Program Description
Animal Care and Use Program

East Carolina University
File #677

Greenville, NC

December 2, 2019

For
AAALAC International

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Table of Contents

Section 1. Introduction 1
Section 2. Description 5
I. Animal Care and Use Program 5
A. Program Management 5
1. Program Management Responsibility 5
a. The Institutional Official 5
b. Role of the Attending Veterinarian 5
c. Interinstitutional Collaborations 6
2. Personnel Management 7
a. Training, Education, and Continuing Educational Opportunities 7
i. Veterinary and Other Professional Staff 7
ii. Animal Care Personnel 8
iii. The Research Team 9
b. Occupational Health and Safety of Personnel 12
i. Institutional Oversight 12
ii. Standard Working Conditions and Baseline Precautions 14
1) Medical Evaluation and Preventive Medicine for Personnel 14
2) Personnel Training Regarding Occupational Health and Safety 17
3) Personal Hygiene 18
4) Standard Personnel Protection 19
iii. Animal Experimentation Involving Hazards 22
B. Program Oversight 28
1. The Role of the IACUC/OB 28
a. IACUC/OB Composition and Function 28
b. Protocol Review 29
c. Special Considerations for IACUC/OB Review 33
i. Experimental and Humane Endpoints 33
ii. Unexpected Outcomes that Affect Animal Well-being 34

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Uploaded to Animal Research Laboratory Overview (ARLO) on 08/26/2021

iii. Physical Restraint 34
iv. Multiple Survival Surgical Procedures 36
v. Food and Fluid Regulation 37
vi. Use of Non-Pharmaceutical-Grade Drugs and Other Substances 38
vii. Field Investigations 38
viii. Animal Reuse 38
2. Post-Approval Monitoring 39
3. Investigating and Reporting Animal Welfare Concerns 41
4. Disaster Planning and Emergency Preparedness 41
II. Animal Environment, Housing and Management 42
A. Animal Environment 42
1. Temperature and Humidity 42
2. Ventilation and Air Quality 44
3. Life Support Systems for Aquatic Species 45
4. Noise and Vibration 46
B. Animal Housing 47
1. Primary Enclosures 47
2. Environmental Enrichment, Social, and Behavioral Management 47
a. Environmental Enrichment 48
b. Social Environment 49
c. Enrichment, Social and Behavioral Management Program Review 49
d. Procedural Habituation and Training of Animals 50
e. Sheltered or Outdoor Housing 50
f. Naturalistic Environments 51
C. Animal Facility Management 51
1. Husbandry 51
a. Food 51
b. Drinking Water 55
c. Bedding and Nesting Materials 56

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Uploaded to Animal Research Laboratory Overview (ARLO) on 08/26/2021

d. Miscellaneous Animal Care and Use Equipment 57
e. Sanitation 58
i. Bedding/Substrate Change 58
ii. Cleaning and Disinfection of the Micro- and Macro-Environments 59
f. Conventional Waste Disposal 60
g. Pest Control 61
h. Weekend and Holiday Animal Care 61
2. Population Management 62
a. Identification 62
b. Breeding, Genetics, and Nomenclature 62
III. Veterinary Care 63
A. Animal Procurement and Transportation 63
1. Animal Procurement 64
2. Transportation of Animals 65
B. Preventive Medicine 66
1. Animal Biosecurity 66
2. Quarantine and Stabilization 67
3. Separation by Health Status and Species 68
C. Clinical Care and Management 69
1. Surveillance, Diagnosis, Treatment and Control of Disease 69
2. Emergency Care 71
3. Clinical Record Keeping 72
4. Diagnostic Resources 73
5. Drug Storage and Control 74
D. Surgery 74
1. Pre-Surgical Planning 74
2. Surgical Facilities 75
3. Surgical Procedures 77
4. Aseptic Technique 78
5. Intraoperative Monitoring 79

Obtained by Rise for Animals.
Uploaded to Animal Research Laboratory Overview (ARLO) on 08/26/2021

6. Postoperative Care 79
E. Pain and Distress 80
F. Anesthesia and Analgesia 81
G. Euthanasia 82
IV. Physical Plant 85
A. Facilities Overview 85
B. Centralized (Centrally-Managed) Animal Facility(ies) 85
C. Satellite Animal Housing Facilities 87
D. Emergency Power and Life Support Systems 88
1. Power 88
2. Other System Malfunctions. 91
E. Other Facilities 92
1. Other Animal Use Facilities 92
2. Other Animal Program Support Facilities 92

Appendices

Appendix 1: Glossary of Abbreviations and Acronyms
Appendix 2: Summary of Animal Housing and Support Sites
Appendix 3: Line Drawings
Appendix 4: Organizational Chart(s)
Appendix 5: Animal Usage
Appendix 6: Personnel Medical Evaluation Form
Appendix 7: IACUC/OB Membership Roster
Appendix 8: IACUC/OB Minutes
Appendix 9: Blank IACUC/OB Protocol Form
Appendix 10: IACUC/OB Periodic Report
Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary
Appendix 12: Aquatic Systems Summary – Part I & II
Appendix 13: Primary Enclosures and Animal Space Provisions
Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment
Appendix 15: Facilities and Equipment for Sanitizing Materials
Appendix 16: Lighting Summary
Appendix 17: Satellite Housing Facilities

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Program Description

Instructions for Completing and Submitting the Program Description for the Institutional Animal Care and Use Program

Section 1. Introduction

A. State the name of the program unit and, if applicable, its parent organization. List all organizations (schools, centers, etc.) included within the program unit.

The accredited unit is East Carolina University (ECU), File #677. ECU is accredited campus-wide and includes vertebrate animal use within the [redacted]

B. Give a brief overview of the institution, its purpose and how the animal care and use program relates to the mission of the institution.

Since its founding in 1907 with a primary mission of training teachers, ECU has grown to support approximately 29,000 students, and currently offers undergraduate, graduate, and professional degree programs in a wide variety of disciplines. The animal care and use program supports teaching activities and biomedical, basic science, and biological research across the entire campus.

C. Note that AAALAC International's three primary standards are *the Guide for the Care and Use of Laboratory Animals* (*Guide*), NRC, 2011; the *Guide for the Care and Use of Agricultural Animals in Research and Teaching* (*Ag Guide*), FASS, 2010, and the European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes, Council of Europe (ETS 123). Other regulations and guidelines used (U.S. Department of Agriculture (USDA), Public Health Service (PHS) Policy, Good Laboratory Practice (GLP), Canadian Council on Animal Care (CCAC), etc.) may also apply. Describe which of the three primary standards and other regulations and guidelines are used as standards for the institutional animal care and use program and how they are applied. For example, an academic institution in the United States with an Office of Laboratory Animal Welfare (OLAW) Assurance may use the standards of the *Guide* and PHS Policy for all animals, the Animal Welfare Act regulations for covered species, and the *Ag Guide* for agricultural animals used in agricultural research and teaching (see also *Guide*, pp. 32-33). In the European Union, the standards applied might be the *Guide*, ETS 123, Directive 2010/63, and any country-specific regulations.

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ECU uses the *Guide* and PHS Policy for all vertebrate species, and also follows the Animal Welfare Act for USDA covered species.

D. Describe the organization and include an accurate, current, and detailed organizational chart or charts (see **Appendix 4**) detailing the lines of authority from the Institutional Official to the Attending Veterinarian, the Institutional Animal Care and Use Committee/Oversight Body (IACUC/OB), and the personnel providing animal care. Please include the title, name (*Note:* For individuals whose information is publically available, provide the titles and names; for individuals whose information is not publically available, you may provide titles only.), and degree (if applicable) of each individual at the level of supervisor or above. Names of animal care staff below the title of supervisor need not be included, but the titles and number of animal care personnel under each supervisor should be included. If animal care responsibility is administratively decentralized, including the management of satellite housing areas/locations, the organizational chart or charts must include all animal care programs, indicating the relationship between each administrative unit and personnel, the Attending Veterinarian, and the Institutional Official.

Mary Farwell, PhD, Assistant Vice Chancellor for Research, Economic Development, and Engagement, is the Institutional Official (IO). All responsibilities of this position have been delegated to Dr. Farwell by [redacted].

The IACUC is chaired by Susan McRae, PhD, and reports directly to Dr. Farwell. The IACUC oversees all ECU animal care and use activities.

The Attending Veterinarian, Dorcas O'Rourke, DVM, MS, DACLAM, reports to Dr. Farwell for ECU animal care and use program compliance responsibilities and veterinary oversight.

As Chair of the Department of Comparative Medicine (DCM) [redacted], Dr. O'Rourke directs animal care operations in [redacted] are investigator-maintained but fall under the oversight of the IACUC and Attending Veterinarian. The organizational chart is in Appendix 4.

E. Identify the key institutional representatives (including, but not limited to, the Institutional Official; IACUC/OB Chairperson; Attending Veterinarian; animal program manager; individual(s) providing biosafety, chemical hazard, and radiation safety oversight; etc.); and individuals anticipated to participate in the site visit.

Mary Farwell, PhD, Institutional Official

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Sue McRae, PhD, IACUC Chair

Dorcas O'Rourke, DVM, MS, DACLAM, Attending Veterinarian

[redacted]

F. Briefly describe the major types of research, testing, and teaching programs involving animals and note the approximate number of principal investigators and protocols involving the use of animals. As mentioned in the instructions, please complete **Appendix 5** (Animal Usage) or provide the information requested in a similar format as an Appendix.

Research areas involving animals include infectious diseases, arthritis, allergic asthma and other respiratory diseases, cardiovascular diseases, oncology, pharmacology, toxicology, immunology, ecology, behavior, neuroscience, metabolism, and trauma. Animals are used in undergraduate, graduate, medical resident, and physician instruction. There are approximately 81 principal investigators and 138 active animal use protocols (AUPs).

G. Note the source(s) of research funding (grants, contracts, etc.) involving the use of animals.

Animal based research at ECU is funded by multiple agencies, including National Institutes of Health, National Science Foundation, Department of Defense, US Fish and Wildlife Service, American Heart Association, National Multiple Sclerosis Society, North Carolina Biotechnology Center, pharmaceutical contracts, other private and non-profit organizations, and internal grant and departmental funding.

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H. List other units (divisions, institutes, areas, departments, colleges, etc.) of your organization that house and/or use animals that are not included in this Description. If any of these are contiguous, physically or operationally (e.g., same IACUC/OB, same animal care staff), with the applicant unit, describe the association. Explain why such units are not part of this program application.
Note: Questions regarding this section should be forwarded to the AAALAC Office.

N/A

I. Contract Facilities: If the institution contracts for animal care facilities or services for animals owned by the institution, the contractor and its AAALAC International accreditation status must be identified. If a contractor's animal care and use program is not accredited by AAALAC International, a brief description, following this Program Description outline, of the relevant contractor's programs and facilities must be provided. In addition, the species and approximate average number of animals housed in the contract facilities and the approximate distance between the institution's animal facility and the contract facility must be noted. Incorporation of the contractor program into the site visit schedule will be discussed with institutional representatives. If the institution does not contract for animal care facilities or services, so note.

N/A

J. Note other relevant background that will assist reviewers of this report.

[redacted] Mice are taken to procedure spaces in [redacted] for terminal use.

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Section 2. Description

I. Animal Care and Use Program

A. Program Management

1. Program Management Responsibility [*Guide*, pp. 13-15]

a. The Institutional Official [*Guide* pp. 13-14]
Describe how program needs are clearly and regularly communicated to the Institutional Official by the Attending Veterinarian, IACUC/OB, and others associated with the program.

The Institutional Official receives semi-annual reports from the IACUC describing findings from each program review. These reports identify programmatic and facility needs. The IACUC Chair and Attending Veterinarian have independent, direct access to the IO and meet with her individually or collectively as needed to discuss programmatic needs. Additionally, the IO is readily available and responsive to phone and email communications concerning the program.

b. Role of the Attending Veterinarian [*Guide*, p. 14]

i. Describe the institutional arrangement for providing adequate veterinary care. Although individual name(s) and qualifications will be described below, identify by title the veterinarian(s) responsible for the veterinary care program, including:

- a list of responsibilities
- a description of the veterinarian's involvement in monitoring the care and use of laboratory animals
- the percentage of time devoted to supporting the animal care and use program of the institution if full-time; or the frequency and duration of visits if employed part-time or as a consultant.
  Note: If preferred, this information may be provided in a Table or additional Appendix.

There are three full-time veterinarians on faculty in the Department of Comparative Medicine (DCM) at ECU who devote 100% effort to the animal care and use program. Dr. Dorcas O'Rourke serves as Attending Veterinarian and is responsible for the program of veterinary care. Drs. [redacted] assist Dr. O'Rourke. Veterinarians provide clinical and surgical care, preventive medicine, health surveillance, zoonosis monitoring, technical support, research collaboration, assistance

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in protocol preparation, model selection, husbandry and enrichment oversight, and training [redacted] Drs. [redacted] and O'Rourke serve on the IACUC. [redacted] is a member of the IBC.

ii. List others (e.g., Principal Investigators, veterinarians serving as Principal Investigators, veterinary faculty/staff, technical staff, farm managers) who have a *direct role in the provision of veterinary care* and describe their responsibilities. The Organizational Chart(s) provided in **Appendix 4** must depict the reporting relationship between these individuals and the Attending Veterinarian.
Note: If preferred, this information may be provided in a Table or additional Appendix.

Three veterinary technicians assist in the provision of veterinary care. [redacted] work closely with the veterinarians in managing clinical and surgical cases. Husbandry technicians also assist in administering treatments.

c. Interinstitutional Collaborations [*Guide*, p. 15]
Describe processes for assigning animal care and use responsibility, animal ownership and IACUC/OB oversight responsibilities at off-site locations for interinstitutional collaborations.

