Nature Conservation Council of NSW

The voice for the environment since 1955

Level 5, 362 Kent Street, Sydney NSW 2000
Ph: 02 9279 2466 **Fax:** 02 9279 2499
Email: ncc@nccnsw.org.au
Web: www.nccnsw.org.au
ABN: 96 716 360 601

Kurnell Desalination Submissions
Major Development Assessment
Department of Planning
GPO Box 39
SYDNEY NSW 2001

3 February 2006

Dear Sir/Madam,

Re: Ref. number 05_0082 - Submission on the proposed Desalination plant for Sydney

NCC appreciates the opportunity to make a submission on the Environmental Assessment for the Desalination Plant. As the States peak environmental organisation, we are concerned about the proposal and the steps that the government is taking to ensure this plant goes ahead. We are particularly concerned with the lack of attention the government has paid to community consultation on this matter, the failure to consider alternative options and the destructive environmental impacts of the plant not only in the immediate vicinity, but on a much broader scale.

In summary we are strongly opposed to the proposed desalination plant for the following reasons:

1. The environmental assessment process is inadequate. The government is fast tracking the project without adequate environmental studies or tests. The environmental assessment (EA) currently on exhibition is based on a project concept only, not on a detailed design and it is not clear how environmental impacts will be mitigated.
2. The community has not been consulted about the need for the plant. The only opportunity given to the public to comment has been in response to the environmental assessment.
3. Alternatives to desalination have not been properly assessed or publicly discussed by the State Government or Sydney Water. $1.3 billion could be better spent on more sustainable alternatives, including water recycling projects, structural water saving programs, pricing incentives for households and business, rainwater tanks, stormwater harvesting infrastructure, the fixing of leaks in pipes and water education. All these alternatives need to be considered before approving a desalination plant.
4. Greenhouse gas emissions from the plant could add up to 1.25 million tonnes - the equivalent of 250,000 new cars on Sydney's roads.

5. The plant is likely to have major impacts on threatened plants and animals, including wetland birds, bats and frogs.
6. The plant is likely to have major impacts on marine life. Results of a study of a USA Desalination Plant reported a yearly rate of impingement on 55,000 invertebrates and 78,000 fish. The plant would also discharge salty brine/waste straight into the ocean disturbing the immediate marine environment.

Please find attached to this letter a copy of NCC's full submission in opposition to the desalination plant.

If you wish to discuss this matter any further, please contact Daniela Gambotto, NCC's Urban Sustainability Campaigner on 9279 2466.

Kind Regards,

Cate Faehrmann
Director

1. Community Consultation

The consultation process that has taken place for this project is substantially flawed. The community has not been consulted about the **need** for the desalination plant nor the viable alternatives that exist. Most of the consultation that has occurred has been by way of Sydney water informing the public of their plans as opposed to asking the community what they want.

The only opportunity given to the public to comment so far has been in response to the environmental assessment. Meanwhile the State Government appears to have made up its mind on this issue stating that it is "too important to debate."

As this proposal is being assessed under Part 3A of the *Environmental Planning & Assessment Act*, any concerns raised by the community are not required to be taken into consideration by the Minister for Planning in the assessment process.

There is serious concern relating to the proposed pre-construction consultation, which notes that communities will be consulted to ensure that appropriate measures are put in place to mitigate impacts. NCC considers that mitigation or minimisation of impacts does not always necessarily translate to the most acceptable solutions for certain problems. It would be preferable that specific standards and targets were set that would allow ongoing monitoring and evaluation of potential impacts as the project progresses.

A clear consultation framework must be established as a means of guaranteeing inclusive consultation at all stages of the development process.

2. Lack of detail

A major concern of NCC is the lack of detail within the environmental assessment. The EA states that the precise details of the proposal will not be available "until further investigation and design are undertaken as part of the project procurement strategy." It is therefore not possible to make a comprehensive submission based on an environmental assessment that only tells half the story.

As the EA is relevant to the concept plan only, there are significant shortcomings of the document. There are many references throughout the EA to 'more detailed information' being provided at a later stage. At what stage will this 'detailed information' become available and how can Sydney Water ensure that the community will be consulted appropriately?

Within the information supplied by Sydney Water there are also many statements that imply dependency on other factors in the process. It is therefore impossible to accurately determine the full extent of impacts of the proposal.

