

ANIMAL AND POULTRY WASTE MANAGEMENT CENTER

NORTH CAROLINA STATE UNIVERSITY

BYLAWS (approved in March 2008)

PREAMBLE

The Animal and Poultry Waste Management Center (APWMC) was established in 1996 per the University of North Carolina system protocol governing Centers, Institutes, and Laboratories. Original mission of APWMC has been to support research, demonstration, and educational efforts related to environmental impacts of animal production agriculture. Center's activities include multidisciplinary interaction with industry, government and other research institutions for development and environmental performance verification of technologies that contribute to sustainable agribusiness in the state and nation. Center's mission has not changed over time though it was enhanced under new circumstances. In order to effectively and efficiently address new and evolving opportunities and challenges impacting animal production agriculture and related Center's operations it is necessary to update and modify the organizational structure and bylaws of the APWMC.

1. INTRODUCTION

The poultry, swine, dairy and beef industries represent critical components of agribusiness in North Carolina. These industries account for approximately 68 percent of the state's farm-gate income (i.e. \$5.6 of 8.3 billion). The quantities of livestock and poultry necessary to sustain this agribusiness sector produce tons of manures and litters, hatchery by-products, feathers and hair, animal mortalities, processing offal and processing waste-waters. Although changes have occurred regarding improved waste management practices in these industries during the past decade, environmental issues including build up and/or emissions of targeted environmental variables to soil, water, and air media continue to impact the and influence the sustainability, potential growth and economics of animal production agribusiness. Changes have also occurred during the past decade regarding objective knowledge related to operational, technical and economic feasibility of existing, new and emerging waste treatment technology. Collectively, selective research, teaching and outreach is needed to capitalize on this gained knowledge to continue to reduce the environmental impact of animal production agriculture and to improve treatment and management procedures for converting manures, litters, and process waste into aesthetically acceptable and economically valuable products such as bioenergy and soil amendments. Recent legislation at both the state and federal levels are providing incentives further justifying the need for this selective research, teaching and outreach.

1.1 MISSION, GOALS AND OBJECTIVES

Numerous alternative waste handling procedures have been developed and proposed by researchers at this and other institutions, including the private sector. However, only a few of these alternatives have been adequately evaluated under objective and commercial scale conditions due, in part, to the lack of a comprehensive systems oriented infrastructure and the associated operational and R&D staff resource requirements to pursue aggressive innovative waste treatment. In addition, many of the developed technologies that have shown potential for economically viable by-product development require value engineering and market development to be practical for waste treatment conversion initiatives ant the state or national level.

1.1.1 MISSION

The APWMC provides infrastructure, programs, and assistance for innovative new basic and applied approaches to animal waste management with emphasis on development of knowledge and waste management options contributing toward the enhancement of North Carolina's and the nation's animal production industries as well as improvement of the environment and quality of life for all citizens.

1.1.2 GOALS

1. Provide objective scientific and economic based assistance to animal agriculture production industries and associated citizens in North Carolina relative to waste and residuals management, as well as environmental impact issues associated with waste and residuals management.
2. Serve to protect the environment and efficiently utilize North Carolina's natural resources through improved animal and poultry waste and residuals management practices on and around production and processing facilities.

1.1.3 OBJECTIVES

1. Provide facilities and associated equipment (*i.e.*, the infrastructure), for conducting research and extension educational activities on the management and utilization of animal waste products and residuals; and for the development of economically and environmentally acceptable procedures for conversions of these wastes into value-added products for commercial market development
2. Provide key and expert personnel to operate a research based animal waste processing facility and its equipment on a daily basis and to work with the faculty and industry groups in conducting research and extension educational activities.
3. Provide the infrastructure that will allow faculty and cooperating organizations associated with the APWMC to be successfully competitive for individual and multi-disciplinary research

funding on a national basis in the animal waste management arena.

4. Provide economically feasible and safe alternatives for handling and recycling by-products and wastes produced by industries in the course of food production.
5. Facilitate in-service training in new technologies for waste management for extension agents, agricultural agencies, waste management system operators, agribusiness personnel, and other technology-user groups.
6. Assist relevant state and federal agencies with on farm waste treatment conversion initiatives.

The mission, goals, and objectives of the APWMC are consistent with the mission of North Carolina State University in its unique role as the state's land-grant Research I University. The APWMC will enhance basic and applied research and public service activities related to waste management which in turn will contribute to NCSU mission of improving the quality of life and economic viability of North Carolina and fulfilling its commitment to active stewardship of the state's environmental resources.