All vertebrate animals housed at ECU are part of the ECU animal care and use program, regardless of ownership. In cases of collaboration between ECU and other programs, an ECU faculty member serves as PI on the ECU protocol. If an ECU investigator is working at another facility or is having work done for them at another facility, a tracking protocol is developed, which includes the collaborating institution's approved protocol information, PHS Assurance number, AAALAC accreditation status, and USDA registration (if applicable).

Animals from other institutions that are transported to ECU for euthanasia and *ex vivo* tissue manipulation must have an ECU IACUC tracking protocol that describes all live animal manipulations at ECU, as well as a copy of the collaborator's protocol approval for the overall project.

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2. Personnel Management

a. Training, Education, and Continuing Educational Opportunities

Describe *how* the IACUC/OB provides *oversight* and *evaluates the effectiveness* of training programs and the assessment of personnel competencies. Describe how training is documented.
Note: Do not include details about the training program, which should be described in the following sections.

All personnel involved in the animal care and use program must take basic on-line training and repeat the training every three years. Personnel must also complete task- and procedure- specific training. Training is documented by the IACUC director, facility manager, and surgery supervisor, according to training type. The IACUC monitors outcomes (surgical success, adverse events) through semi-annual inspections, veterinary staff and animal care staff reports to the IACUC concerning adverse outcomes or complications, and protocol annual renewals.

i. Veterinary and Other Professional Staff [*Guide*, pp. 15-16]

For the Attending Veterinarian and other individuals having a direct role in providing veterinary medical care (veterinarians, other professional staff listed above, private practitioners, etc.), provide: name, credentials (including degrees), and a description of their qualifications, training, and continuing education opportunities.
Note: Please do not provide curriculum vitae of personnel; if preferred, this information may be presented in a Table or additional Appendix.

Dorcas O'Rourke, DVM, MS, DACLAM [redacted]

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[redacted]

ii. Animal Care Personnel [*Guide*, p. 16]

1) Indicate the number of animal care personnel.

DCM has 2 laboratory animal care supervisors, 10 lab animal care technicians, 4 cagewash techs, 2 surgery/vet techs, 1 diagnostic lab technician, and one special projects coordinator.

For the [redacted] facilities:
The [redacted] zebrafish [redacted] have 3 PIs, 5 graduate students, and 13 undergraduates.
The [redacted] stickleback [redacted] has one PI, one graduate student, and up to 9 undergraduates.
The [redacted] goby [redacted] has one graduate student and one undergraduate.
The [redacted] dart frog [redacted] has one PI, 4 graduate and 3 undergraduate students.

2) Summarize their training, certification level and type, experience, and continuing education opportunities provided.
Note: If preferred, this information may be provided in a Table or additional Appendix.

DCM animal care personnel experience ranges from 6 months to 37 years.

There are 2 LAT and one RLAT certified lab animal care technicians. One technician has an associate degree, and four technicians have BS/BA degrees in biology, animal science, and athletic training.

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Surgery/vet techs are ALAT and LAT certified, and one has a BS in criminal justice.

The laboratory technician has a BS degree in geography and is LAT certified.

The special projects coordinator is RLAT certified.

New employees take the on-line IACUC training and are required to attend the basic DCM animal handling class.

The vivarium manager provides new lab animal care technicians with facility SOPs, and employees read and discuss the documents with either the manager or supervisors. New employees work alongside the lab animal technician supervisors until they become comfortable with procedures. Ongoing training is provided during lab animal care technician meetings – these can be in the form of discussion of updated or new SOPs, or research presentations by investigators. In-house AALAS certification training is also offered.

Technicians can also participate in webinars presented by NABR and other organizations.

[redacted] zebrafish facility personnel take on-line IACUC training and are trained in species-specific husbandry and care by the PIs. Experience ranges from 4 months to 5 years.

Stickleback facility personnel take on-line IACUC training and are trained by the PI in species-specific care and husbandry. PI has 30 years' experience and student experience ranges from 1-3 years.

Naked goby facility personnel have taken on-line IACUC training, have been trained in species-specific husbandry and care by the PI, and have over three years' experience at ECU, in addition to experience at previous institutions.

Poison dart frog facility personnel have taken on-line IACUC training, been trained by the PI in species-specific husbandry and care, and have 3 months to 4 years' experience.

iii. The Research Team [*Guide*, pp. 16-17; 115-116; 122; 124]

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1) Describe the *general mechanisms* by which the institution or IACUC/OB ensures that research personnel have the necessary knowledge and expertise in the animal procedures proposed and the species used.

Each person listed on the AUP must complete the basic on-line training and submit the completed exam to the IACUC director. They must take animal handling and, if appropriate, aseptic surgical training classes. Additionally, they must sign an assurance that they have read information specific to the procedures and species that they are working with. Relevant experience is listed for each member of the research team on the AUP. The IACUC assesses this information during AUP review and determines if the expertise is adequate or if additional oversight is needed.

a) Briefly describe the content of any required training.

The basic on-line module covers regulations, IACUC functions, veterinary responsibilities, health and safety requirements, humane animal use, alternatives to animal use, mechanisms for reporting concerns, and other topics relevant to the animal care and use program. Animal handling and surgical training are hands-on and frequently tailored as necessary to the skill level of the participants and to the species used. Species-specific information on biology, care, and zoonoses, as well information on allergies, whistleblower procedures, blood- borne pathogens, and pregnancy are provided to all users. This information, as well as all IACUC guidelines and policies, are on the IACUC website.

b) Describe the timing of training requirements relative to the commencement of work.

Training must be completed prior to commencement of work.

c) Describe continuing education opportunities offered.

All research personnel must re-take basic on-line IACUC training every three years. Hands-on training is also available. DCM veterinarians disseminate new information and publications via emails and attend lab meetings to discuss topics. DCM also regularly schedules NABR and USDA webinars to update investigators on current regulatory issues.

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2) Describe the process(es) to ensure surgical and related procedures are performed by qualified and trained personnel, including:

- who determines that personnel are qualified and trained for surgical procedures
- the roles that the Attending Veterinarian and IACUC/OB have in this determination [*Guide*, pp. 115-116]

Relevant experience is listed on the AUP and evaluated by the IACUC and veterinarians. Aseptic technique and surgical training is taught by DCM personnel, and proficiency is noted at that time. If individuals require additional training, one-on-one training sessions are provided by DCM veterinary staff. Any surgical or procedural complications are noted by the animal care, vet tech, and veterinary staff and discussed with the PI. The veterinary staff and the IACUC also review surgical areas, records, and post-surgical animals during semi-annual inspections, and will require additional training for individuals who remain challenged.

3) Describe the training and experience required to perform anesthesia. [*Guide*, p. 122]

DCM surgical staff perform surgical anesthesia for large animals such as rabbits and pigs. They are also available and frequently perform anesthesia on other species, including finches and rodents. These individuals have considerable experience in anesthetic induction and maintenance in multiple species. DCM staff train investigators and their staff on proper use of inhalant and injectable anesthesia. DCM surgical staff is always available to assist as needed and/or requested.

4) Describe how the proficiency of personnel conducting euthanasia is ensured (especially physical methods of euthanasia). [*Guide*, p. 124]

AUPs must describe all euthanasia methods and how death is ensured. The IACUC may request that the investigator demonstrate the euthanasia method to the veterinarians and/or committee members. DCM surgery technicians typically perform euthanasia of large animal species; all three have considerable experience in humane euthanasia methods. Animal care staff performs most rodent CO2 euthanasia, and the animal care technicians have been trained on appropriate procedure. Surgery technicians and animal care staff train investigators on CO2 euthanasia. Most rodent euthanasia stations use Euthanex systems; DCM veterinarians have calculated the appropriate flowmeter

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rates for other CO2 systems, and instructions for proper use are posted at each euthanasia station.

b. Occupational Health and Safety of Personnel [*Guide*, pp. 17-23]

i. Institutional Oversight [*Guide*, pp. 17-19]

1) List the institutional entities (units, departments, personnel, *etc*.) that are involved in the planning, oversight, and operation of the institutional occupational health and safety program related to animal care and use (e.g., office(s) of environmental health, institutional health services or clinics (*including contracted health services*), industrial hygienists, Institutional Biosafety Committee(s) and/or Officer(s), Radiation Safety Committee(s) and/or Officer(s).

- Include a brief description of their responsibilities and qualifications.
- If contracted services are used, also include their location (e.g.,remote offices to which personnel must report).

The occupational health and safety program (OHSP) is primarily the responsibility of the Office Of Prospective Health, directed by [redacted] specialist in Occupational and Environmental Medicine. For the animal care and use program, [redacted] is assisted by two nurses, the biological safety officer (BSO), the associate BSO, two radiation safety officers, one laser safety officer, a nurse practitioner, and two administrative support personnel. The associate BSO has an MS in Biology. [redacted] is the Responsible Official (RO) for select agents and is a member of the Institutional Biosafety Committee and IACUC. The BSO is the Associate RO, and an IBC member, and the Associate BSO is an alternate IACUC member, an Associate RO, and a member of the IBC.

The Office of Environmental Health and Safety is responsible for reviewing chemical use and reviewing safety plans for the protection of animals and technicians. The Environmental Health and Safety Specialist (B.S. in Worksite Health, Education and Promotion) and the Health Sciences Coordinator (M.S. Environmental Health) are non-voting IACUC members.

These offices work closely with DCM and the IACUC to ensure that risks are identified and personnel are appropriately included in the OHSP.

2) Describe methods to identify work-related hazards and the processes used to evaluate the significance of those hazards in the context of duties

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and tasks. Describe both common approaches and differences, if applicable, for categories of personnel such as, but not limited to, researchers, veterinarians, husbandry staff, cage-washing staff, students, housekeeping, physical plant staff, security personnel, IACUC/OB members (including non-affiliated members), contractors, visitors, etc. [*Guide*, pp. 18-19; see also Chapters 2 and 3 in Occupational Health and Safety in the Care and Use of Research Animals, NRC 1997.].

All research personnel must be risk assessed as part of the ECU OHSP. Hazards associated with research personnel using animals are identified during AUP review. The subject matter experts serving on the IACUC (OHSP physician, BSOs, EH&S specialists) review all AUPs for hazards and make recommendations to the IACUC regarding proper procedures. The AUP will not receive final IACUC approval until the PI has obtained approval from the appropriate safety committee or subject matter expert (IBC, EH&S, Radiation Safety).

All IACUC members (inclusive of non-affiliated members) are risk assessed and included in the ECU OHSP.

DCM personnel are risk assessed and included in the OHSP at hiring and at least annually thereafter. Hazards specific to DCM staff are identified by the OHSP physician, BSOs and EH&S specialists in conjunction with DCM veterinarians. The EH&S Industrial Hygiene Specialist (M.S. Occupational Safety) conducts necessary monitoring for DCM including anesthetic gas and ethylene oxide exposure limits, indoor air quality, respirator training and fit testing, and noise levels. He also conducts hazard assessments for PPE requirements. EH&S provides ergonomic evaluations and training for personnel in DCM.

Hazards specific to support personnel groups (housekeeping, facilities, security) are evaluated by the subject matter experts in conjunction with DCM, and recommendations are made for appropriate training and personnel protection.

3) Describe methods and frequency of reassessing work-related hazards.

Safety personnel evaluate the animal facilities at least annually, identify potential facility-related hazards, and provide recommendations to facility management. They also participate in IACUC program review and semi-annual inspections, during which the compliance and knowledge of investigators are assessed to ensure that safe handling of hazardous substances is followed.

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4) Describe institutional programs or methods used to track and evaluate safety-related workplace incidents, including injuries, exposures, accidents, etc. Include the frequency of such assessments. [*Guide*, pp. 18-19]

Incidents and near misses are reported through supervisors to the Workers' Compensation Program in EH&S. If an incident or exposure occurs during normal working hours, the individual will report to the Office of Prospective Health. After hours, the individual will report to the emergency department of Vidant Medical Center. Incidents are evaluated by the appropriate offices, including EH&S for chemical and physical hazards and Prospective Health for occupational diseases, biological and ionizing and non-ionizing radiation agents, and needle sticks. Incidents can also be reported through the IACUC chair, vice-chair and attending veterinarian. Tracking is completed through the Workers' Compensation program annually. When necessary, plans are created and implemented to mitigate the risks identified during the evaluation.

ii. Standard Working Conditions and Baseline Precautions

The following section pertains to the Occupational Health and Safety Program for all personnel associated with the animal care and use program. Specific information regarding the use of hazardous agents is included in ***subsection iii*** below.

1) Medical Evaluation and Preventive Medicine for Personnel [*Guide*, pp. 22-23] *Note:* Include blank forms used for individual health assessment as **Appendix 6.**

a) Describe who (e.g., personnel assigned to job/task categories in I.A.2.b.i.2) above) receives personal medical evaluation as a component of individual risk assessment. Describe who are ***not*** included and/or exempted from personal medical evaluation. *Note:* Do not include the names of personnel.

