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Dear Wally

ALKIMOS WASTEWATER TREATMENT PLANT (ODOUR BUFFER REQUIREMENTS)

The Water Corporation has reviewed the advice of the Appeals Convenor and the determination of the Minister for the Environment with respect to the Alkimos-Eglington Metropolitan Region Scheme Amendment No. 1029/33.

The Minister has determined in his statement of 24 April 2006, in agreement with the Minister for Planning and Infrastructure, that an odour buffer of 600m is sufficient for the Alkimos Wastewater Treatment Plant (AWWTP). The subsequent MRS decision has inferred that further odour impacts can be mitigated by the use of an "odour channel", relying on the CEE's Report on Buffer Zone for Proposed Future AWWTP (June 2002) in considering the issue of odour buffer (450m with an urban deferred annulus of 150 m) for the AWWTP. The Water Corporation wishes to point out that this report has been superseded by a substantial body of work since 2002 which has further described the "ponding" phenomenon.

The Water Corporation remains constant in its view that it is necessary to provide a buffer zone extension to 800 m in the west and northwest for Site B, to adequately segregate sensitive land-uses (residences) from impacts from the plant, based on this work, until such time that it can be demonstrated to the satisfaction of the EPA that an alternative solution to the ponding issue exists.

The EPA recommendation on page iv of the EPA Bulletin 1207 regarding the MRS recognizes this necessity:

"The EPA recommends that a 600m buffer measured from the boundary of the WWTP should be reserved for Public Purposes, to prevent the siting of odour sensitive land uses within an area likely to be impacted by unacceptable odour levels from the WWTP." and

"An 800m buffer west and north west of the WWTP measured from boundary of the WWTP should be reserved for Public Purposes if the site is subject to ponding and an odour channel is not provided."



The odour ponding process has been clearly identified at Site B from the wind and air temperature measurements made at two monitoring stations at the site. Thus there is no doubt that ponding will occur, and will be exacerbated when the basin is deepened due to excavation to establish the AWWTP. At this point in time, as described in our PER, the only scientifically supported method of handling the ponding phenomenon is to provide a greater buffer zone downwind of the site (i.e., out to 800m to the west and north-west).

An alternative solution may be to provide the odour channel, which involves removing one side of the basin to allow cold air to drain horizontally from the basin thereby minimising the risk of formation of a vertically stratified pond. The Water Corporation recognises the use of an odour channel *may* mitigate the effects of ponding but the viability and effectiveness requires further investigation before any reliance can be placed upon it as a solution to the problem.

If found to be technically and scientifically viable, the channel would also create an ecological footprint. It may need to be of the order of 200m+ wide, have its own buffer of as yet undetermined size, and would need to penetrate the coastal fore-dune to achieve grade to drain to the coast, and not "pond" behind those dunes.

The Water Corporation is firmly of the view that, should Site B be found acceptable, the precautionary principle should apply to the establishment of the odour buffer. It should be extended 800m to the west and north-west (beyond that reflected in the MRS), with a commitment to reduce the buffer to an appropriate size in the future, once the channel concept has been fully evaluated and endorsed by the EPA. As this is likely to take some time the Water Corporation expects this would occur through a Section 46 process.

Attached please find a more detailed technical description of the Water Corporation's concerns, to inform the relevant technical specialists in the EPASU.

The Water Corporation requests these wider strategic concerns are taken into account by the EPA in finalising its determination on the Public Environmental Review for the AWWTP. Should you have any queries or require clarification regarding this matter, please contact Peter Moore, Acting Chief Operating Officer on telephone 9420 2660.

Yours sincerely



Peter D Moore

ACTING CHIEF OPERATING OFFICER

Attachment: Technical document.

