital Expenditure P83

ESTUARY (IHUTAI) WATER QUALITY ACTION PLAN

This submission is seeking Budget provision for $7 million over 5 years. There is a case for funding a wider long term pollution strategy. Such a strategy needs to be part of a cost/benefit analysis to assess effective interventions to improve water quality. It would be useful to assess other strategies in the context of a cost/benefit analysis of U.V. treatment.

VISION

The measure of a great city is how well it takes care of its environment. The health of its citizens depends on the retention of a safe and unpolluted natural environment.

Instead we have the Estuary and adjacent beaches unsafe for swimming or fishing. Every pathway into Southshore spit contains signs warning people of the health dangers of taking shell fish.

The Council's goal should be to achieve a good grading for water quality in the short term and a "very good grading in the long term. The current situation is a deterrent to tourism and recreational users. Although the Ngai Tahu have put a rapui on the Estuary and no longer collect shellfish many continue to put their health at risk by collecting the shellfish.

The Council Plan needs to set progressive goals of stage one to have a safe swimming environment; stage two to be able to safely eat the fish and stage three to have the shellfish declared safe for human consumption.

FAECAL COLIFORM BACTERIA POLLUTION

The sewage pipeline into Pegasus Bay and the improved treatments at Bromley will reduce faecal coliform bacteria levels.

"Faecal coliform bacteria comes not only from the ponds, but also from stormwater runoff. In the city bacteria and viruses in rubbish, offal, and faeces from birds, dogs, rats and other animals all wash into the river and drains. After a period of dry weather the "first flush" of rain contains a lot of bacteria, but the high numbers decline within a day or so.

Bacteria counts rise after rain – possible washing in from bird droppings on surrounding land. Gulls for example, especially those which feed on rubbish tips, are known to excrete large numbers of bacteria such as *E. coli* and *Salmonella*. Scientists do not know what proportion of the faecal coliform bacteria entering the estuary comes from the birds in the estuary and ponds.

Some bacteria die from contact with salt water, from being exposed to ultraviolet light, or are killed by other organisms. But when sediment particles settle to the bottom they carry with them any bacteria attached to them. Bacteria survive better in the sediment than in the water column, and the sediments therefore become a reservoir of microbes. Human disturbance, wind, tides and currents remix the sediments and bacteria back into the water. Cockles and other estuarine animals are able to either kill or excrete many of the bacteria which they ingest. Viruses are far more rapidly absorbed into the sediments, survive better in the estuarine environment, and tend to remain longer in shellfish than do bacteria."

Source: The Estuary (ed) S.J. Owen. Parks Unit CCC 1992.

Shellfish gathering: Shellfish are used as an indicator of water quality because they are filter feeders and accumulate bacteria in their bodies, which if eaten could cause illness. The Ministry of Health's guidelines for acceptable water quality for shellfish gathering is 14 faecal coliforms per 100ml. Currently these standards are being exceeded in most parts of the Estuary. As mentioned earlier however, it is important to remember that even if the effluent discharge from the Treatment Plant were removed, water quality standards for the consumption of shellfish would more than likely still be exceeded as a result of pollutants reaching the Estuary from other sources. (CCC, Issues and Options Report: 3-9). This has had implications for local Tangata Whenua who traditionally used the Estuary as a *mahinga* kai site.

Local Ngai Tahu have put a *rahui* on the Estuary and no longer collect shellfish there despite its historical importance as a *mahinga* kai. The Health Board similarly recommends that people should not eat raw shellfish from the Estuary, especially close to areas with higher concentrations of dangerous pollution including the oxidation ponds and the river mouths.

Recreational Activity: Microbiological organisms including bacteria, viruses and protozoa can be present in our waterways and waterbodies and could pose a health hazard for those using the water for high contact recreation such as swimming. The Ministry of Health has recently revised its guidelines for monitoring water quality suitable for contact recreation. Now, Enterococci rather than faecal coliforms are being used as the species indicator of poor water quality in marine waters. E. Coli remains the key indicator in freshwater systems like the Avon and Healthcote Rivers.

Source: Avon-Heathcote Estuary Issues Report, CCC, Aug 2000

HEAVY METALS

The growth of Christchurch has also caused a rise in the concentrations of heavy metals in the estuary muds. Zinc is the most enriched heavy metal in the estuary, followed by lead,

chromium, nickel and copper. In small amounts heavy metals are necessary for life. For example zinc is an essential element in many enzymes, and copper is the basis of haemocyanin, the blood pigment in shellfish. In large doses however, they can be harmful.

One way to judge the levels of heavy metals is to compare them to those of a more isolated wetland, such as the Ashley-Saltwater Creek Estuary, at the mouth of the Ashley River. Compared to the Ashley Estuary the Avon-Heathcote Estuary contains over twice the average concentrations of copper, chromium and zinc and almost three times the average lead levels. However the heavy metal concentrations in the sediments of the Avon-Heathcote are nowhere near as high as in heavily industrialized areas of New Zealand.

Within the estuary, concentrations of these heavy metals vary considerably. The silty mudflats in the Heathcote Basin, along the western margin and around the Avon River mouth, have the highest concentrations. A 1988 study showed that on average, they contain twice the chromium and zinc, three to four times the copper, and four times the lead levels of the less silty south-eastern half of the estuary.

Effluent from the oxidation ponds is the main source of heavy metals entering the estuary. Stormwater runoff is another important source. Rain washes zinc from galvanized roofs and house paint, and lead from exhaust fumes, into the drains and on out to the rivers (in parts of Riccarton Road 100 grams of street dust would contain over a gram of lead). The amount of heavy metals in water entering the estuary rises in winter, reflecting increased use of coal and petrol, and drops off in summer. An unknown proportion of the heavy metals is flushed out of the estuary by the tides.