All personnel, including Comparative Medicine faculty and staff, research investigators, their staff, students (including summer students), visiting faculty and scholars, and IACUC members (including non-affiliated members) who will work with or be around animals in the facility must be evaluated and approved by the Office of Prospective Health before an AUP can be approved and prior to granting animal facility access. Facilities Maintenance personnel,

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campus police, and housekeeping personnel do not receive a medical evaluation unless they will have direct animal exposure or there is concern regarding zoonotic exposure. However, these groups receive training on allergies, zoonoses, and other animal facility hazards by DCM. In the event that maintenance or security personnel must enter an animal room, they are provided appropriate PPE and typically are escorted by DCM staff into the room. Housekeeping personnel do not enter animal rooms or procedure areas. Signage is posted throughout all facilities and animal use areas to alert individuals to the risk of allergens.

b) Describe provisions for allowing an individual (following completion of individual health and job related risk assesments) to decline participation in all or part(s) of subsequently available medical and preventive medicine components of the institutional program, e.g., vaccinations, physical examinations, respiratory protection, as applicable. Provide an estimate (percentage) of personnel associated with the animal care and use program that have declined participation in the medical evaluation program.
Note: Do not include names of the personnel

Individuals to be enrolled in the OHSP undergo risk-based medical evaluations but may decline immunizations. Even if immunizations are declined, individuals are required to take all relevant training to ensure that they are fully aware of risks. Individuals working with primates, select agents, and vaccinia virus will not be permitted to work with these species and agents unless they comply with all requirements of the medical evaluation and preventive medicine programs. No one has yet declined participation in the OHSP.

c) Describe provisions for assuring confidentiality of medical information.

Protected health information is reviewed by medical professionals only (Prospective Health physician, nurse practitioner, and/or nurse).

d) Describe safety considerations for individuals with incidental exposure to animal care and use (e.g., contractors, personnel working in open laboratories).

Personnel working in open laboratories and other individuals incidentally exposed are apprised of risk through multiple signs placed visibly in facilities, laboratories, and other areas indicating risks associated with the specific areas.

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e) Describe general features of the medical evaluation and preventive medicine programs, within the context of work duties, including:

- pre-employment/pre-assignment health evaluation,
- medical evaluations (including periodicity),
- diagnostic tests (e.g., for tuberculosis),
- precautions for working with potentially hazardous species (e.g., nonhuman primates, sheep, venomous species)
- immunization programs, and
- procedures for communicating health related issues.

Prior to performing any animal-related work, personnel are required to undergo health evaluation by Prospective Health. This evaluation includes assessment of vaccination records, preexisting health conditions, and history of allergy or asthma. Individuals with health problems, such as animal or latex allergies, immunosuppression, or who declare pregnancy are counseled regarding any potential hazards from their work. Tuberculin skin test and/or immunizations are administered as indicated, based on occupational and animal exposure risk assessment (e.g., Hepatitis B, tetanus, influenza, measles/rubella, rabies, lab agent-specific immunizations). Training for blood borne pathogens, tuberculosis, select agents, and biological safety principles is provided. The respiratory protection program for *Brucella* and other infectious agents requires personnel at risk to be fitted with an appropriate particulate NIOSH-approved respirator.

All personnel receive training on work and/or protocol-related zoonoses, allergies, and universal precautions prior to working with the animals. After the initial evaluation, triennial health history updates are requested by the Office of Prospective Health. DCM personnel and primate users submit updates at least annually.

Veterinary, husbandry and investigative personnel who work with nonhuman primates are required to participate in semiannual tuberculosis (TB) screening. They are instructed on animal handling, personal protective equipment, bite and scratch procedures, and safe sharps methods to avoid exposure to potential Herpes B virus (*Macacine herpesvirus 1*), tuberculosis, and other zoonotic diseases of nonhuman primates. Herpes B virus exposure or “bite kits,” also known as “monkey incident kits,” are available in all nonhuman primate areas. Personnel are annually trained in procedures, and the kits contain information for personnel and health/emergency department personnel in the event an exposure occurs.

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Personnel with health-related concerns or issues are instructed to contact Prospective Health so that their concerns or issues can be addressed.

f) Describe any other entities that provide medical services (e.g., emergency care, after-hours care, special medical evaluation, contracted services). Include a brief description of their credentials and/or qualifications, and how these entities remain knowledgeable about animal- or institution-related hazards and risks.

During normal working hours, medical services for relevant personnel are provided by the Office of Prospective Health. After hours, medical services are provided through the Emergency Department (ED) of Vidant Medical Center. Written instructions are on file in the ED regarding the treatment of *Brucella* and Herpes B virus exposures. The monkey incident kit also contains specific Herpes B virus information regarding treatment and swabs for sample collection; this entire kit is transported to the ED with the person.

2) Personnel Training Regarding Occupational Health and Safety
[*Guide*, p. 20]

Describe general educational program(s) to inform personnel about:

- allergies,
- zoonoses,
- personal hygiene,
- physical injuries in animal facilities (e.g., noisy areas, large quantities of chemicals such as disinfectants, ergonomics) or species used (e.g., nonhuman primates, agricultural animals),
- other considerations regarding occupational health and safety.

Include in the description a summary of the topics covered, including:

- Entities responsible for providing the training
- Frequency of training or refresher training

Note: Do not include special or agent-specific training for personnel exposed to experiment-related hazardous agents; this will be provided in **Section iii.3** below.

Prior to beginning their work with animals, all personnel receive training on work and/or protocol-related zoonoses, allergies, and universal precautions through the ECU intranet online training course on the IACUC website. Additionally, personnel receive training for blood borne

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pathogens, tuberculosis, select agents, and biological safety principles through the ECU intranet online training course. Comparative Medicine faculty and staff provide further training through lectures and/or staff meetings. Laboratory safety/chemical and personal hygiene (initial, after revisions, and every three years), respiratory protection and fit testing (annually), PPE (as needed, new hazard in area), ergonomics (orientation and as requested), noise (as needed/requested) are provided by EH&S via online or face-to-face training.

3) Personal Hygiene [*Guide*, p. 20; *Ag Guide* pp. 4-5]

a) List routine personal protective equipment and work clothing provided and/or required for animal care personnel, research and technical staff, farm employees, etc.

DCM provides surgical scrubs and safety shoes for animal care and veterinary technical staff. Lab coats are provided for veterinary and laboratory staff. PPE provided by DCM includes gloves, shoe covers, boots, head covers, protective sleeves, disposable gowns and coveralls, aprons, goggles, respirators and face shields. A respiratory protection program, including medical evaluation, training, and fit testing, is in place for those employees required to wear N95 respirators.

b) Describe arrangements for laundering work clothing.

Work clothing is laundered in-house using the laundry area maintained by DCM.

c) Describe provisions and expected practices for washing hands, showering, and changing clothes, including instances where work clothes may be worn outside the animal facility.

Locker rooms with showers and changing facilities are located in the animal facilities in both [redacted]. An additional locker room is located in the surgery area on the [redacted]. Sinks are located throughout all animal facilities for hand-washing. Employees are required to change when arriving and departing work, including lunch breaks. When employees travel to ECU facilities outside the animal facility, they must cover their scrubs with a lab coat or other appropriate garment.

d) Describe policies regarding eating, drinking, and smoking in animal facilities.

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Eating and drinking are prohibited in animal housing and use areas. Break rooms are available for eating and drinking. Private offices may also be used for this purpose. Smoking is only permitted outside buildings in designated areas.

4) Standard Personnel Protection [*Guide*, pp. 21-22]

a) Describe facility design features, equipment and procedures employed to reduce potential for physical injury inherent to animal facilities (e.g., noisy areas, large quantities of chemicals such as disinfectants, ergonomics) or species used (e.g., nonhuman primates, agricultural animals).

Employees are trained by animal facility management and EH&S in proper techniques for lifting, moving cages, and using equipment. Safety showers and eyewash stations are located throughout the facilities. EH&S conducts on-site evaluations of practices, equipment, chemical storage, and PPE, including hearing protection, and makes recommendations for improvement.

All personnel handling nonhuman primates are trained in safe handling processes. Proper PPE is worn when working in primate areas. Animals are moved within group cages and separated using removable panels; they are handled only when necessary.

b) Describe likely sources of allergens and facility design features, equipment, and procedures employed to reduce the potential for developing Laboratory Animal Allergies (LAA).

Allergens from animal species housed in the facility, particularly from rodents, can sensitize personnel and cause allergic reaction. To limit exposure to rodent allergens, practices including opening rodent cages and handling animals under a cage changing station or biosafety cabinet, appropriate PPE including gloves and gown when cages are open and when handling the animals, and using cage dumping stations for dirty bedding disposal are followed.

c) Describe likely sources of zoonoses and facility design features, equipment, and procedures employed to reduce potential exposure to zoonoses.

Although primates test negative for Herpes B virus, they are treated as positive and housed in negative pressure rooms in squeeze caging with shift panels. PPE worn when working with primates includes eye, skin and mucous membrane protection. Work with

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[redacted] is performed in a CDC-inspected [redacted] with negative room pressure and HEPA filtered exhaust, specialized containment equipment and PPE, and detailed procedures for handling animals and waste. ABSL 2 zoonotic disease agent work such as [redacted] and [redacted] is performed using BSL2 practices in negative pressure rooms. Specially designed cages are used for [redacted] tick feeding studies. These cages have wire bottoms and sit over a water pan to capture and drown ticks as they detach.

d) Describe the procedures for the maintenance of protective equipment and how its function is periodically assessed.

Staff are trained on the wear, care, inspection, maintenance, and replacement of all types of PPE. They are trained in proper use, storage, and replacement of N95 respirators and in PAPR maintenance when they are required to use these types of PPE. Charged PAPRs are flow tested before use. Lead aprons are radiographed annually to ensure integrity.

e) Respiratory Protection

i) Describe situations where respiratory protective equipment is available or required, such as cage washing facilities, feedmills, etc.

N95 respirators and PAPRs are available to anyone who wishes to use them for voluntary protection. In situations where Prospective Health and/or EH&S determine that respiratory protection is required (such as *Brucella* areas), personnel must comply with requirements of the respiratory protection program to include medical evaluation, training, and fit testing (if needed). If downdraft necropsy tables are not available, PAPRs or other approved protective devices are used when necropsying primates.

ii) Describe programs of medical clearance, fit-testing, and training in the proper use and maintenance of respirators.

EH&S, in conjunction with Prospective Health, is responsible for the administration of the respiratory protection program which includes medical clearance (conducted by Prospective Health), training on proper use, care and maintenance, and annual training and fit testing.

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iii) Describe how such respiratory protective equipment is selected and its function periodically assessed.

Respiratory protective equipment is selected based on hazard assessment by subject matter experts. Replacement and change-out schedules are developed based on exposure profile and the type of agent being protected against. The EH&S Industrial Hygiene Specialist evaluates program performance annually for conformance with applicable standards.

f) Heavy Equipment and Motorized Vehicles

i) Provide a general list of the types of cage-processing equipment used, such as rack/cage washers, tunnel washers, robotics, and bulk autoclaves. Describe training programs, informational signage, and other program policies designed to ensure personnel safety when working with such equipment.
Note: Details of specific equipment installed in animal facility(ies) are to be provided in **Appendix 15** (Facilities and Equipment for Sanitizing Materials).

DCM has 4 rack washers (2 in [redacted] and 2 in [redacted]). Personnel are trained in rack washer safety at hiring and annually thereafter. All rack washers are equipped with de-energizing cables to shut off hot water and explosion relief door latches to allow rapid egress; these are clearly identified. Instructional signage is posted on the outside of the washers.

ii) List other heavy equipment such as scrapers, tractors, and farm machinery (manufacturer name, model numbers, etc. are not necessary). Describe training programs, informational signage, and other program policies designed to ensure personnel safety when working with such equipment.
Note: If preferred, this information may be provided in a Table or additional Appendix.

N/A

iii) If motorized vehicles are used for animal transport, describe how the driver is protected from exposure to hazards such as allergens or zoonoses and decontamination methods employed. Also describe instances where vehicles may be shared between animal and passenger transport.

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The box truck used for animal transport has separate, climate-controlled animal and passenger spaces. The cargo vans are used to transport rodents and supplies between [redacted]. Rodents are transported in the vans in covered microisolator cages. Vehicles are sanitized between uses. The box truck is hosed and disinfected with a quatricide product. The vans are disinfected with either a quatricide or chlorine dioxide product.

g) Describe safety procedures for using medical gases and volatile anesthetics, including how waste anesthetic gases are scavenged.

Volatile anesthetics are typically delivered through a precision vaporizer and scavenged by a built-in vacuum line, charcoal canister, or fume hood/exhaust system. Vaporizers are serviced and certified on an annual basis. Open drop systems are also used, generally under a fume hood or with another scavenging system. For procedures involving the use of passive scavenging system, EH&S works closely with departments to ensure waste anesthetic gases are properly scavenged. EH&S conducts personal and area monitoring to characterize employee's exposure, and recommends controls, as necessary, to ensure operations are within the applicable recommended limits.

iii. Animal Experimentation Involving Hazards [*Guide*, pp. 20-21]

1) List, according to each of the categories noted below, hazardous or potentially hazardous agents currently approved to be used in animals that are or will be maintained for more than a few hours following exposure. If the hazardous agent cannot be listed by name for security/proprietary reasons, identify it by the general category of agent and level of hazard. *Note:* If preferred, this information may be provided in a Table or additional Appendix.

a) Biological agents, *noting hazard level* (CDC Biohazard Level, Directive 93/88 EEC, CDC or USDA/DHHS Select Agent, etc.). Examples may include bacteria, viruses, viral vectors, parasites, human-origin tissues, etc.

ABSL1:
Adeno-associated viral vector, house dust mite, recombinant DNA, rabies virus glycoprotein, lipopolysaccharide, recombinant protein

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ABSL2:
Bacteria: [redacted]
Viruses: orthopoxvirus (vaccinia and cowpox), influenza PR8 (H1N1)
Human-origin tissues and cell lines
Viral vectors: replication deficient lentiviral vector, replication deficient retroviral vector, replication deficient adenoviral vector
***Toxins*:** pertussis toxin, diphtheria toxin, complete Freund's adjuvant (heat killed *Mycobacterium tuberculosis*)

ABSL3:
Bacteria: [redacted]

b) Chemical agents, *noting general category* of hazard (toxicant, toxin, irritant, carcinogen, etc.). Examples may include streptozotocin, BrdU, anti-neoplastic drugs, formalin, etc.