ODOUR BUFFER

In the MRS determination, the Appeals Convenor's advice, the Minister's determination and the subsequent West Australian Planning Commission Report on Submissions appear to rely heavily upon CEE's Report on Buffer Zone for Proposed Future AWWTP (June 2002) in considering the issue of odour buffer (450m with an urban deferred annulus of 150 m) for the AWWTP, and selectively reviews more recent and relevant work which has been provided to inform the process. The Water Corporation is concerned that the 2002 report relied upon is not relevant as the basis for buffer determination for the case presented for the following reasons:

- The modelling criteria used in the 2002 report was the 7 OU at 99.9 percentile at 3 minute averaging. The 7 OU criterion was used based on the assumption that it corresponded to the level of "distinct" odour for a 3 minute averaging period.
- Wind-files used in the modelling were NOT from data collected in the Alkimos area, whereas subsequent reports utilise wind-file data collected on the proposed site.
- There was a substantial variation between the contours predicted using the three different wind files (Hope Valley, Swanbourne and Caversham), illustrating the importance of on-site wind measurements.
- The 2002 report raised concerns that the topography could cause ponding of cool air at night, and as a consequence actual odour levels would be higher than predicted using AUSPLUME. To establish the frequency and strength of cool air ponding, the recommended on-site measurement program involved two wind stations. Specialist advice was obtained from CSIRO to define this program.
- An updated report (CEE, 2004), using on-site measurements collected since April 2002, has been available to the MRS determination.

Furthermore, a substantial body of work since 2002 has further described the "ponding" phenomenon much of which has discounted or ignored in the MRS determination. These works should be read in conjunction with each other, not selectively relying upon one aspect.

The body of work includes:

- Consulting Environmental Engineers (2004). Report on Buffer Zone for Proposed Future Alkimos Wastewater Treatment Plant, Version 7. April 2004
- Borgas MS, CSIRO. CEE (2005) Alkimos emissions and dispersion estimates, February 2005.
- Wallis I, CEE, (2005), Ponding at Alkimos, February 2005
- Borgas MS, CSIRO. CEE (2005) Alkimos emissions and dispersion estimates FINAL REPORT, MARCH (but listed as February) 2005.
- Borgas MS, CSIRO. CEE (2005) Alkimos emissions and dispersion study: Supplementary Material, March 2005.
- Borgas MS, CSIRO. CEE (2005) Events, March 2005.
- Wallis I, CEE, (2005), Ponding at Alkimos at Site B, April 2005

As a result of this work, the Water Corporation remains constant in its view that it is necessary to provide a buffer zone extension to 800 m in the west and northwest for Site B, to adequately segregate sensitive land-uses (residences) from impacts from the plant.

The EPA recommendation on page iv of the EPA Bulletin 1207 regarding the MRS recognized this necessity:

"The EPA recommends that a 600m buffer measured from the boundary of the WWTP should be reserved for Public Purposes, to prevent the siting of odour sensitive land uses within an area likely to be impacted by unacceptable odour levels from the WWTP." and

"An 800m buffer west and north west of the WWTP measured from boundary of the WWTP should be reserved for Public Purposes if the site is subject to ponding and an odour channel is not provided."

The basis for dismissing the necessity for the 800m extension of the odour buffer to the west and Northwest at Site B appears to be reliance upon the assumption of a viable and effective "odour channel" referred to in the EPA's advice, above.

Odour Channel

Site B is subject to odour ponding, clearly identified at Site B from the wind and air temperature measurements made at two monitoring stations at the site. Thus there is no doubt that ponding will occur, and will be exacerbated when the basin is deepened due to excavation to establish the AWWTP. The Water Corporation believes that the best way to manage the ponding phenomenon is to provide a greater buffer zone downwind of the site (i.e., out to 800m to the west and north-west).

An alternative solution may be to provide the odour channel, which involves removing one side of the basin to allow cold air to drain horizontally from the basin thereby minimising the risk of formation of a vertically stratified pond. The Water Corporation recognises the use of an odour channel *may* mitigate the effects of ponding but the viability and effectiveness requires further investigation before any reliance can be placed upon it as a solution to the problem (i.e. it remains a hypothetical solution). Specialised technical assessment will be necessary.

Even if it is found to be technically and scientifically viable, the channel would also create an ecological footprint. It may need to be of the order of 200m+ wide, have its own buffer of as yet undetermined size and would need to penetrate the coastal fore-dune to achieve grade to drain to the coast, and not "pond" behind those dunes. The coastal fore-dune system has been identified by the EPA and reflected in the MRS as having conservation significance, and the acceptability of such an impact upon this system has not been assessed.

The Water Corporation is firmly of the view that, should the EPA find Site B acceptable, the precautionary principle should apply to the establishment of the odour buffer. It should be extended 800m to the west and north-west, with a commitment to reduce the buffer to an appropriate size with the emergence of more reliable information, effective mitigation strategies (which may include an odour channel) and demonstrated performance over time.