Heavy metals rapidly attach to particles of sediment, particularly fine silt and clay. Concentrations of heavy metals in sediment either suspended in the water, or in the mudflats, can be thousands of times greater than concentrations of heavy metals dissolved in the water itself. Heavy metals in the top ten centimeters or so of the mudflats are recirculated by burrowing animals such as shellfish and polychaete worms. Animals which eat the sediments directly, such as mudflat snails, contain higher levels of heavy metals than filter feeders such as cockles. Mudflat snails also concentrate the heavy metals. Copper concentrations in their bodies vary considerably but can be 5-80 times greater than in the surrounding sediments, nickel can be up to 21 times higher, chromium up to ten times higher, and zinc and lead up to twice the sediment levels.

On average, cockles in the Avon-Heathcote Estuary contain significantly more zinc, copper and lead, and mudflat snails contain much more chromium, nickel and lead than those in the Ashley Estuary. However recent samples of cockles showed that none exceeded New Zealand health standards for heavy metals, and when mudflat snails were last tested (in 1982) only the lead levels in some snails from the Humphreys Drive area exceeded New Zealand standards.

Source: The Estuary, Ed. S. J. Owen, CCC Parks Unit 1992

CONTAMINATION BY ANIMALS

In recent years concern has increased about the impact which animal excrement has on the water quality of the Estuary. Large bird populations inhabiting the rivers, their margins and the greater Estuary area (including oxidation ponds), are believed to contribute to the degradation of the Estuary's waters. Gulls for example are known to excrete high quantities of bacteria including E. Coli and Salmonella although scientists have not been able to

determine the actual extent of the problem and its precise contribution to water quality in the Estuary.

It is believed that the problem is particularly significant when rainfall follows very dry weather spells when the animal excrement from birds and domestic animals (particularly dogs) is flushed off the land and into the rivers containing high levels of bacteria. Such an occurrence is difficult to monitor and indeed difficult to manage. The large bird populations inhabiting the Estuary are:

a) Runoff from adjacent land

Water quality can be affected by runoff from adjacent land. Much of the land surrounding the Estuary is now owned by the Christchurch City Council which means that the future of the Estuary is very much dependent on how the Council manages/uses this land. A major portion of this land contains the Bromley farm – otherwise known as the Linwood paddocks. These have been used for the disposal of treated sludge from the sewage treatment works. A portion of this land also includes the Old Bexley Landfill. Runoff from this land has been documented to contribute to a minor (although not insignificant) degradation of the receiving estuarine environment. The assessment of environmental effects for Bromley Farm states that during periods of heavy rainfall, there is a potential for runoff from the farm to transport biosolids and associated heavy metals into the open drains which cross the site. This problem can be accentuated by accelerated erosion in extreme storm events.

b) Rivers

The coastal marine area does not exist in isolation from the rest of the land/water system. Adverse effects on the estuarine coastal ecosystem result from many non-point sources upstream and inland. Both the Avon and Heathcote Rivers drain their respective catchments and along their journey to the sea receive pollutant inputs from:

- Land runoff – especially significant in times of heavy rainfall and during the earthworks phase of construction and subdivision development.
- Stormwater drains discharging into the river systems.

The large Linwood drain also discharges stormwater containing high levels of nutrients, heavy metals and other pollutants from the inland Christchurch urban area (from roads, carparks, houses etc) into the Estuary.

Source: Avon-Heathcote Estuary Issues Report, ecc. August 2000

DRAFT IHUTAI MANAGEMENT PLAN

I support the Ihutai Management Plan and urge the Council in partnership with Environment Canterbury to action and fund the management plan.

Key actions specifically relating to water quality in the Estuary include the following:

Target: Water quality in the Estuary and its rivers is consistent with the maintenance of health aquatic ecosystems.

Actions:

- Compile and distribute document in simple language on current water quality in the Estuary.
- Monitor water quality in sites around the Estuary.

- Identify issues of importance to evaluate impact of removal of discharge and pipeline construction on the biota of the Estuary.
- Determine the level of water quality in the Estuary and rivers that is desirable to achieve: Stage 1, water safe for swimming; Stage 2, fish safe to eat; Stage 3, shellfish safe to eat.
- Identify barriers and methods to achieving those levels of water quality.

Target: Waste and contaminants entering the Estuary are continuously reduced.
Actions:
- Identify locations within the catchment, focusing on a) areas closest to the Estuary where hazardous and/or ecologically damaging wastes have been stored or disposed and b) types of contaminants likely to pose the most risk to the estuarine ecosystem.
- Develop and implement management strategies to prevent migration of hazardous substances and wastes into the Estuary.
- Assist in the implementation of those strategies identified.

Target: Water quality in the Estuary is improved so that conditions are safe for swimming.
Actions:
- Publish gradings given to beaches around the Estuary.
- Determine relationship between stormwater discharges, river water and Estuary water quality.
- Enforce current stormwater discharge consents and advocate for improvements to current stormwater treatments.
- Publish sewage overflow site, duration and frequency of sewage overflows and target these for action.

OVERSEAS EXPERIENCE

I include two overseas examples of strategies and best practice to counter the pollution of river, estuary or beach environments. Attached is background information on two comprehensive programmes, targeting the Swan River in Perth and beaches in Sydney.

The Heavy emphasis in the strategies is on education of the community and business groups regarding the sources of pollution and on simple ways that everyone can make a difference.

I urge the Council to give further consideration to some of these overseas initiatives, particularly the community-based programmes.

I note in particular that the Sydney Councils are spending $1.5 billion dollars on storm water management to reduce pollution in their harbour. Works include detention basins; grass swales, pollution traps and litter booms in addition to education strategies.