TOXICANT: 5-bromo-2'-deoxyuridine, 5-ethynyl-2'-deoxyuridine, methotrexate, triclosan, DEET, streptozotocin, tamoxifen, clozapine-n-oxide, lead acetate, perfluorooctane sulfonate; sodium orthovanadate, phosphatidylethanol, WIN 18,446, chlorpyrifos, cisplatin, 5-fluorouracil (5-FU), vinclozolin, 7-B estradiol, estrogen, testosterone, progesterone, 17a, 20b-dihydroxy-4-pregnen-3-one, diisoproprylfluorophosphate, SR141716A, WIN55212-2, delta 9 tetrohydrocannabinol, cocaine, maraviroc, bisphenol A diglycidyl ether, paclitaxel, amphetamine, nicotine bitartrate, rapamycin inhibitor, quisqualic acid, chloral hydrate, fenofibrate, norethisterone, urethane, rotigotine, tribromoethanol, carbon tetrachloride, clozapine-N-oxide

TOXIN: cardiotoxin (*Naja nigricollis* toxin)

IRRITANT: talarozole, resveratrol, vinclozolin, sulforaphane, D-carnosine, D-luciferin, rosiglitazone, MS-222, methacholine, bendavia, aqueous film forming foam, phosphatidic acid, multi-walled carbon nanotubes, silver nanotubes, JZL-184, z-DEVD-fmk, RHS 80267, tetrahydrolipstatin, thioglycollate, sulforaphane, gluthathione monoethyl ester, N-acetylcysteine, L-buthionine-[S,R]-sulfoximine, berberine, trimethylphenylphosphonim, decyltriphenylphosphonim, sGC stimulators, protein kinase inhibitors, huanylate cyclase inhibitors, cyclic nucleotide analogues, PDE inhibitor, dopamine specific agents, inhibitor of nitric oxide (NO) generation, substrate for NO generation, inhibitor of NAPDH oxidase, Kuwait ambient particulate matter, acetylcholine chloride, anandamide, tocrisolve, apigenin, minocycline hydrochloride, aluminum hydroxide adjuvant, dopamine receptor

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agonist/antagonist, fluoxetine, alpha- galactosylceramide, triiodothyronine

CARCINOGEN: azoxymethane, 5-ethynyl-2-deoxyuridine, rapamycin

POTENTIALLY HAZARDOUS: novel compounds with potential for treating various diseases or conditions, such as Rho inhibitors, GPR4-inhibitor, cannabinoid derivatives.

c) Physical agents (radiation, UV light, magnetic fields, lasers, noise, etc.).

3-[^{3}H]D-glucose, UV light, X-ray, ozone, nitrogen

2) Experiment-Related Hazard Use [*Guide*, pp. 18-19; See also Chapters 2 and 3 in *Occupational Health and Safety in the Care and Use of Research Animals*, NRC 1997].
Note: Written policies and standard operating procedures (SOPs) governing experimentation with hazardous biological, chemical, and physical agents should be available during the site visit.

a) Describe the process used to identify and evaluate experimental hazards. Describe or identify the institutional entity(ies) responsible for ensuring appropriate safety review prior to study initiation.

Use of hazards in experiments must be approved by the appropriate committee/subject matter expert (IBC, EH&S, radiation safety). Additionally, experimental hazards used in animals must be approved by the IACUC (and subject matter experts also serve on the IACUC). IACUC approval is not granted until other approvals are complete.

b) Describe how risks of these hazards are assessed and how procedures are developed to manage the risks. Identify the institutional entity(ies) responsible for reviewing and implementing appropriate safety or containment procedures.

Applications to the IBC are reviewed, appropriate risk level determined, and appropriate procedures developed for handling infectious agents, vectors, toxins, and human biologicals used in animals. EH&S requires laboratory safety plans for each animal use protocol, which include chemical classifications, equipment, chemical hazards, ventilation requirements, decontamination requirements, storage and handling, and disposal. The IACUC requires relevant information on handling animals exposed to hazards to be included in Appendix 1 of the AUP form. This form is posted on the animal room

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door when hazardous agents are in use. Appropriate biohazard signage is also posted where applicable.

c) Describe the handling, storage, method and frequency of disposal, and final disposal location for hazardous wastes, including infectious, toxic, radioactive carcasses, bedding, cages, medical sharps, and glass.

Hazardous wastes are segregated by type (biological, chemical, radiation, infectious, sharps). Hazardous chemical waste is collected and stored in individual lab satellite accumulation areas.
The environmental waste technician collects chemical waste containers and the office of Prospective Health waste technician collects biohazardous waste containers. Waste containers are transported to designated campus hazardous waste sites (East and HSC) until pick up from the hazardous waste vendor for off-site disposal or incineration. Hazardous agent forms and lab safety plans identify animal bedding/carcass disposal and cage decontamination procedures. Radioactive carcasses and waste are collected in biohazard bags properly labeled (radioactive sticker) and held for pickup by the radiation safety officer.

d) Describe aspects of the medical evaluation and preventive health program specifically for personnel potentially exposed to hazardous agents.

Individuals working with vaccinia virus must be vaccinated. Individuals working with [redacted] Individuals working with ionizing radiation are badged and monitored on a regular basis. Individuals working with potential blood borne pathogens receive annual training and are offered Hepatitis B immunization. Radiation Safety monitors radioactivity in animal rooms when radioactive isotopes are used; in labs, both the investigator and Radiation Safety monitor radioactivity.

3) Hazardous Agent Training for Personnel [*Guide*, p. 20]
Describe special qualifications and training of staff involved with the use of hazardous agents in animals.

Personnel working with animals exposed to [redacted] receive select agent training annually and must be cleared to enter the [redacted].
Laboratory personnel and animal care staff receive lab safety/chemical hygiene training from EH&S. Supervisors will supply laboratory specific training based on protocols performed, which detail proper safety procedures prior to handling hazardous agents. Signage is posted on the

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animals rooms containing hazards and describes precautions to be taken while in the animal room, as well as emergency contact information

4) Facilities, Equipment and Monitoring [*Guide*, pp. 19-20]

a) Describe locations, rooms, or facilities used to house animals exposed to hazardous agents. Identify each facility according to the hazard(s) and containment levels (if appropriate*).*
Note: If preferred, information may be provided in a Table or additional Appendix.

There are three suites used for containment of hazardous agents. [redacted]. [redacted] is an [redacted] suite for [redacted] research and animal housing. [redacted] houses animals and procedure area for orthopoxvirus work (ABSL 2). Both suites have an anteroom, animal housing cubicles, and procedure areas. Hard ducted biosafety cabinets are in each area, and the suites are negative pressure relative to the hallway. Pass-through autoclaves are present and used to autoclave out contaminated carcasses, caging and waste. In [redacted] is a containment suite that is used for various ABSL2 agents and also for rodent pathogen containment (murine influenza). It has an anteroom, two separate rooms with procedure areas and animal housing cubicles. Hard-ducted biosafety cabinets are present in each room. A pass-through autoclave is available to autoclave out contaminated carcasses, caging, and waste. [redacted] is negative pressure relative to the hallway.

b) Describe circumstances and conditions where animals are housed in rooms outside of dedicated containment facilities (i.e., in standard animal holding rooms). Include practices and procedures used to ensure hazard containment.

ABSL2 studies can be conducted in conventional animal rooms. Airflow is negative relative to the hallway, animals are housed in static microisolator cages, and all animal handling is done in biosafety cabinets. Appropriate PPE is donned prior to room entry and removed prior to exiting the room. Dirty cages and bedding, carcasses, waste, and investigator supplies are decontaminated prior to removal from rooms. All rooms housing animals exposed to hazardous agents are prominently labeled with hazard information posted on the animal room doors.

c) Describe special equipment related to hazard containment; include methods, frequency, and entity(ies) responsible for assessing proper

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function of such equipment.

The [redacted] has specialized hazard containment equipment including:

[redacted] Housing Unit-annual flow testing/certification by biosafety officers.

[redacted] J4 Biosafe refrigerated, floor model high-speed centrifuge with rotors designed to contain leakage, negative pressure, HEPA filtered airflow into centrifuge – laboratory personnel and biosafety officers responsible for ensuring proper equipment function. Lab personnel check during every use, biosafety officers during safety inspections.

Purified air personal respirators (PAPRs) – worn by laboratory personnel during work with live [redacted] strains or mice infected with these strains – laboratory personnel responsible for ensuring proper equipment function at every use.

Enclosed shaker incubators - laboratory personnel responsible for ensuring proper equipment function during every use.

Omnimixer tissue homogenizer with sealed cups - laboratory personnel responsible for ensuring proper equipment function during every use.

Multiple biosafety cabinets are located throughout the facilities for handling animals exposed to ABSL2 agents. Biosafety officers schedule annual testing and recertification by an outside contractor. Chemical fume hoods are available and used when working with chemical hazards and animals exposed to these hazards. EH&S personnel perform annual testing of fume hoods. Lead shielding and lead-lined PPE protect personnel working with x- rays. Lead aprons and gloves are x-rayed annually to ensure integrity.

d) Describe the husbandry practices in place to ensure personnel safety, including any additional personnel protective equipment used when work assignment involves hazardous agents.

Containment procedures involve restricted access to the animal rooms, use of microisolator caging, provision of biosafety cabinets and fume hoods for animal and hazard handling, clearly defined procedures, provision of PPE appropriate for the hazard, negative room pressure, and procedures for handling contaminated waste.

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e) Incidental Animal Contact and Patient Areas

i) List and describe facilities that may be used for both animal- and human-based research or patient areas, including the policies and procedures for human patient protection, facility decontamination, animal transport through common corridors or elevators, and other personnel protection procedures.

Non-human primates may be transported to the [redacted] in the [redacted]. Animals will only be moved and scanned when the [redacted] is closed in the evenings. They will be anesthetized and transported in covered, locked primate transport cages by veterinary and research staff. Animals will not come into direct contact with instrument surfaces; absorbent, impervious pads will be placed under the animals. Once scans are complete, animals will be returned to their home cages and all surfaces will be decontaminated with appropriate disinfectants per DCM and IACUC approved SOPs.

ii) Describe any *other* circumstances in which animals or caging equipment are transported in common use corridors or elevators (e.g., have the potential to come in contact with individuals not associated with the animal care and use program), and measures taken to mitigate risks associated with such use.

Rodents and birds moved between facilities and from facilities to laboratories are housed in cages covered by drapes. Rodents transported outside from [redacted] to [redacted] are placed in microisolator cages inside a closed transport cart, or in transport containers provided by DCM. Rodents transported to [redacted] are in covered containers provided by DCM. Pigs are transported from [redacted] to [redacted] in a stainless-steel transport cart inside the box truck. Other than trips to the [redacted], all primate work is done within the [redacted] facility.

B. Program Oversight

1. The Role of the IACUC/OB [*Guide*, pp. 24-40]

a. IACUC/OB Composition and Function [*Guide*, pp. 17; 24-25]
Please provide a Committee roster, indicating names, degrees, membership role, and affiliation (e.g., Department/Division) as **Appendix 7**.

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i. Describe Committee membership appointment procedures.

Committee members are appointed in writing by the IO. The IO has been delegated this authority in writing by the ECU Chancellor (the CEO).

ii. Describe frequency of Committee meetings. Note that **Appendix 8** should contain the last two IACUC/OB meeting minutes.

The IACUC typically meets monthly.

iii. Describe the orientation, training, and continuing education opportunities for IACUC/OB members. [*Guide*, p. 17]

New IACUC members meet with the AV and IACUC Chair for orientation after they are appointed. During this training, they are given guidance on where to find resources including the PHS Policy, USDA Animal Welfare Regulations and Policies, and the *Guide* (USDA, OLAW, and AAALAC websites), and are instructed in IACUC procedures and responsibilities. They must take the online training course on humane animal care and use, federal regulations and policies, and University policies. This training is repeated at three-year intervals. New members attend several meetings to learn IACUC procedures prior to being assigned as primary reviewer of an AUP.

A power point presentation on how to conduct semi-annual facility inspections is provided for all IACUC members. Additional training includes access to IACUC website information and other power point presentations, retreats, webinars, supplemental training handout materials, and support to attend regional and national IACUC-focused meetings.

b. Protocol Review [*Guide*, pp. 25-27]
A blank copy of your institution's protocol review form should be provided as **Appendix 9**. Also include forms used for annual renewal, modifications, amendments, etc., as applicable.

i. Describe the process for reviewing and approving animal use. Include descriptions of how:

- the IACUC/OB weighs the potential adverse effects of the study against the potential benefits that may result from the use ("harm-benefit analysis"),
- protocols that have the potential to cause pain or distress to animals are reviewed and alternative methodologies reviewed,
- veterinary input is provided, and
- the use of animals and experimental group sizes are justified.

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Note: Make sure you address each of the items above.

The IACUC director electronically receives and processes Animal Use Protocols (AUPs). Most AUPs receive a veterinary pre-review. The PI has the opportunity to make revisions based on the pre-review comments; revised AUPs are then sent to the full committee.

All AUP submissions are reviewed by either full committee or designated member review. For full committee review, a primary and a veterinary reviewer are appointed by the chair for each AUP. Protocols are presented by the reviewers at a convened meeting of a quorum of the IACUC. Each protocol is discussed by the primary and veterinary reviewer, and then discussion is opened to all IACUC members. At the conclusion of the discussion period, the IACUC chair summarizes items that were discussed. The IACUC votes for: approval; require modifications (to secure approval); or, withhold approval. A majority vote of the quorum present decides the outcome. Following the meeting, investigators are informed in writing from the chair regarding the outcome. When modifications are required to secure approval, the modifications are submitted and reviewed by a designated reviewer (this is the default option as approved unanimously in writing by the entire IACUC). All IACUC members agree in advance in writing that the quorum of members present at a convened meeting may decide unanimously to use designated member review subsequent to full committee review when modifications are required to secure approval. However, any member of the IACUC may, at any time, request to see the revised protocol and/or request full committee review of the protocol. This process is followed unless it is determined otherwise (i.e. full committee re-review) and approved at the meeting by a majority of the quorum present. Investigators may not begin animal work until approval is granted. The decision of the IACUC is final; the IO or other institutional officials may not approve an activity involving the care and use of animals if it has not been approved by the IACUC, nor can the IACUC's decision be overturned.

