I. PROPOSED INTERIM AGRICULTURAL POLLUTION ABATEMENT PLAN

Any abatement plan for the muck farms should have the objective of reducing the net loading of nutrients and other contaminants to a negligible level at the earliest possible time.
To attain this objective, a four point pollution abatement plan is proposed. The elements of this plan are as follows:

1. Interim Abatement

   Immediate steps should be taken to reduce the quantity of nutrients and other contaminants by the use of all practical techniques. These actions should be adequately documented and monitored to assess efficiency and provide information for evaluating cost-effectiveness.

2. Monitoring

   Efforts should be intensified to obtain complete, accurate records of the quantity and quality of water discharged from the muck farm pumps.

3. Long-Range Abatement

   Detailed planning should be initiated to document the action that will be taken to attain the plan objective.

4. Research

   A detailed interdisciplinary research program should be initiated to collect information which may be needed to select a long-range abatement plan from the alternatives developed under #3 above.

II. INTERIM IMPLEMENTATION PLAN

1. General Implementation Responsibilities

a. Primary implementation responsibility should reside with the individual farmers and Central Florida Agricultural Institute with assistance of all agencies concerned.

b. The actions taken and plans developed should be closely coordinated with the East Central Florida Regional Planning Council, which is developing a Basin-wide Water Quality Management Plan for this area.

2. Recommendations for Implementation

Recommendation 1. - *Interim Abatement*

Immediate attention should be directed towards reducing the quantity of nutrients being discharged by the muck farm drainage pumps. All actions should be adequately documented and monitored. A description of action being taken towards this objective should be prepared within 14 days from initiation, followed by monthly reports documenting and monitoring implementation.

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There are at least five interim abatement actions which warrant consideration.

1. Diversion of pump effluents to marsh areas where practicable.
2. Reduction of the quantity of water entering the farms through the flap valves by more stringent water management.
3. Stopping the practice of field flooding.
4. Confinement of pumping to periods when water quality is good.
5. Reduction of rates of fertilization.

The effectiveness of these steps has not been determined. Therefore, it is important that implementation of interim abatement measures be adequately documented and monitored.

Implementation of this plan element should be the primary responsibility of the individual farmers and the Central Florida Agricultural Institute. The local regulatory agencies should be able to provide assistance in monitoring abatement measures.

Recommendation 2. - *Monitoring*

a. Maintenance of accurate time-of-operation records for all pumps and flap-valve controlled inlet pipes should commence immediately.

b. Water quality sampling of pump effluent discharges should be continued and intensified with particular attention to pumping stations for which limited data are available. The sampling program should be designed to incorporate the following objectives:

   1. Greater correlation of water quality samples with immediately preceeding farm activities, i.e., flooding, cropping, pumping and rainfall.

   2. A better understanding of water quality variation during a pumping cycle, by frequent sampling between initiation and termination of pumping at a given station.

c. A network of rain guages should be established on all muck farms and adjacent upland areas. Accurate rain guages should be installed and maintained after consultation with appropriate meteorological authorities.

It is anticipated that establishment of stations on at least one mile centers, will be necessary.

(Suggested Timing: Monthly Reports)

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Accurate determination of water inflow and outflow to and from the farms is an extremely difficult technical task. The various flows, however, can be estimated, given accurate time of operation records for all pumps and flap valve pipes. When coupled with precise flow measurements at a control site and other hydrologic information such as rainfall, a substantial increase in the accuracy of the farm flow estimates should be attained.

Implementation of this recommendation should be the responsibility of all concerned agencies.

Recommendation 3. - *Long Range Abatement*

Detailed engineering feasibility studies should be undertaken immediately on a pump by pump basis to demonstrate how nutrients and other contaminants will be controlled.

A contingency abatement plan, with alternative plans and implementation schedules, should be prepared within 120 days from initiation.

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Work conducted by the East Central Florida Regional Planning Council indicates that a holding basin or reservoir system is necessary for allabatement alternatives, except ceasing operations. It has further been indicated that disposal of the excess water, if necessary, to balance the holding basin(s) can be best carried out by diversion to land areas.

The contingency abatement plans should incorporate the above alternatives or any more cost-effective alternatives that may be developed in the planning process. The plans developed should include consideration of the possibility in terms of comparative cost estimates, that abatement measures for the Lake Apopka farms cannot be incorporated into the Lake Apopka Restoration Project.

Implementation of this element of the plan should be the responsibility of the individual muck farmers and the Central Florida Agricultural Institute, Inc. Close coordination should be maintained with the regulatory agencies and the Basin planning agency.

Recommendation 4. - *Data Collection*

A well designed, intensive data collection project should be initiated on a controlled, representative area of the farms.

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The minimum objectives of this project should include:

1. Accurate determination of pumpage.
2. Correlation of pumpage with rainfall, groundwater hydrology and farming practices, in terms of an accurate water budget.
3. Determination of the relationship between time-of-operation for the pumps, actual pumpage, and related hydrological variables to permit more accurate estimation of pumpage from other muck farm pumps through the use of time-of-operation records and other data.
4. Definition of pumpage water quality variations as a function of farming practices, rainfall, etc.

The additional information developed under this recommendation may be necessary to select the most effective alternative from those developed in Recommendation 3.

This project should be initiated immediately and completed within 6 months from the date of initiation.

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