1.2 GRADUATE TRAINING AND INVOLVEMENT

Graduate students from a number of disciplines and colleges will be involved with research and extension activities conducted using the APWMC facilities and sponsored programs. However, these students will continue in their present areas of graduate study, and no new "specialized" graduate programs will be involved. A need for the development of Graduate Assistantships, to support the conduct of research programs funded by the APWMC is anticipated, and has recently been accomplished through some of the industry sponsored research and USDA Special Grants awarded to the APWMC. Faculty associated with the APWMC will serve on graduate committees of students affiliated with this work.

1.3 FACULTY INVOLVEMENT

Current and pending waste management projects and programs for the NCSU College of Agriculture and Life Sciences (CALS) and other NCSU Colleges as well as other UNC institutions involve numerous departments and faculty. The APWMC will continue to promote such broad-based approaches to future animal waste research conducted in conjunction with the APWMC and to enhance the important dimension of university/industry collaboration.

1.4 FUNDING SOURCES

Granting Agencies: Proposals will continue to be submitted to obtain grant funds through private, state and federal agencies. Awards of \$ 0.5 - 2.0 million per year are targeted. Soliciting of additional funding through industrial membership in the APWMC is no longer anticipated, however industrial funding for targeted projects and initiatives will continue. Historically and recently (FY 2007/08) awards (special and competitive grants) within the

targeted award range referenced have been accomplished from agencies such as USDA, USEPA, NC Clean Water Management Trust Fund, and NC Environmental Enhancement Grant Fund. The average award amount received in the last 5 years is approximately \$1.26 million per year.

Annual budget for day to day APWMC operation is estimated as follows:

Waste Processing Facility operations (current services):	\$	60,000
Supplies / Travel:		25,000
Personnel salary and fringe (Support Staff):		375,000
Annual Total	\$	460,000

Anticipated funding for the annual day to day APWMC operating budget is estimated as follows:

NCARS Budget:	\$	150,000
APWMC Waste Processing Facility usage (services fees):		60,000
Grants:		250,000
Annual Total	\$	460,000

1.5 JUSTIFICATION FOR CONTINUATION of APWMC OPERATIONS

The magnitude and economic importance of the agricultural food animal industry in North Carolina was described above. There is little doubt that future economic stability of this industry will be impacted by its waste management practices. Federal and state regulatory agencies are moving toward requiring that waste minimization, and on-site waste recovery and recycling replace land application as the predominant method of waste disposal.

An overview of current waste management practices utilized by the agricultural food animal industry illustrates the need for alternative waste management technologies. Most manures and litters are currently being applied either in the raw form or as compost to crop and pasture land in the areas where they are being produced. In many cases, concentrated animal units now produce more nutrients than can be utilized by the crops being grown in the local area (based on the nutrient requirements of those crops). Over application of such materials can result in the buildup of nitrates, phosphates, other chemicals and pathogens in the soil that hold the potential for polluting ground and/or surface waters.

In other cases, primarily for swine and egg production stocks, manure is collected in lagoons where naturally occurring bacteria, primarily anaerobic species, are used to break down and reduce the amount of waste produced. The liquid from these lagoons is pumped onto nearby land for its fertilizer value. Anaerobic bacteria in such lagoons produce methane gas (a potent greenhouse gas), which can be captured and utilized for the generation of heat, hot water and electricity. Although technically feasible and implemented in some parts of the world, the

adoption of such alternatives in North Carolina and elsewhere will depend on the ability to produce and market the energy captured at a return that justifies the capital and operating investment.¹ Additional concerns with anaerobic waste treatment lagoons include the volatilization of ammonia with release into the atmosphere. Such ammonia may contribute to small airborne particulates (PM_{2.5}) and water pollution through atmospheric deposition.

Large quantities of water are used in animal processing plants. The waste water from these plants must be treated to standards before being released. Such waste waters contain large quantities of blood, fat and protein; flocculants are currently used to create Dissolved Air Flotation (DAF) sludge to remove these materials. The DAF sludge is extremely difficult to deal with, has little nutritive value, and is currently being press dried and land applied. New improved, economically-viable methods for separating these materials from processing waste waters must be developed to allow better purification and recovery of the potentially valuable nutrients contained in these waste waters. Current research underway at the APWMC is addressing this need. For example, a pilot plant that is being donated to the APWMC and that has been used for several years at food processing and slaughter plants in Canada will provide an opportunity to evaluate wastewater treatment using economical and low operating requirement systems. A separate APWMC project, competitively funded by the Golden Leaf Foundation Fund is exploring ways to utilize DAF sludge to enhance bio-energy recovery from anaerobic digested animal manures.