In legitimate circumstances that require review prior to the next convened meeting, such as an NIH Just-In-Time (JIT) review, investigators may request that a protocol be reviewed by the designated member review process. Protocols identified for designated review are first pre-reviewed by a subcommittee consisting of one committee member and one veterinarian. The AUP, with the pre-reviewers' comments, is forwarded to the entire committee. If any member requests full committee review, the AUP is added to the agenda of the next convened meeting. If no one requests full committee review within two business days, designated reviewer(s), appointed by the chair, receive and review identical versions of the AUP under consideration; this includes any comments generated from the pre-review process. The designated member review process can result in the following: approval, require modifications (to secure approval), or request full committee review. If two or more individuals participate as designated

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member reviewers, they must be unanimous in any decision. The designated reviewer(s) forward(s) written notification of the decision to the IACUC director. The designated member review decision is considered final. Following the designated member review process, the investigator receives written notification from the IACUC chair regarding the outcome of the review. When full committee review is requested, approval may be granted only after review at a convened meeting of a quorum of the IACUC and with the approval vote of a majority of the quorum present. Committee members who have a real or perceived conflict of interest in the review or approval of a research project or protocol do not participate in either review or approval. At a convened meeting, the member is recused during the discussion and voting process; this member does not contribute to the quorum when recused. For the designated member review process, the member does not receive the pre-review subcommittee comments and request by the IACUC chair.

Grant proposals and contracts are compared by an IACUC member to the supporting AUP to ensure that the vertebrate animal use within the research project is consistent with the AUP and conforms to PHS Policy, the *Guide*, and the Animal Welfare Act (if applicable).

The protocol review form utilized by IACUC members serving as primary or designated reviewers contains a question specifically requesting the reviewer to weigh the harm done to the animal against the benefit of the proposed study. This topic is also discussed during IACUC deliberations.

PIs are required to consider alternatives to any procedures that have the potential to cause pain and distress when they write the AUP, indicate if alternatives are available, and explain why alternatives are not used if they are available. Results of database searches and sources consulted are included in the AUP, as well as consideration of the three Rs.

Veterinarians frequently consult with PIs during AUP preparation and recommend refinement strategies at that time; they are also involved in pre-review and during AUP review and discussions.

If the IACUC has any concerns about AUPs involving potential pain and distress, it can approve a pilot study and review the results before approving the remainder of the animals requested on the AUP. The IACUC can assign “Watchdog” status to a study, which alerts animal care and veterinary personnel to closely observe condition of the animals. The committee can also require that a veterinarian or IACUC member evaluate the procedure and report back to the IACUC.

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The PI must provide a scientific rationale for choice of species and numbers of animals requested in the AUP. Where relevant, statistical justification should be provided.

ii. Describe the process for reviewing and approving amendments, modifications, and revised protocols. If applicable, include a description/definition of "major" vs. "minor" amendments.
Note: If preferred, this information may be provided in a Table or additional Appendix.

Minor (administrative) amendments are concerned with "bookkeeping", and generally do not involve any changes in animal treatment. Some common examples are deletion of or addition of qualified personnel involved in the project (other than the PI), change in contact information or room in which the experiments are conducted, addition of another strain of the same animal species, change in sex of animal to be used, decrease in number of sample collection time points or sample volumes, and a ≤ 10% increase in animal numbers (for studies involving 20 animals or less, up to 4 extra animals).

Administrative amendments are reviewed by the chair of the IACUC and/or designee for approval. There is no limit to the number of amendments that can be submitted for an AUP.

Significant amendments are reviewed in the same manner as new Animal Use Protocols, either by full committee or designated member review.

Significant amendments involve experimental changes that directly impact animal use and are reviewed by full committee review or designated member review, as appropriate. This may be a change in study objectives, switching from non-survival to survival surgery, an increase in degree of invasiveness of a procedure or discomfort to an animal, or a >10% increase in the number of animals used (for studies involving 20 animals or less, more than 4 extra animals). Other changes deemed significant include a change in PI, in species, in housing, use of animals in a location not part of the animal program overseen by the IACUC, and changes in procedures that impact personnel safety.

Veterinary verification and consultation (VVC) are specific significant changes that may be handled administratively in accordance with ECU IACUC reviewed and approved policies, by an ECU IACUC-authorized veterinarian who is acting as subject-matter expert. These include a change in euthanasia methods to any method approved in the *AVMA Guidelines for the Euthanasia of Animals*, or a change in analgesia, sedation or anesthetic agent(s) in accordance with the DCM Anesthesia and Analgesia Guidelines. Changes in blood collection site, volume, and frequency must be consistent with ECU IACUC approved Blood Collection Guidelines. VVC

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can be used for changes in duration, frequency, or number of procedures performed on an animal if the changes are consistent with ECU IACUC-approved policies (e.g. rodent tail snip policy, guidelines for substance administration, policy for the use of Freund's adjuvant) or changes in medications and substances consistent with ECU IACUC-approved formularies. The veterinarian may refer any request to the IACUC for review for any reason and must refer any request that does not meet the parameters of the IACUC reviewed and approved policies.

If multiple significant amendments result in an AUP that is difficult to understand/track or significantly deviates from original project goals, the IACUC may request submission of a new AUP.

c. Special Considerations for IACUC/OB Review [*Guide*, pp. 5; 27-33]

i. Experimental and Humane Endpoints [*Guide*, pp. 27-28]

1) Describe the IACUC/OB's review of "humane endpoints," i.e., alternatives to experimental endpoints to prevent or in response to unrelieved animal pain and distress.

The AUP form asks for humane endpoints for all procedures described that involve potential for pain or distress. The IACUC review form also asks the reviewer to specifically consider humane endpoints. The committee carefully reviews and discusses proposed endpoints, emphasizing the balance between achieving scientific goals and preventing unnecessary pain and distress. IACUC policies are developed and approved for specific endpoints dealing with tumor production, polyclonal antibody production, and experimental allergic encephalomyelitis (EAE).

2) For studies in which humane alternative endpoints are not available, describe the IACUC/OB's consideration of animal monitoring and other means used to minimize pain and distress (e.g., pilot studies, special monitoring, other alternatives).

Watchdog designation may be applied to studies of particular concern to the IACUC including studies without humane alternative endpoints. The IACUC may also approve pilot studies involving unfamiliar procedures with potential for pain or distress or require monitoring by veterinary staff or committee members.

3) Identify personnel responsible for monitoring animals for potential pain and distress and describe any mechanisms in place to ensure that the

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personnel have received appropriate species- and study-specific training.

Research team members must be familiar with the approved AUP, including expected and possible experimental effects and methods to mitigate potential pain and distress. DCM surgery training includes instruction on recognition of signs of pain and distress in animals. Animal care staff observe all animals at least daily and report any atypical or painful behaviors to veterinary staff for follow-up.

ii. Unexpected Outcomes that Affect Animal Well-being [*Guide*, pp. 28-29]
Describe how unexpected outcomes of experimental procedures (e.g., unexpected morbidity or mortality, unanticipated phenotypes in genetically-modified animals) are identified, interpreted, and reported to the IACUC/OB.

Animal care staff and veterinary staff identify unanticipated adverse outcomes in animals and work with investigators to correct any problems. This information is reported back to the IACUC, typically during monthly meetings (or right away if the situation requires immediate IACUC attention). Investigators are asked specifically about unexpected outcomes in AUP annual reviews.

iii. Physical Restraint [*Guide*, pp. 29-30]
Note: This section is to include only those protocols that require prolonged restraint. Brief restraint for the purpose of performing routine clinical or experimental procedures need not be described.

1) Briefly describe the policies for the use of physical restraint procedures or devices. Include, if applicable, the IACUC/OB definition of "prolonged."

The AUP form describes prolonged restraint as restraint beyond what is needed for routine care and use procedures for rodent and rabbit restrainers, and large animal stocks. Prolonged restraint also includes *any* use of primate chairs, slings, tethers, metabolic crates, nose-only inhalation chambers, and radiation exposure restraint devices.
The PI must describe and justify any prolonged restraint in the AUP, and must include how animals are acclimated, duration of restraint, methods to ensure comfort and well-being, and endpoints for removal. The IACUC approves restraint on a case-by-case basis.

2) Describe animal restraint devices that are used or have been used within the last three years. For each device, briefly describe
- the duration of confinement
- acclimation procedures
- monitoring procedures
- criteria for removing animals that do not adapt or acclimate, and

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- provision of veterinary care for animals with adverse clinical consequences.

Note: If preferred, this information may be provided in a Table or additional Appendix.

[redacted] They are continually monitored (blood flow and heart rate) and are removed and euthanized if blood flow decreases.

[redacted] Animals are monitored continually. Mice are acclimated to the device for 2-3 days prior to taking blood pressure readings. Animals that do not tolerate restraint will be removed from the device and the study.

[redacted]. They are monitored continuously throughout the procedure for struggling, vocalizations, and signs of distress. If mice do not acclimate to the device, they will be removed.

[redacted]. Animals are observed via webcams. If animals exhibit signs of distress they will be evaluated and may be removed from the study.

[redacted]. A piece of dry food is placed in the tube to provide additional comfort. No signs of discomfort have been observed in the last 8 years; if any are seen the mice will be removed.

In the above situations, veterinary intervention was not required (but was available if needed).

[redacted]

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[redacted].

iv. Multiple Survival Surgical Procedures [*Guide*, p. 30]

Note: One survival surgical procedure followed by a non-survival procedure is not included in this category.

1) Describe the IACUC/OB's expectations regarding multiple survival surgery (major or minor) on a single animal.

Multiple survival surgeries, whether major or minor, must be scientifically justified and approved by the IACUC. They are considered on a case-by-case basis and must conform to IACUC policy. The IACUC policy on multiple survival surgeries is available on the IACUC website.
The IACUC considers the following when multiple survival surgeries are proposed in an AUP:
Are the surgeries related components of a single research project or protocol?
Are scarce animal resources being conserved?
Are the surgeries needed for clinical reasons?
What is the potential for pain and distress associated with each procedure?
Are there permanent alterations in anatomy or physiology that will impact animal health and well-being?
Is the post-procedural care appropriate for each surgery and for the cumulative effects of the surgeries?
Are multiple surgeries the only method for achieving the scientific goals of the study?

2) Summarize the types of protocols currently approved that involve multiple major survival surgical procedures

Note: If preferred, this information may be provided in a Table or additional Appendix.

[redacted] In each case, all surgeries are essential to achieving the respective study's goals.

A fourth study involves the testing of an [redacted]. An [redacted] is performed followed by

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the [redacted].

A fifth study is approved for [redacted]. The separate surgeries are required [redacted].

A sixth study involves the [redacted].

v. **Food and Fluid Regulation** [*Guide*, pp. 30-31]. *Note:* This does not include pre-surgical fast.

Summarize the types of protocols that require food and/or fluid regulation or restriction, including:

- justification
- species involved
- length and type of food/fluid regulation
- animal health monitoring procedures and frequency (e.g., body weight, blood urea nitrogen, urine/fecal output, food/fluid consumption)
- methods of ensuring adequate nutrition and hydration during the regulated period

Note: If preferred, this information may be provided in a Table or additional Appendix.

[redacted]

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[redacted]

[redacted] Animals are observed for normal behavior during this period, if signs of distress are noted they are removed from the study.

[redacted]

[redacted] If any signs of distress are noted, animals are removed from the study.

vi. Use of Non-Pharmaceutical-Grade Drugs and Other Substances [*Guide*, p. 31]

Describe the IACUC/OB's expectations regarding the justification for using non-pharmaceutical-grade drugs or other substances, if applicable.

The IACUC has a policy on use of non-pharmaceutical grade substances, posted on the IACUC website. Use of pharmaceutical grade compounds is the default; use of non-pharmaceutical grade compounds must be scientifically justified and details provided regarding sterility, stability, pH, pyrogenicity, etc., to address potential animal welfare concerns associated with use of such compounds.

vii. Field Investigations [*Guide*, p. 32]

Describe any additional considerations used by the IACUC/OB when reviewing field investigations of animals (non-domesticated vertebrate species), if applicable.

Several sections of the AUP form are relevant to field studies. Specific information must be provided on training, permits, capture, restraint, handling, marking, anesthesia, surgery, and euthanasia, as applicable. Information on incidental hazards is also requested. The IACUC reviews field research proposals with the same level of intensity as on-site AUPs.

viii. Animal Reuse [*Guide*, p. 5]

1) Describe institutional policies regarding, and oversight of, animal reuse (i.e., on multiple teaching or research protocols).

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There are very few teaching or research AUPs that involve animal reuse, therefore, animal reuse is evaluated by the IACUC on a case-by-case basis.

2) Briefly describe the types of activities currently approved that involve the reuse of individual animals.
Note: A list of specific protocols involving reuse of animals should be available during the site visit.

[redacted] Animal health is closely monitored through physical exams and diagnostic testing prior to re-assignment to a new study. Each animal has extensive individual research records, including laboratory results and health assessments.

Rats and mice that are used in the sentinel program (surplus animals) and animal handling training protocol may be transferred to the surgery training protocol (terminal).