For a large-scale piece of infrastructure, one would consider that the relevant detailed data had been provided and the investigation had been conducted and appropriately presented to the community. In summary, the EA document does not provide the basis for a fully informed response from the community.

3. Consideration of alternatives

Whilst the EA provides sufficient detail on the apparent benefits of constructing a desalination plant, there is no information to compare it to the many other solutions that exist to resolve Sydney's water crisis. NCC is concerned that viable alternatives have not been considered in this discussion. Sydney has the second highest rainfall of all cities in Australia and this alone is evidence that a desalination plant should be the last option to resolve our water supply issues.

Below is a brief summary of the alternatives that NCC would advocate instead of the desalination plant:

Water recycling
The technology exists to recycle water to any standard we like and to least the standard that desalinated water would be treated.

Cities all over the world successfully recycle water for all purposes, from industrial use to drinking water. Examples of successful recycling plants can be found in the US, England and Singapore. Goulburn (NSW) and Toowoomba (QLD) are also pursuing large water recycling plants for drinking water.

In the east of Sydney, 450 billion litres of freshwater water is discharged into the ocean each year after we have used the water only once. In Western Sydney, we discharge our treated waste water into the rivers. Downstream, the water re-enters into our drinking water supply system. This treatment process could be upgraded to produce pure, clean water out of waste water. There are also many street level or household level recycling techniques available.

Permanent low level restrictions on outdoor water use and education
Most Sydney-siders now recognise that they live in a dry continent and water is a scarce resource. Residents of Sydney have also gone to great lengths in the last 12 months to reduce their water consumption. Recent figures indicate a saving of up to 6% in the last year.

Yet the government is failing to recognise this massive effort that the community has put in. The government should be rewarding the community for efforts made and support further reductions in usage. The average Sydney household uses 420 litres of water per day. Compare this to the Berlin household, which uses 160 litres of water per day. If a large city like Berlin can do it, why can't Sydney?

An education partnership and rewards program between government and community could save billions of litres of water each year.

Rainwater tanks and water efficient appliances
Only a small percentage of Sydney's households and businesses have rainwater tanks and water saving appliances installed. Currently, Sydney Water is offering rebates on rain water tanks between $150 and $650 depending on the size of the tank and water saving devices that the household installs.

Even if part of the $1.3 billion dedicated to build the desalination plant were spent on enhancing the rebates program, the results would be far reaching in terms of water saving and collection.

In addition to the above, there are many other alternative technologies and infrastructure improvements that the state government could invest in to reduce Sydney's overall water consumption and therefore the need for a desalination plant.

4. Greenhouse gas emissions

Desalination is an energy intensive process and thus will result in a huge increase in greenhouse gas emissions.

The Director General's requirements state that "where greenhouse gas offsets are proposed, appropriate details of each offset option must be included in the EA, including implementation measures for each offset option". While greenhouse offsets are a critical component of the proposed desalination plant, the Environmental Assessment contains little or no detail on the greenhouse offsets associated with this proposal. NCC would therefore argue that the Director Generals requirements on this matter have not been adequately addressed.

On this issue, the EA says that a cost effective portfolio of greenhouse gas mitigation measures will be developed to effectively reduce/offset the greenhouse gas emissions associated with operating the project from grid sourced power (coal fired) by 50%. Over the life span of the project mitigation measures proposed include:

a. purchasing renewable energy and/or lower greenhouse gas emission energy;
b. purchasing offsets mechanisms such as renewable energy certificates, forest sequestration and NSW greenhouse abatement certificates.

In response to the above, how can Sydney Water justify the offsetting of greenhouse gases by purchasing green energy when it is estimated that the amount of power required for a 500ML/day plant is almost triple the amount of green power supply currently available.

Further, gas (as an alternative and lower green house gas emission source of energy), is not currently available from the grid and is therefore not an option in terms of mitigation measures.

Gas-fired generation and renewable energy are again playing only a very minor contribution because 'the cost of gas power is greater' (Page 6.9) and renewable energy 'may prove to be technically and/or commercially unviable' (Page 6.10). Sydney Water explains that when the cost is right and hence the market and availability grows then they may consider renewable energy with other energy supply options (Page 6.10). But how will the market grow and how will gas and renewable power become a more feasible option to use if major infrastructure projects like this are not forced to switch to them and hence allow their expansion for the future?