Collectively the APWMC will facilitate progress in research, development, and extension/education related to animal waste management that is not feasible for any single individual faculty program or department. The integration of numerous NCSU faculty and departments, and the APWMC facilities has resulted in synergistic outcomes not possible through any other existing mechanism – this approach will continue. The resulting technology, management practices, and knowledge have the potential for tremendous economic and environmental impacts for the benefit of society.

2. APWMC MANAGEMENT

2.1 ORGANIZATIONAL STRUCTURE

General oversight of the APWMC is provided by the Dean of CALS through the offices of the Director of the North Carolina Agricultural Research Service, and the North Carolina Cooperative Extension Service. The APWMC will continue to be operated as an organized research and extension program with day-to-day administrative placement in the CALS Department of Poultry Science.

The organizational structure for the APWMC includes a Director and an Associate Director (APWMC Management), the staff of the APWMC Waste Processing Center (unit manager and laboratory mechanic), an office staff of 1-2 persons (total dependent upon grant requirements),

¹ Recent ratified legislation in NC (Senate Bills 3 and 14650 provide such incentives for adoption of such technology and the APWMC is providing expertise in this area
APWMC charter and bylaws March08.doc

a technical staff of 1-3 EPA time-limited positions (for example – research associates with total dependent upon grant requirements).

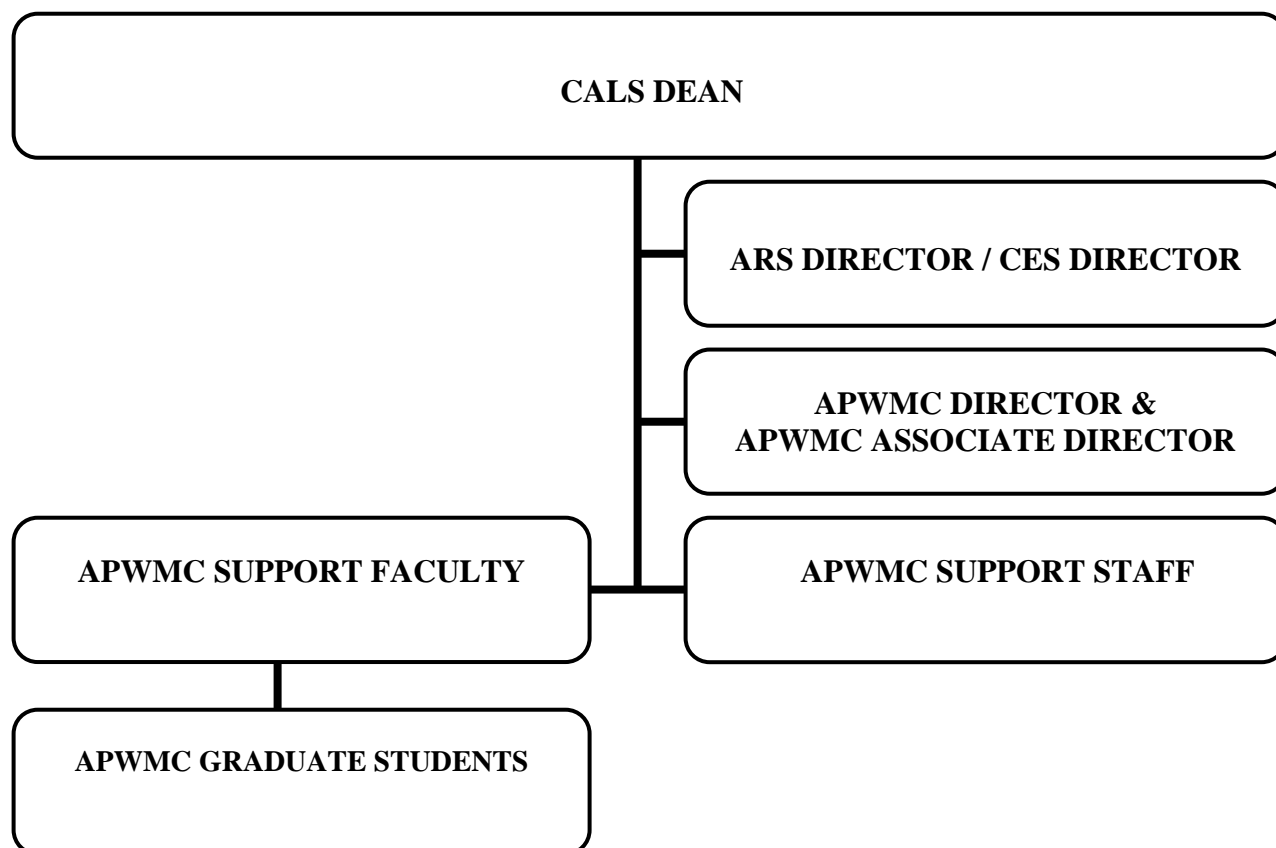
Program direction will be developed by the entire animal waste management interest group at NCSU, with feedback to the Director and Associate Director.