3) Describe other instances where the final disposition of animals following study does not involve euthanasia, including adoption, re-homing, rehabilitation, etc.
Note: A list of specific protocols involving reuse of animals should be available during the site visit.

DCM has a process for adopting retired research animals. Consideration is given to species, animal health and procedures that the animal has undergone. Individuals adopting animals are typically affiliated with the animal care and use program.

Betta fish are adopted by students with a care guide following undergraduate teaching labs.

2. Post-Approval Monitoring [*Guide*, pp. 33-34]

a. Describe mechanisms for IACUC/OB review of ongoing studies and periodic proposal/protocol reviews (e.g., annual, biennial, triennial, or other frequency).

Annual reviews are required for all approved AUPs. The investigator submits an annual review form to the IACUC director. Annual review is conducted during a convened meeting and with the approval vote of the majority of the quorum present. The form requests a project update. Any requested changes are subject to the same processes as that for amendment approval.

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Protocols are approved for 3 years; administrative extensions are not permitted. A *de novo* submission of the AUP is required every 3 years. The IACUC director tracks AUP expiration dates and contacts the investigator 3-4 months prior to the AUP's expiration date. At least 3 notices are sent to the investigator; for noncompliant investigators, both the IACUC Chair and the investigator's department chair are included on the third notification sent. In the event that the AUP expires, the animals are placed on the DCM holding protocol and the PI does not have access to them until a replacement AUP is approved.

b. Describe the process and frequency with which the IACUC/OB reviews the program of animal care and use.

A subcommittee of at least two IACUC members is appointed by the IACUC chair every six months to evaluate the institution's program for humane care and use of animals, using the *Guide* as the basis for the evaluation. The previous semiannual program review, the outline provided by AAALAC, International's program description, and the OLAW checklist are used as references in the evaluation process. The subcommittee prepares a written report of its findings and recommendations, which is presented to the Committee at the next convened meeting for consideration, discussion, and approval.

c. Describe the process and frequency with which the IACUC/OB conducts facility and laboratory inspections.

- Describe the rationale or criteria used for exempting or varying the frequency of reviewing satellite holding facilities and/or animal use areas.
- If contract facilities or contractor-provided personnel are used, describe procedures used by the IACUC/OB to review such programs and facilities.

Note: A copy of the last report of these reviews should be included as **Appendix 10**.

Subcommittees consisting of at least two IACUC members are appointed by the IACUC chair every six months to inspect all of the institution's animal care and use facilities, satellite housing areas, and laboratories, using the *Guide*, the OLAW checklists, and the previous semiannual inspection findings as the basis for evaluation. These subcommittees identify minor and significant deficiencies and, using the OLAW review and inspection report form, prepare reports of findings and recommendations, which are presented to the full Committee at the next convened meeting for consideration, discussion, and approval. Inspection results are reported in writing to the responsible party for that area, noting any deficiencies, along with a specific plan and schedule for correction. The responsible party then makes the correction(s) and confirms in writing to the IACUC director that correction(s) is/are complete. During the subsequent semiannual inspection, a subcommittee team verifies the

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corrections. If verification is needed prior to the next semiannual inspection, veterinary staff, IACUC members, or other designees can provide verification. All IACUC members are assigned to participate in semiannual facility inspections; members may go on as many facility inspections as they choose.

d. If applicable, summarize deficiencies noted during external regulatory inspections within the past three years (e.g., funding agencies, government, or other regulatory agencies) and describe institutional responses to those deficiencies. *Note:* Copies of all such inspection reports (if available) should be available for review by the site visitors.

No non-compliant items were identified by USDA in the last 3 years.

e. Describe any other monitoring mechanisms or procedures used to facilitate ongoing protocol assessment and compliance, if applicable.

Copies of all approved AUPs are available to DCM faculty and staff [redacted]. Animal care and veterinary staff monitor research activities and animal well-being during the course of their daily work. Any questions that arise are directed to the AV and/or IACUC Chair for further investigation and resolution.

3. Investigating and Reporting Animal Welfare Concerns [*Guide*, pp. 23-24]
Describe institutional methods for reporting and investigating animal welfare concerns.

Instructions for reporting animal welfare concerns through multiple channels are posted in facilities, animal use areas, on the IACUC website, and are part of mandatory animal user training. There are no reprisals against individuals reporting concerns. Concerns can be reported anonymously through the director or to any IACUC member. Once a concern is reported, the IACUC chair gathers information and presents the concern to the full committee. The committee evaluates the concern and decides by a majority vote what corrective action to take or if additional investigation is warranted. If further investigation is warranted, the chair appoints a subcommittee of at least two voting members to investigate the concern. The IO is verbally informed and/or notified in writing that an investigation is in progress. The subcommittee reports its findings at a convened IACUC meeting. Following discussion, recommendations and corrective actions are voted upon. Findings of the subcommittee and IACUC decisions are reported in writing to the principal investigator, the investigator's department chair, and the IO. If the concern involves an animal welfare violation, the IO sends a written report to OLAW in accordance with the PHS Assurance, AAALAC, and if applicable, to the USDA.

4. Disaster Planning and Emergency Preparedness [*Guide* p. 35]

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Briefly describe the plan for responding to a disaster potentially impacting the animal care and use program:

- Identify those institutional components and personnel which would participate in the response.
- Briefly describe provisions for addressing animal needs and minimizing impact to animal welfare.

Note: A copy of disaster plan(s) impacting the animal care and use program must be available for review by the site visitors.

DCM has a disaster plan which addresses various situations including hurricanes, tornados, blizzards, fire, bomb threats, and break-ins. DCM essential personnel are identified and alerted when situations are imminent. Staff prepare by stocking water, food, and other supplies sufficient for the anticipated duration of the event. Provision is made to relocate animals more at risk and euthanize them if ultimately necessary. Preparation and response are coordinated with other ECU groups such as facilities personnel and police. The disaster plan is reviewed annually with animal care personnel and updated as necessary. In September 2018 and September 2019, the plan was successfully implemented to deal with the effects of Hurricanes Florence and Dorian.

II. Animal Environment, Housing and Management

Note: Complete each section including, where applicable, procedures performed in farm settings, field studies, aquatic environments, etc.

A. Animal Environment

Note: Facility-specific details regarding mechanical system construction and operation is requested in Section IV.B.5. and **Appendix 11**; current (measured ***within the last 12 months***), detailed (by room) performance data must also be provided as indicated in **Appendix 11.**

1. Temperature and Humidity [*Guide*, pp. 43-45]

a. Describe the methods and frequencies of assessing, monitoring, and documenting that animal room or housing area temperature and humidity is appropriate for each species.
Note: If preferred, this information may be provided in a Table or additional Appendix.

[redacted]
Temperature ranges are determined based on *Guide* recommendations. Temperatures are measured continuously by the electronic thermostats in each

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animal room and are monitored by the Building Automation System (BAS). If the temperatures measured are outside the control limits, an alarm is triggered, and the appropriate Facilities shop is contacted to investigate. Additionally, high and low temperature readings and relative humidity are recorded on the room temperature log once a day by the animal technician, using a high-low memory thermometer. The zebrafish rack in [redacted] has an automated monitoring system that alerts research and DCM personnel if temperature or other critical parameters are out of range.

[redacted]
Temperature ranges are determined based on *Guide* recommendations. Temperatures are measured continuously by the electronic thermostats in animal rooms [redacted] by the Building Automation System (BAS). If the temperatures measured are outside the control limits, an alarm is triggered, and the appropriate Facilities shop is contacted to investigate. Zebrafish racks in [redacted] have automated monitoring systems that log parameters automatically into the computer at 5 minutes intervals and alert research personnel if temperature or other critical parameters are out of set ranges.

[redacted]
The [redacted] facility temperatures are verified daily by the PI or research staff as well as there is a separate remote monitoring and notification system by SENSAPHONE that is utilized by the research staff. When temperature ranges are outside of the control limits the research staff receive an alarm notification through e-mail, text messaging, or a voice phone call.
The [redacted] naked goby lab maintains fish in [redacted] This lab space is equipped with a digital thermometer. When fish are being housed in the lab, this device is checked daily and any abnormalities noted in the log.
The poison dart frog satellite room in [redacted] has a high-low thermometer; temperature is recorded daily.
[redacted] animal holding areas are outdoor and subject to ambient temperatures.

b. List, by species, set-points and daily fluctuations considered acceptable for animal holding room temperature and relative humidity.
Note: If preferred, this information may be provided in a Table or additional Appendix. [*Guide*, pp. 44 and 139-140]

Species	Temperature	Humidity
Rodents	73 (70-77) °F	30-70%
Finches	76 (73-80) °F	30-70%
Macaques	73 (70-77) °F	30-70%
Rabbits	66 (61-72) °F	30-70%
Pigs	73 (70-77) °F	30-70%

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Uploaded to Animal Research Laboratory Overview (ARLO) on 08/26/2021

Dart Frogs	73 (68-78) °F	50-80%
Zebrafish	80 (77-85) °F	30-70%
Sticklebacks	55 (50-60) °F	30-70%

c. Temperature set-points in animal housing rooms and/or environmental conditions are often outside of the species-specific thermoneutral zone. Describe the process for enabling behavioral thermoregulation (e.g., nesting material, shelter, etc.) or other means used to ensure that animals can control their thermoregulatory environment. Include a description of IACUC/OB approved exceptions, if applicable. [*Guide*, p. 43]

Standard housing rooms for rodents are set at 73 ˚F. To allow thermoregulation, mice are provided with nesting materials including nestlets, enviro-dri, and a combination of aspen chips and shavings to promote nest/shelter building. Rats are housed on aspen shavings to permit burrowing; they also have PVC tubes. Additionally, singly housed rats receive enviro-dri. For other species, temperatures are maintained within the species' thermoneutral zones for all indoor facilities. Stock tank temperature and outdoor aviary fluctuations are according to normal seasonal changes, and animals have appropriate cover and means to acclimate. In cold weather, panels are put on aviary sides to shield from extreme temperature fluctuations, and birds are allowed access to an indoor heated area.

2. Ventilation and Air Quality [*Guide*, pp. 45-47]

a. Describe the methods and frequencies of assessing, monitoring, and documenting the animal room ventilation rates and pressure gradients (with respect to adjacent areas).
Note: If preferred, this information may be provided in a Table or additional Appendix.

[redacted]
Triennially the volumetric flow rate (CFM) for the supply and exhaust is verified for all animal facilities. Using the measured volumetric flow rate and the physical dimensions of each space, the air exchange rate is calculated (ACH). The results of these test are documented in Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary. Interim measurements are made as requested by DCM or the investigators, if there are concerns about airflow or if room use changes. Volumetric air flow rates are measured utilizing a Balometer Capture Hood. The relative air pressure is determined by looking at the supply and exhaust volumetric flow rate, with the greater of the two measurements determining the overall relative pressure differential for each space.

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[redacted]
The area identified as [redacted] see Appendix 3, commonly referred to as the [redacted] has continuous monitoring of certain critical control points related to the [redacted]. Pressure gradients between the corridor and the anteroom [redacted] the anteroom [redacted] and the procedure room [redacted]; and the procedure room [redacted] and the holding rooms [redacted] are continuously monitored utilizing the Building Automation System (BAS). Failure to maintain the required pressure differentials will trigger an alarm on the BAS as well as locally at the laboratory.

b. Describe ventilation aspects of any special primary enclosures using forced ventilation.

Techniplast ventilated racks in [redacted] and [redacted] are HEPA filtered and provide 60 air changes per hour. Animal Care Systems ventilated racks in [redacted] are connected to room exhaust.

c. If any supply air used in a room or primary enclosure is recycled, describe the percent and source of the air and how gaseous and particulate contaminants are removed.

The [redacted], contains a walk-in refrigerator with a fan that recirculates air within the unit. Stickleback fish are housed within this unit.

3. Life Support Systems for Aquatic Species [*Guide*, pp. 84-87]

a. Provide a general description of institutional requirements for enclosures using water as the primary environmental medium for a species (e.g., aquatics).

The institutional expectation is for aquatic species to be housed in environments that are species-appropriate, and maintained consistent with species needs and *Guide* expectations.

b. Provide a general description of overall system(s) design, housing densities, and water treatment, maintenance, and quality assurance that are used to ensure species appropriateness.
Note: Facility-specific tank design and parameter monitoring frequencies should be summarized in **Appendix 12** (Aquatic Systems Summary).

Zebrafish are housed in recirculating Z-Hab Duo Systems by [redacted], and [redacted] Housing Systems. City water is purified via a reverse osmosis system, then automatically reconstituted using sea salt, and buffered by sodium bicarbonate via automatic dosing. Conductivity (salinity), pH, water temperature, and reservoir water level are

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monitored and regulated automatically by the automated systems. Email messages are generated if problems are detected. Zebrafish are stocked at 10 adult fish per liter, as approved by the IACUC. Animal health and routine husbandry and care including feeding is also monitored and recorded on a daily basis by investigators.

Sticklebacks are housed in recirculating systems. City water is treated with biofilters and reverse osmosis, then salts are added. One third of the water from each tank is changed on a minimum weekly basis or as necessary, and the water is tested approximately 3 days after to ensure quality. The system is under full-spectrum light for illumination. Fish are housed in groups of 15-20 individuals per 29-gallon tank. Fish health (e.g. behavior/morphology) is monitored on a daily basis.

