

State of California—Health and Human Services Agency
Department of Health Services



California
Department of
Health Services

SANDRA SHEWRY
Director



ARNOLD SCHWARZENEGGER
Governor

April 29, 2004

Mr. Hiroyuki Takatori
Kubota Corporation
Tokyo Head Office
1-3, Nihombashi-Muromachi 3-chome
Chuo-Ku Tokyo 103-8310

SUBJECT: CONDITIONAL ACCEPTANCE OF INCREASED FLUX FOR THE KUBOTA
TYPE 510 MEMBRANE

Dear Mr. Takatori:

The Department of Health Services has reviewed the report addendum entitled "Assessing the Ability of the Kubota Membrane Bioreactor to Meet Existing Water Reuse Criteria" dated April 2004, prepared by Montgomery-Watson-Harza concerning increased flux rate for the Kubota Type 510 membrane filter. This filter was previously granted acceptance by the Department in a letter dated March 18, 2003 (copy attached).

The March 18, 2003 acceptance letter for the Type 510 chlorinated polyethylene flat sheet membrane limited the flux rate at 20 gfd and a TMP of -3.0 psi based on performance studies previously conducted. Based on recent pilot studies outlined in the April 2004 report addendum, the membrane performs satisfactorily at an increased flux rate up to 42 gfd and a TMP of -5.0 psi. The Department therefore accepts the use of this membrane as a technology to meet the filtration requirements of the California Water Recycling Criteria at an increased flux of 42 gfd and a TMP of -5.0 psi in an MBR type of module.

All other conditions of acceptance outlined in the March 18, 2003 letter remain unchanged. Any proposed changes made in the physical attributes or character of this membrane shall be reviewed in advance by the Department to determine whether the modifications will require additional testing.

The Department will continue to review all proposed projects on a case-by-case basis to determine full compliance with all applicable treatment and reliability features required by the Water Recycling Criteria. This will include the collective review of all treatment unit processes, operational controls (e.g. loading rates, TMP, frequency of integrity tests), 'O&M' procedures, etc.

If you have any questions concerning this letter, please contact the undersigned at (805) 566-9767.

Sincerely,

A handwritten signature in cursive script that reads "Jeffrey L. Stone". The signature is written in dark ink and is positioned above the typed name.

Jeffrey L. Stone, Chief
Recycled Water Unit
Division of Drinking Water
and Environmental Management

cc: Montgomery Watson Harza- Samer Adham
Recycled Water Committee

State of California—Health and Human Services Agency
Department of Health Services



California
Department of
Health Services

DIANA M. BONTA, R.N., Dr.P.H.
Director



GRAY DAVIS
Governor

March 18, 2003

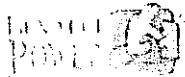
Mr. Hiroyuki Takatori
Kubota Corporation
Tokyo Head Office
1-3, Nihombashi-Muromachi 3-chome
Chuo-Ku, Tokyo 103-8310
Japan

Subject: Use of the Kubota Membrane Bioreactor (MBR) to comply
with California Water Recycling Criteria

Dear Mr. Takatori:

By transmittal memo dated February 26, 2003, Montgomery Watson Harza, Consulting Engineers, requested Departmental approval of the Kubota Membrane Bioreactor (MBR) filtration treatment unit as an acceptable filtration technology for compliance with the State of California Water Recycling Criteria (Title 22). Accompanying this request was a report prepared by Montgomery Watson Harza entitled "Assessing the Ability of the Kubota Membrane Bioreactor to Meet Existing Water Reuse Criteria, dated February 2003. The report was prepared under a grant from the U.S. Bureau of Reclamation and outlines findings from a study conducted in the City of San Diego, California. The Department has reviewed this report and offers the following comments.

The Kubota MBR filtration system evaluated utilizes the Type 510 chlorinated polyethylene flat sheet membrane with a nominal pore



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size of 0.4 micron. The membranes are submerged and operated under vacuum pressure with a maximum test flux of 20 gallons per square foot per day (gfd).

The California Water Recycling Criteria recognize membrane filtration as an acceptable filtration technology provided prescribed performance requirements (i.e. turbidity) are reliably met. The turbidity performance criteria require that the filtered wastewater not exceed any of the following:

1. 0.2 NTU more than 5 percent of the time within a 24-hour period; and
2. 0.5 NTU at any time.

The demonstration studies conducted using the Kubota MBR have sufficiently demonstrated the ability to produce an oxidized wastewater and the membranes ability to comply with the above stated turbidity performance requirements. In addition, virus seeding experiments demonstrated the processes ability to achieve a 1-log virus reduction at the 50th percentile. Therefore, the Department of Health Services accepts the use of this membrane, identified as the Type 510 chlorinated polyethylene flat sheet membrane with a nominal pore size of 0.4 micron, as a filtration technology for use in compliance with the Water Recycling Criteria. Based on the performance data, the membrane filtration units will be limited to a maximum loading rate of 20 gfd and a maximum operating vacuum pressure of -3.0 psi.

The acceptance of your technology is specific to the Kubota Type 510 chlorinated polyethylene flat sheet membrane with a nominal pore size of 0.4 micron. Any proposed changes made in the physical attributes or character of this membrane shall be reviewed in advance by the Department to determine whether the modifications will require additional testing.

The Department will continue to review all proposed projects on a case-by-case basis to determine full compliance with all applicable treatment and reliability features required by the Water Recycling Criteria. This will include the collective

review of all treatment unit processes, operational controls (e.g. loading rates, TMP, frequency of integrity tests), 'O&M' procedures, etc.

If you have any questions concerning this letter, please contact the undersigned at (805) 566-9767.

Sincerely,

Original Signed

Jeffrey L. Stone, Chief
Recycled Water Unit
Division of Drinking Water

cc: Enviroquip - Jim Porteous
Montgomery Watson - Samer Adham
City of San Diego - Steve Lagos
Recycled Water Committee

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