The EA further notes, "Sydney Water is committed to investing in greenhouse gas reduction strategies for the desalination plant to effectively reduce greenhouse gas emissions by 50 per cent". This is a commitment, but it contains no detail of the mitigating measures as required in the Director General's requirements.

As an additional factor, no mention is made of the increase in vehicular movements this development will generate and the greenhouse emissions associated with those movements.

The lack of detail relating to green house gas offsetting is contrary to the requirements of the Director General. Additionally, the high energy demands of the proposed desalination plant and the associated greenhouse gas emissions, exceed trigger values, and have national and international consequences. It is therefore considered that this proposal be referred to the Department of Environment and Heritage for further consideration and assessment.

5. Site impacts

There are potentially significant impacts on many threatened animal and plant species existing on the site, including the Green & Golden Bell Frog, the Wallum Froglet, and Grey Headed Flying Fox, plus four endangered ecological communities. The proposed site is also in close proximity to Botany Bay National Park and the RAMSAR listed Towra Point Aquatic Reserve.

Four threatened ecological communities listed under the *Threatened Species Conservation Act 1995* (*TSC Act*) exist in these surroundings, of which several threatened flora and fauna species under the *TSC Act* are dependent on their very survival and well being. Nonetheless, Sydney Water implies that past surveys have considered it unlikely that these threatened populations still exist in any significant numbers. There is no consideration to possibly carry out longer term monitoring that is also seasonal to properly assess the level of possible disruption and change that could occur.

Sydney Water is also dismissing the likelihood of these species being 'impacted' upon by the proposal - 'impact' being defined as vegetation clearance, hydrological changes, runoff and sedimentation, isolation and light and noise. The EA considers these to be of minor significance and not enough to cause any major impact in this high conservation area. NCC is of an opposing opinion on this matter and considers that all the abovementioned 'impacts' are likely to be detrimental to the survival of these species and communities.

There is also a strong cultural heritage association with this land. Evidence suggests that indigenous people have used the peninsula for at least the last 5,000 years. Sydney Water has justified the proposed development of the land by stating that it 'has been modified by previous activities that have resulted in the majority of the land surface being disturbed' (Page 5.2). NCC considers this insufficient justification for the destruction of a site of national heritage significance.

Sydney Water claims that these places of ecological and indigenous significance are 'limited to conservation areas' (Page 5.2). However, habitat for threatened fauna species would certainly still make use of land outside the conservation area (i.e. migration, searching for food etc.). Directional drilling/boring and layering of pipework and tunnels in the land would surely impact the natural hydrological regime that the identified groundwater dependent ecosystems (GDEs) and associated flora and fauna populations and communities rely on.

The 'conservation area' identified in the EA equates to approximately 34 per cent of the total land Sydney Water wishes to use for their desalination development. However there is no guarantee that this part of the land will be adequately maintained in its present condition. Nor is there any guarantee that the desalination plant will not expand into this land in the future.

The proposal is likely to have impacts on sensitive groundwater dependent ecosystems, including potential for alteration of groundwater levels on site and down gradient areas, and interruption of the saline freshwater interface at Quibray Bay.

The local delivery route from Kurnell to Caringbah 'could pass through and adjacent to features of conservation significance.' Ultimately, this would result in the necessary removal of vegetation some of which has been identified as endangered ecological communities.

As the environmental assessment (EA) is based on a project concept only, not on a detailed design, and it is not clear how environmental impacts will be mitigated, NCC is concerned that the government is fast tracking the project without adequate environmental studies or tests. As the project is deemed 'critical infrastructure' under part 3A of the *EP&A Act, t*he proposal bypasses the *National Parks & Wildlife Act,* the *Fisheries Management Act and* the *Local Government Act.* These legislative mechanisms would normally trigger

the full environmental assessment required for such large projects on sensitive sites.

NCC considers it critical that further investigation of the environmental significance and impacts are detailed prior to any approval being issued.

6. Marine impacts – uptake, output and impacts of related infrastructure on sea grass beds, etc.

The proposed desalination plant is likely to damage our marine environment in a number of ways.