Artificial ponds made from 150-gallon or 300-gallon stock tanks are located outdoors. At the [redacted] tanks are cleaned with bleach prior to being filled with well water that has been treated with chlorine. Tanks are allowed to stand for at least 24 hours to allow chlorine to dissipate into the air and then are stocked with leaf litter (generally 0.5 kg to 1.25 kg/tank) to provide a nutrient source to support a pond food web. Approximately 2-3 days later, tanks are innoculated with concentrated solutions of zooplankton and algae collected from nearby ponds to begin the development of a pond food web. Vertebrate animals (fish or tadpoles) are generally added to tanks about one week later. Densities of fish generally do not exceed 1 fish/25 gallons (*Enneacanthus* spp.), 2 fish/25 gallons (*Umbra pygmaea*) or 4 fish/25 gallons (*Gambusia*). Experiments with fish are generally run between March and October, but the total duration for which fish are present in an artificial pond depends on the purpose of the particular experiment.

Poison dart frog tanks typically have two frogs, provided with three substrate layers (carbon/gravel for water purification, separated by non-toxic plastic mesh from a clay layer, with a moss layer on top. Live plants, pools in plastic tubes, and a coconut husk hide are provided. Sterilized water is filtered before being used for pools or misting. Tanks are monitored each day.

4. Noise and Vibration [*Guide*, pp. 49-50]

Describe facility design features and other methods used to control, reduce, or prevent excessive noise and vibration in the animal facility.

In [redacted], mechanical rooms containing large rotating equipment such as fans and pumps are typically located at a distance from animal holding areas. At the point of where the HVAC ductwork connects to the AHU, a flexible connection is used to prevent the transmission of vibration. Spring style isolation dampers as

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well as vibration isolating footpads are used on equipment. AHU also have sound attenuators to help reduce transfer of sound from the AHU to the HVAC system. Mechanical room walls and in many cases other areas are constructed of block walls that have been fully grouted instead of hollow core block. Fluorescent lights with electronic ballast have been replaced with LED light fixtures. Sound attenuation blankets are above animal rooms. Sound attenuated alarms are used in lieu of standard fire alarm horns. Use of soft wheel casters and housing sound-sensitive species away from noise-generating areas is practiced.

B. Animal Housing (all terrestrial, flighted, and aquatic species)

1. Primary Enclosures

Note: A description of primary enclosures used (e.g., cages (conventional, individually-ventilated cage systems (IVCS), etc.), pens, stalls, pastures, aviaries, tanks) should be included in **Appendix 13**.

a. Describe considerations, performance criteria and guiding documents (e.g. *Guide*, *Ag Guide*, ETS 123 and/or other applicable standards) used by the IACUC/OB to verify adequacy of space provided for all research animals, including traditional laboratory animal species, agricultural animals, aquatic species, and wildlife when reviewing biomedical, field and agricultural research studies.

The IACUC uses the *Guide* as the primary reference for verification of adequacy of space provisions. Other guidance found in AAALAC's Reference Resources are consulted for species not specifically addressed in the *Guide*. If information is not present in these documents, scientific literature is consulted and performance standards applied to determine and verify optimal space provision for animals.

b. Describe space exceptions to the guiding documents (*Guide*, *Ag Guide*, ETS 123, and/or applicable standards), indicating the references, considerations and performance criteria used (e.g., by the IACUC/OB) to verify adequacy of space provided for all animal species covered by the program. [*Guide*, pp. 55-63]

The IACUC has approved an exception to the *Guide's* recommended 5 zebrafish per liter based on current literature and consultation with experts in zebrafish husbandry (ZIRC). Ten adult zebrafish per liter are allowed.

2. Environmental Enrichment, Social, and Behavioral Management [*Guide*, pp. 52-55; 63-65: *Ag Guide*, Chapter 4]

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a. Environmental Enrichment

i. Describe the structural elements of the environment of primary enclosures that may enhance the well-being of animals housed (e.g., resting boards, privacy areas, shelves/perches, swings, hammocks).

Mice are provided with nestlets, PVC tubes and “trapeze” rings in cages (unless the IACUC has approved an exception to provision of enrichment). They may also receive paper huts, paper tubes, and igloos with or without wheels.

Rats are provided with PVC tubes and ledges.

Non-human primates have tunnels, swings, aluminum ferris wheels and perches.

Birds have nest boxes, perches, and artificial foliage.

Frogs have tropical plants, coconut husks, and PVC breeding pools.

Sticklebacks have gravel substrate in their tanks.

Oyster shells are used for naked gobies.

ii. Describe nonstructural provisions to encourage animals to exhibit species typical activity patterns (e.g., exercise, gnawing, access to pens, opportunity for exploration, control over environment, foraging, denning, burrowing, nesting materials, toys/manipulanda, browsing, grazing, rooting, climbing).

Mice are provided with nesting materials, including enviro-dri, tissue paper, and a combination of aspen chips and shavings as bedding substrates to encourage burrowing and nest building. When singly housed or when animal use protocols permit, they are also provided with chocolate nylabone nuggets and chew blocks.

Rats are provided with chocolate nylabones, chew blocks, enviro-dri, and food treats (if protocols permit).

Pigs receive balls, nylabones, and an abundance of treat foods, including fresh fruits and vegetables, tomatoes, fruit loops, and other treats. Food treats are scattered in aspen shavings to encourage rooting behavior.

Non-human primates get chopped fruit and vegetables, popcorn, pomegranate, cereal, pasta, oatmeal, frozen fruit cubes, frozen berries, yogurt, whole melons, pumpkins, fresh corn in husk, whole coconuts,

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squash, and other seasonal foods, videos, radio, mirrors, pools, sprinklers, metal balls, chew toys, forage boards, and puzzle feeders.

Finches are provided fresh greens, eggs, millet, and cuttlebone.

Rabbits receive fresh vegetables and fruits, plastic dumbells, plastic keys, bells, and kong toys, and timothy hay.

b. Social Environment [*Guide*, p. 64]

i. Describe institutional expectations or strategies for social housing of animals.

Social housing is the default method of housing for social species; however, exemptions can be made and are considered by the IACUC on a case-by-case basis. Scientific justifications for exemptions to social housing are described in the AUP.

ii. Describe exceptions to these expectations (e.g., veterinary care, social incompatibility) and other typical justification approved by the IACUC/OB for housing animals individually.

Exceptions to social housing are based on social incompatibility resulting from inappropriate behavior, veterinary concerns regarding animal well-being, or scientific necessity approved by the IACUC (or comparable oversight body). IACUC-approved exceptions for social housing include aggression, food/fluid manipulation studies requiring intake measurement, post-procedural and post-surgery when impaired (EAE and spinal cord surgery), animals with cranial or other implants, studies involving wheel-running and activity monitoring, metabolic cage housing, and epigenetic studies.

iii. Describe steps taken with isolated or individually housed animals to compensate for the absence of other animals (interaction with humans, environmental enrichment, etc.).

Animals that must be singly housed are provided with several options. Extra enrichment is provided (unless the protocol precludes enrichment). Animals are placed so that they can maintain visual, auditory, and olfactory contact with conspecifics. Non-human primates can have protected contact with conspecifics and possibly supervised full contact, based on their behavioral interactions. Non-human primates, and pigs receive extra enrichment and positive human interaction.

c. Enrichment, Social and Behavioral Management Program Review [*Guide*, pp. 58, 69]

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Describe how enrichment programs and exceptions to social housing of social species are regularly reviewed to ensure that they are beneficial to animal well-being and consistent with the goals of animal use.

The enrichment coordinator (assisted by animal care and vet tech staff) provides ongoing monitoring of the enrichment program, including non-human primates that are undergoing socialization, and makes adjustments accordingly. The IACUC reviews specific approved scientific exceptions to social housing during protocol evaluation and renewal. Attention is given to singly housed animals during semi-annual evaluations. The entire written enrichment program and *Guide* exceptions to social housing are reviewed annually by the IACUC.

d. Procedural Habituation and Training of Animals [*Guide*, pp. 64-65]
Describe how animals are habituated to routine husbandry or experimental procedures, when possible, to assist animals to better cope with their environment by reducing stress associated with novel procedures or people.

Primates are shifted into quad cages and connecting tunnels and separated in order to facilitate handling for husbandry and experimental procedures. Positive reinforcement (typically food treat) is used whenever possible to reward appropriate behaviors. Pigs are trained via food rewards to shift pens prior to cleaning.

e. Sheltered or Outdoor Housing [*Guide*, pp. 54-55]

i. Describe the environment (e.g., barn, corral, pasture, field enclosure, flight cage, pond, or island).

Amphibians and fish are seasonally housed in mesocosms on the [redacted] Mesocosms consist of 150-300-gallon plastic stock tanks with central standpipes to prevent overfilling. Birds are housed in outdoor aviaries with shelter access at the [redacted].

ii. Describe methods used to protect animals from weather extremes, predators, and escape (windbreaks, shelters, shaded areas, areas with forced ventilation, heat radiating structures, access to conditioned spaces, etc.).

Mesh screens cover the tanks and are tightly secured to prevent predators from accessing mesocosm occupants at [redacted]. Water depth and leaf litter within the tank buffer temperature extremes and provide appropriate cover for animals. Mesocosms are designed to replicate actual environmental conditions in the wild. At [redacted], birds have access to a heated indoor area in winter months. Solid panels are placed around the wire aviaries to insulate and provide windbreaks during winter.

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iii. Describe protective or escape mechanisms for submissive animals, how access to food and water is assured, provisions for enrichment, and efforts to group compatible animals.

Everything needed is provided in the mesocosms, including cover, food, and natural surroundings. At [redacted], there are multiple perches, nests, and abundant cover for submissive animals to hide in. Multiple food and water sources are provided in the aviaries to ensure all animals have access.

f. Naturalistic Environments [*Guide*, p. 55]

i. Describe types of naturalistic environments (forests, islands) and how animals are monitored for animal well-being (e.g., overall health, protection from predation).

N/A

ii. Describe how food, water, and shelter are provided.

N/A

iii. Describe how animals are captured.

N/A

C. Animal Facility Management

1. Husbandry

a. Food [*Guide*, pp. 65-67]

i. List type and source of food stuffs.

Rats and Mice: irradiated [redacted] irradiated [redacted] Mouse Diet 20, irradiated [redacted] with fenbendazole, [redacted] irradiated transgenic dough diet, [redacted]; diet gel, hydrogel, recovery gel, prenatal, [redacted]

Pigs: Purina Nature's Match Sow and Pig complete feed and Producers Pride, [redacted]; fresh fruits and vegetables, [redacted]

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Finches: [redacted] Premium Daily Diet for Finches, [redacted] Company, [redacted]; SunSeed Vita Finch Diet and KayTee Gold Spray Millet, Lab Supply; hard-boiled egg and fresh fruits and vegetables, [redacted] various seeds mixed on site at [redacted]; crickets and mealworms

Primates: [redacted] Primate Diet 5045, Lab Supply; fresh fruits, vegetables, and treats, [redacted]

Rabbits: ProLab High Fiber rabbit diet 5P25, [redacted]; timothy hay, [redacted]; fresh fruits and vegetables, [redacted]

Zebrafish: Skretting GEMMA Micro 300, 150, or 75 Skretting France; Otohime larval feeds, [redacted]

Sticklebacks: live and frozen *Artemia*, bloodworms, [redacted]

Naked Gobies: Tetrafin flake fish food

Poison Dart Frogs: *Colembola* (springtails), wingless *Drosophila*, [redacted]

Mesocosms: mesocosms are seeded with leaf litter and algae, insects, and zooplankton when they are set up, so they are self-sustaining

ii. Describe feed storage facilities, noting temperature, relative humidity, and vermin control measures, and container (e.g., bag) handling practices, for each of the following:

- vendors (if more than one source, describe each)
- centralized or bulk food storage facilities if applicable
- animal facility or vivarium feed storage rooms
- storage containers within animal holding rooms

[redacted] A 20,000 square feet facility is climate controlled with redundant HVAC systems. [redacted] constantly monitors and documents temperature to ensure that the warehouse is less than 70 degrees with 50% humidity. They are proactive in pest control and use a nationally recognized company to manage the program. Control stations are placed every 20 feet along the perimeter of the warehouse. All products are palletized and located at least 12" from wall.

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[redacted] maintains all perishable produce under refrigeration. Vermin control at [redacted] includes rodent bait stations and good sanitation.

[redacted] groceries maintain all perishable produce under refrigeration. The store is always clean and well-maintained.

Other vendors for fish and frog feed have reliably produced robust live foods and viable eggs.

Animal Facilities:
Feed is stored in [redacted] in air-conditioned rooms with concrete or epoxy-quartz floors, painted concrete block walls, and solid ceilings, or are stored according to the manufacturers' specifications. The feed storage room temperature is maintained at 70˚F or lower. Feed is stored on pallets away from walls. Special diets are refrigerated or frozen per manufacturer recommendation.

Vegetables and fruits are stored in coolers. The temperatures of the coolers are monitored continuously and are on an alarm system.

Feed storage room temperatures and relative humidity are monitored by visual observation of a high-low wall thermometer. The temperature and relatively humidity are recorded daily. Vermin control is by use of boric acid/silica gel powder, rodent traps, and good sanitation.

In [redacted], upon delivery, frozen food is kept at -20˚C in the walk-in freezer.

Culture media for *Drosophila* is maintained in plastic buckets with sealed lids. Food for *Colembola* (fish flakes) is maintained in plastic containers with screw-top lids.

Animal Rooms:
Feed is stored in animal rooms in sealed plastic barrels with plastic liners or in large covered rodent microisolator cages. Milling and feed bag opening and expiration dates are recorded on the barrel tag or cage tag.

In the stickleback rooms, food is stored in a freezer at -20˚C.

In [redacted], zebrafish food is stored in a 4˚C refrigerator.

Drosophila are raised in mason jars or plastic containers with screened lids. *Colembola* are raised in plastic or glass containers with moist soils (small air holes allow air to circulate).