It is the responsibility of the APWMC Management to insure the rights of the NCSU faculty involved in the APWMC within the University's academic freedom and tenure policies. Participation of any faculty with the APWMC will be viewed as a university-related responsibility. Contributions made by faculty to the APWMC will be considered at times of promotion, tenure and salary increases as part of their University responsibilities. The APWMC Management will also have the responsibility of protecting the rights of graduate students whose funds are derived from the APWMC.

The Director will work with NCSU faculty with interest in animal waste management, the various food-animal industry groups and others (including government agencies, commodity and environmental interests groups, and legislative officials) to identify key animal waste management needs in order to establish both long-range and short-term goals and objectives for the research and extension efforts of the APWMC. The Director and Associate Director will have administrative authority in the operation of the APWMC, including the approval of research and extension projects to be conducted or sponsored by the APWMC through any funding mechanisms that may be available. Final decisions will ultimately be approved by the NCSU administrator in charge (Dean of CALS or his/her designee).

The overall annual budget plans and spending for the APWMC will be developed and reviewed annually by the Director and Associate Director.

2.2 ORGANIZATIONAL CHART



3. APWMC POLICIES

3.1. AMENDMENT POLICY

The Bylaws may be amended based on recommendation by the Director and Associate Director with approval of the CALS Dean. A copy of the amended Bylaws will be sent to the Vice Chancellor for Research, Outreach and Extension for final review and approval and updating of APWMC files, and for forwarding to the General Administration of The University of North Carolina.

3.2 PUBLICATIONS POLICY

Publication of the research conducted under the auspices of the APWMC is strongly encouraged. In order to prevent untimely publication of potentially patentable research, a copy of all proposed publications will be sent to each research sponsor (if appropriate and required in the

funding agreement) for review. Any research sponsor can request a maximum six-month delay in publication from the date of notification if it is determined that any patentable material is contained in the publication. The sponsor must respond in writing to the Director within thirty (30) days of receipt of notification in order to request delay of publication.

Under no circumstances will a student's thesis or dissertation, for which funding has been derived from the APWMC, be delayed so as to cause a delay in the student author's graduation.

3.3 SOFTWARE COPYRIGHT POLICY

All software developed by the Center will be copyrighted by the University.

3.4 EXTERNAL PROJECTS POLICY

The availability of the APWMC facilities will provide unique opportunity for interested parties to test and develop and demonstrate innovative waste treatment applications. Such use of the facilities for "external" projects will be encouraged by the APWMC. However, the availability and priority of the facilities use, for all projects, will be managed and determined, on an individual basis by the APWMC Director or Associate Director. The fee structure for the use of APWMC facilities for "external" projects will be determined by the APWMC Director and Associate Director per standard university policy for such "service" agreements. Approval by the ARS and/or CES Directors and/or CALS Dean will be required.

4. OPERATING PROCEDURES

4.1 INDUSTRY PERSONNEL AS VISITING SCIENTISTS

Industry personnel will have the right to participate directly in the day-to-day operation of the APWMC as visiting scientists or other appropriate title. Lengths of assignment and responsibilities will be determined on an individual basis and approval by the ARS and/or CES Directors and/or CALS Dean will be required.

4.2 "PHASE-OUT" POLICY

If a decision is ever reached to discontinue the APWMC, the Dean of CALS will notify the NCSU Vice-Chancellor for Research and Graduate Studies. The phase-out period for the Center will be sufficient to permit an orderly termination or transfer of contractual obligations, and will allow ample time to find alternate employment for APWMC staff. Normally the "phase-out" period will be approximately one year after the end of the academic year in which the decision is made to discontinue the unit.