Water Intake

Intake of water directly from the ocean will result in the loss of marine species. Larger animals may get trapped and killed on the intake screens and entrainment occurs when smaller organisms e.g. larvae and eggs slip through the intake screens and are killed during standard plant processes. Results of a recent study of a USA desalination plant reported a yearly rate of impingement on 55,000 invertebrates and 78,000 fish. It is not clear how this threat is mitigated.

NCC urges Sydney Water to supply additional information about the technology used for intake for the desalination scheme, as every existing desalination technology to date does have significant impact on marine life. No scientific papers on the issue have been quoted or used in your report addressing this issue.

Waste/brine outlet

Desalination plants produce liquid wastes that may contain all or some of the following constituents: high salt concentrations, chemicals used during defouling of plant equipment and pre-treatment of water, and toxic metals. The water may also be of higher temperature. The plant will discharge this warm, salty brine/chemical waste straight into the ocean. It is possible that these chemicals will be concentrated where the ocean current takes them and that they will harm marine life. The chemicals released from the plant also have the potential to bioaccumulate, or build up, in local fish populations and impact on larger animals that eat these fish.

The pollution from disposal practices is not properly assessed. There is not sufficient information provided in the EA to conclude that the discharge will not have adverse impacts on the marine environment. Clearly additional scientific research is required.

NCC urges Sydney water to undertake appropriate and detailed environmental assessments of all potential impacts of seawater intake and brine disposal that the proposed development would have on marine life.

Whales

There is an acknowledgement by Sydney Water of the potential impact of site works (particularly noise) on whale migratory pathways (page 19). It is noted that there is potential for fewer whales to be sighted off Cape Solander as a result of the works. Again, there is no indication of the scale of this impact, and it is therefore difficult to provide adequate comment.

Seagrass beds

Seagrass beds are valuable as nursery, feeding and shelter areas for many fish, molluscs and crustaceans, including juvenile sand whiting, blue swimmer crabs and weedy seadragons. The proposed pipeline in Botany Bay would see seagrass beds cleared.

The EA clearly indicates the negative impacts of the clearing of sea grass beds in Botany Bay:

> *'Construction of a pipeline across Botany Bay will involve dredging which could disturb the seagrasses and the bed of Botany Bay' (Page 8.9).*
>
> *'Other impacts could include increased turbidity and the effect on aquatic ecology…spreading of aquatic weeds such as Caulerpa taxifolia' (Page 8.9).*

The invasive green alga, Caulerpa taxifolia, may be disturbed by the installation of the pipeline and this

> *'...could enhance the spread of this pest species' and potentially wipe out large areas of adjacent seagrass habitat' (A3, Page ix).*

The EA tries to reassure the reader that …

> *'A program of seagrass restoration will be established to compensate for the loss of seagrasses during the construction phase' (Page xvii, Summary).*

But it is well known that seagrass restoration is complex and difficult and will take a long while to restore and re-establish. This in turn will affect commercial fishing as marine life will likely migrate elsewhere and may not return and re-colonise the area. A review of information on seagrasses at Silver Beach found that to the 'east of Groyne 7, the seagrasses have become fragmented' with 'bare sand, *Halophila ovalis* and *Zostera capricornii*….this fragmented habitat is where the desalination pipeline will go' (Page 8.10).

Studies have also taken place in Botany Bay near Sydney airport, where seagrass, *Zostera capricornii*, was removed and did not recolonise and hence trends in abundance of juvenile fish in seagrass beds along an estuarine gradient had been greatly affected (Upston & Booth 2003). 'Despite its (*Zostera*) ability to colonise bare areas of sediment, transplantation, especially on a large scale, has proved problematic so far….with very limited success' of

Zostera transplantation around the Mascot runway and Lady Robinsons Beach (A3, Page 44).

The 'northern foreshore of Botany Bay is an area with a history of high recruitment of several commercially important fish species' (Bell & Westoby 1986). The location of seagrass beds in an estuary can also be important towards the settlement and recruitment of fish (Jenkins et al. 1998). Various other studies have found the size of natural seagrass beds to be important in terms to the number of species of fish and macro-invertebrates present (McNeill & Fairweather 1993). Furthermore, there are many factors after settlement that could alter recruit abundances, such as suitability of habitat and species interactions (Risk 1997).

This research indicates the sensitivity of the sea grass beds and the potential environmental and financial loss that may occur as a result of their disturbance.

Contaminated and Acid Sulfate soils

Acid sulphate soil is expected to be exposed within the Caringbah area and 'the route from the desalination plant to Silver Beach' (Page 9.2). Page 9.4 unveils that apart from 'occasional mixed construction waste', asbestos waste is also expected to be found on the site during excavation activities. High concentrations of hydrocarbon contamination is also to be found, the extents of these contaminations are all unknown. There is potential that contaminants could have migrated onto the site from adjacent heavy industrial premises' (Page 9.4). Perhaps a contamination assessment and hazardous materials survey of these neighbouring heavy industrial premises should be performed to get a clearer idea of the level of contamination in the area.

The EA states that 'Sediment in the dredged hole adjacent to the runways in Botany Bay is known to be contaminated' (Page 9.5). Once dredging of the Bay commences many fish could potentially bio-accumulate disturbed contaminates on the bed of Botany Bay and hence come through the food chain via local fisheries.

Migratory Species

Attention must also be made to the close proximity of Towra Point Aquatic Reserve (over 1 km from the proposed route) and Aquaculture (400 metres off Silver Beach) when assessing potential impacts. 'Towra Point provides important habitat for a number of migratory species…. 31 of the 66 species presently listed in the Japan-Australia Migratory Birds Agreement' (Page 10.9). Page 10.9 insists however, that the 'site of the desalination plant does not provide habitat for these species.' However, the indirect impacts of the desalination plant (i.e. increased noise, light and pollution) will interrupt breeding and roosting tendencies in this reserve.

7. The cost

The cost involved in building the plant ($1.3 billion) does not address the ongoing costs of running the plant. The EA does not provide any detail on this matter.

Desalinated water will therefore be more expensive for consumers than any other water supply system – Sydney Water estimates around $60 per household per annum. The community has had little say in this process and will simply have the additional costs of unwanted infrastructure thrust upon them.

Surely this money could be better spent on alternative options that are less environmentally destructive and more socially acceptable.

Conclusion

In conclusion NCC considers that there is insufficient detail in terms of the exact nature and form of the proposal on which to base an accurate and informed comment. The documentation presented by Sydney Water relies heavily on works yet to be undertaken and defers the consideration of assessment of impacts to a later date. Sydney water relies on statements such as works will avoid these areas, or management strategies will be implemented to avoid/minimise these impacts. We are concerned that where such assessment considerations are deferred suitable sites and management strategies to avoid impacts may no longer be available.

NCC also considers that in several areas, the threshold required to trigger an approval from the Department of Environment and Heritage has been reached. In particular the high energy demands of the proposed desalination plant and the associated greenhouse gas emissions, exceed trigger values, and have national and international consequences.

Once again, we would like to strongly express our opposition to this proposal and demand a more comprehensive approach to resolving Sydney's water crisis that would include many of the alternatives suggested in this submission. An essential component to this is the engagement and support of the Sydney community.

References

Bell, J.D. & M. Westoby. 1986. Variation in seagrass height and density over a wide spatial scale: Effects on fish and decapods. *J. Exp. Mar. Biol. Ecol.* **104**: 275-295.

McNeil, S.E. & P.G. Fairweather. 1993. Single large or several small marine reserves? An experimental approach with seagrass fauna. *J. Biogeog.* **20**: 429-440.

Risk, A. 1997. Effects of habitat on the settlement and post-settlement success of ocean surgeonfish *Acanthurus bahianus*. *Mar. Ecol. Prog. Ser.* **161**: 51-59.

Jenkins, G.P. & M.J. Wheatley. 1998. The influence of habitat structure on near shore fish assemblages in a southern Australian embayment: Comparison of shallow seagrass, reef-algal and unvegetated sand habitats, with emphasis on their importance to recruitment. *J. Exp. Mar. Biol. Ecol.* **221**: 147-172.

Upston, J. & D.J. Booth. 2003. Settlement and density of juvenile fish assemblages in natural, *Zostera capricorni* (Zosteraceae) and artificial seagrass beds. *Env. Bio. Fishes* **66**: 91-97.