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Brine shrimp eggs are stored at 4°C in sealed containers and bought from [redacted]. 24 hours prior to feeding the eggs are incubated according to established protocols for shrimp hatching. Eggs shells are filtered out then hatched live shrimp are immediately fed to the zebrafish.

iii. Describe special food preparation areas, such as feedmills and locations where special diets are formulated, if applicable. Include in the description sanitation and personnel safety practices (noting that respiratory protection is described in Section 2.I.A.2.b. ii. Standard Working Conditions and Baseline Precautions above).

Fresh food and special diet preparation at [redacted] occurs in the diet kitchen [redacted] which has a refrigerator, two sinks, a microwave and a counter top food preparation area that is the length of the room. Food preparation in [redacted] occurs in the diet kitchen [redacted] There is a refrigerator, an electric stove, a microwave oven, a large stainless steel sink and an ice maker in this room.
Sinks and countertops are sanitized daily after use, and refrigerators and floors are sanitized at least weekly.

Drosophila and *Colembola* cultures are prepared on a large table next to the sink. In the stickleback cooler and room, food is prepared near the sink. Surfaces are cleaned after use.

Fruit fly media is prepared on a large metal table in the lab, which is cleaned with non-toxic detergent.

iv. Describe how food is provided to various species (*ad libitum*, limited amounts, types of feeders).

Rodents receive feed *ad libitum* in wire bar lid hoppers, unless specified otherwise in the AUP. Feed pellets and supplements may be placed on the cage floor for animals that have difficulty accessing food in wire bar lid hoppers (e.g. weanlings, sick animals). The [redacted] Metabolic cage system calculates the amount eaten by weighing continuously via suspended cup feeder.

Finches are fed *ad libitum* in hanging plastic bird feeders, small ceramic crocks and plastic wall mounted feeders on the sides of cage.

Pigs are limit fed based on weight via food bowls.

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Non-human primates are limit fed via cage food hoppers based on animal weights. Various fruits and other enrichment foods are given daily.

Rabbits are limit fed 125-130g feed per day from a J-feeder.

Zebrafish are fed to satiation at least once daily, depending on life stage.

Sticklebacks are limit fed twice daily; a pipette is used to deliver food to the tanks.

For poison dart frogs, live food is provided in regulated amounts (determined via PI experience and that of other breeders), typically in excess. Drosophila are placed in a plastic cup, sprinkled with vitamin/mineral powder, and then an approximately equal number are shaken into each tank requiring feeding. *Colembola* are shaken into tanks from small fragments of wood in their plastic cages that they congregate on.

Mesocosms self-feed the occupants.

v. Describe special food quality control procedures including procedures for rotating stock, monitoring milling dates, nutritional quality, bio load, chemical contaminants, etc.

Quality control includes feed rotation (oldest feed used first), milling date monitored by animal care staff, and manager/veterinarian spot checks. Broken, wet, outdated, or soiled bags are discarded. Quality assurance information is available from the manufacturers; no further on-site analysis is done. All diets are stored per manufacturers' recommendations and used within 9 months of milling date (IACUC approved exception based on data from manufacturer). Finch granules have a 12-month shelf life. Feed is ordered in small batches and typically used well before expiration dates.

b. Drinking Water [*Guide*, pp. 67-68]

i. Describe the water source, treatment or purification process, and how it is provided to the animals (e.g., bowls, bottles with sipper tubes, automatic watering, troughs, ponds, streams).

Water is supplied to the ECU campuses (Main and HSC) by the Greenville Utilities Commission. The other sites remote to the campus are supplied by other local utility providers. In all cases water is supplied by a public utility and meets the Federal Clean Water Drinking Standards. Steam for autoclaving feed, cages, and bedding in [redacted] is provided by a clean steam generator to avoid boiler chemical contamination.

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Primates, rabbits and pigs are on automatic watering systems, while water is provided to mice, rats, and some rabbits via bottle and sipper tubes.

Mice housed in the barrier receive acidified water provided via bottle and sipper tubes.

Rodents in quarantine housed in individually ventilated cages, immune compromised mice, and SCARB mice receive bottled autoclaved water.

Poison dart frogs are given deionized, carbon-filtered water. Tap water is provided in crocks, bird waterer J tubes, or bowls to finches.

Zebrafish racks are equipped with reverse osmosis to purify city water. Water is then reconstituted with appropriate salts and minerals.

Stickleback, water is treated to remove impurities. Commercial aquarium salt is added to water to maintain a low level that is healthy for sticklebacks, about 10% of ocean water or 3 parts per thousand.

ii. Describe methods of quality control, including monitoring for contaminants.

Contaminant reports (trihalomethanes, organics, coliforms, etc.) are provided quarterly by Greenville Utilities Commission. Microbiologic testing is performed in-house. Routine pH testing (litmus paper) of acidified water occurs weekly. Every quarter, pH testing is done with an electronic pH meter.

iii. If automatic water delivery systems are used, describe how they are maintained and sanitized.

Filters are replaced annually and individual lixit valves are flushed daily.

c. Bedding and Nesting Materials [*Guide*, pp. 68-69]

i. Describe type(s) and how used for various species.

Mice and rats	Irradiated Aspen Chips	Contact
	Irradiated Aspen shavings	Contact
	Irradiated Bed-O-Cobs (1/8″)	Contact
	Alfa-Cobs	Non-contact
	Alpha-dri	Contact
	Enviro-Dri	Contact
Pigs	Aspen Shavings	Contact

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Rabbits	Pan liners Shavings	Non-contact Contact
Finches	Aspen shavings Pea gravel [redacted]	Contact Contact
Poison dart frogs	Sphagnum moss, clay, carbon soil covered by leaves	Contact
Naked gobies	Clean disarticulated oyster shell	Contact

ii. Describe bulk bedding storage facilities, if applicable, including vermin control measures.

Bedding is stored in a dedicated feed/bedding room in the [redacted]. In [redacted], there are separate dedicated storage rooms for food and bedding. In both, storage is on pallets at least 1.5 inches above the floor and 6 inches from the wall. Vermin control is by use of boric acid/silica gel powder, rodent traps, roach traps, and good sanitation. Dried moss is kept in a closed plastic container.

iii. Describe quality control procedures, including monitoring for contaminants.

Bedding is examined on arrival by technicians to detect presence of broken, wet, or soiled bags. The contents are evaluated as used for evidence of mold, gross contamination, etc. Bedding barrels are labeled with the type of bedding and the date opened.

d. Miscellaneous Animal Care and Use Equipment

i. Describe motorized vehicles and other equipment (e.g., trailers) used for transporting animals, noting the type and how the cargo compartment is environmentally controlled, if applicable.

The Department of Comparative Medicine has four vehicles for use in its animal care program:

[redacted] Front and Rear A/C and heater
Front and Rear A/C and heater
Front A/C and heater
Front A/C and heater

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In [redacted], there is a [redacted] truck with bed cover. If necessary, the covered cargo compartment can be cooled by opening the window between the cab and cargo area, and the windows in the bed cover.

ii. Describe other animal care related equipment used in the animal care program (specialized equipment for exercise or enrichment, high pressure sprayers, vacuum cleaners, tractors, trailers, spreaders, etc.).

ECU animal care program is equipped with the following:
High pressure washers for sanitizing animal housing room floor and walls
Standard floor buffers
Shopvacs for general housekeeping, not for soiled rodent bedding
Hydraulic lifts
Hydraulic Drum Lifter
Room foggers for room decontamination
Large animal water tubs used for primate enrichment swimming
Television and VCR set-ups for primate enrichment
Radios used for primate enrichment
Hepa filtered Surgery Vacuum

e. Sanitation [*Guide*, pp. 69-73]

i. Bedding/Substrate Change

1) Describe frequency of contact and non-contact bedding change for each species and enclosure type (solid-bottom or suspended) or pen.

Non-human primates: NHP are housed in enclosures with suspended floors. Enclosures and room floors are hosed twice daily to remove feces, urine and residual food. Cages are sanitized every other week.

Mice and Rats: Static microisolator cages are changed at least once a week. Cages with more than two animals are typically changed twice a week or more often if needed. Individually ventilated cages housing rodents are changed every two weeks or more frequently if needed. Bedding change intervals for rodents with specific husbandry needs (diabetic mice, etc) are more frequent, as determined by the DCM veterinary staff.

Pigs: Pigs are housed in pens with solid concrete floors. Shavings used for enrichment

Rabbits: Pan liners are changed three times a week. Shavings are changed weekly

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Finches: In the bird cages, the aspen shavings are changed weekly. Shavings in the aviaries are removed and replaced every two weeks.

2) Describe any IACUC/OB approved exceptions to frequencies recommended in the *Guide* or applicable regulations and the criteria used to justify those exceptions.

Cages on ventilated racks are changed every two weeks, based on performance standards in literature, and approved by the IACUC. Bird aviaries are sanitized every 6 months based on environmental monitoring and is IACUC approved.

3) Note the location where soiled bedding is removed from the cages/enclosures and where clean bedding is placed into the cages/enclosures.

Soiled bedding is removed from cages on dirty side of the cage washrooms in the [redacted] facilities in HEPA filtered bedding dump stations. Clean bedding is added to clean cages in the clean side of the cage wash rooms of these two facilities.

Soiled cages from [redacted] are transported to the [redacted] cage wash, where they are dumped, washed, and refilled with bedding.

Bedding from quarantine and biohazardous animal housing rooms are autoclaved prior to dumping cages on the dirty side of cage wash.

Soiled shavings for pigs and birds are scooped and placed into waste containers in the animal room. Soiled bedding is either taken to landfill (non-biohazard) or incinerated (if biohazard).

ii. Cleaning and Disinfection of the Micro- and Macro-Environments
Note: A description of the washing/sanitizing frequency, methods, and equipment used should be included in **Appendix 14** (Cleaning and Disinfection of the Micro- and Macro-Environment) and **Appendix 15** (Facilities and Equipment for Sanitizing Materials).

1) Describe any IACUC/OB approved exceptions to the *Guide* (or applicable regulations) recommended sanitation intervals.

Historic (pre-2006) husbandry for finches had included daily hosing of aviaries and no use of shavings or other floor substrate. As a result,

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fledglings were becoming wet and chilled and fledgling survival rates decreased significantly. New IACUC-approved husbandry practices were instituted in 2006. This included use of shavings and decreased frequency of emptying aviaries to power wash. Fledgling survival numbers have since increased and mortality rates have decreased.

Sanitation intervals for various ectothermic species are described within the AUPs and approved by the IACUC.

At the [redacted] outdoor aviaries, aviaries are cleaned weekly, and pea gravel is raked every two months. The IACUC has approved husbandry practices for this outdoor aviary.

2) Assessing the Effectiveness of Sanitation and Mechanical Washer Function

a) Describe how the effectiveness of sanitation procedures is monitored (e.g., water temperature monitoring, microbiological monitoring, visual inspections).

Each cage washer has a temperature recorder. Temperature tapes are placed in the first load of the day. Cages and equipment are visually inspected after each load. Microbiological monitoring is conducted quarterly to assess sanitation effectiveness of both cage-washed and hand-washed items.

b) Describe preventive maintenance programs for mechanical washers.

Four times a year, the cage washers receive preventive maintenance by an outside contractor [redacted] to ensure proper functioning. Sediment screens are cleaned daily by washroom technicians.

f. Conventional Waste Disposal [*Guide*, pp. 73-74]
Describe the handling, storage, method and frequency of disposal, and final disposal location for each of the following:

i. Soiled bedding and refuse.

Soiled bedding is removed from cages in bedding disposal units within the dirty cage wash areas. It is collected in trash barrels (on wheels) in respective cage washrooms. The barrels are rolled to the dumpsters for disposal by a contractor in the county sanitary land fill.

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ii. Animal carcasses.

Animal carcasses are sealed in double polyethylene bags or other impervious materials which are then stored in walk-in coolers in the [redacted] and in dedicated freezers in all other areas. The bagged carcasses are transferred in dedicated biohazard carts to a central location for pickup by [redacted]

g. Pest Control [*Guide*, p. 74]

i. Describe the program for monitoring and controlling pests (insects, rodents, predators, etc.). Include a description of:

- monitoring devices and the frequency with which devices are checked
- control agent(s) used and where applied, and
- who oversees the program, monitors devices, and/or applies the agent(s).

Live trapping of feral or escapee mice is the common method used within the animal facilities. Trapped rodents are terminally bled and serology is performed. Rodent traps are baited with rodent chow and water and checked three times a week by animal care staff per IACUC approved SOP.

Methods used for routine insect control are boric acid, borate or Avermectin bait placement outside the building. In addition, Demon® a persistent synthetic pyrethrin is applied only in areas away from animals, caging, feed, bedding, feeders or watering devices. [redacted] (contractor) visits monthly. Insect traps are placed and monitored three times a week by animal care staff. [redacted] applies approved chemical insecticides outside annually or upon request by DCM management.

ii. Describe the use of natural predators (e.g., barn cats) or guard animals (e.g., dogs, donkeys) used for pest and predator control, if applicable.

N/A

iii. Note how animal users are informed of pesticide use and how animal users may opt out of such use in specific areas.

If insecticides are intended to be used in an animal room, animal users would be notified prior to application.

h. Weekend and Holiday Animal Care [*Guide*, pp. 74-75]

i. Describe procedures for providing weekend and holiday care. Indicate who (regular animal care staff, students, part-time staff, etc.) provides and

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oversees care and what procedures are performed.

One veterinary staff member is on call at all times including weekends and holidays. Two to six animal care staff members are on duty weekends and holidays. One animal care supervisor or an experienced technician is on call at all times including nights, weekends and holidays. Veterinarians and supervisors are available by phone, pager, and/or cell phone. Weekend and holiday care for animals housed in the [redacted] facilities is provided by graduate and undergraduate students. PIs assist as needed. The poison dart frog [redacted] has used DCM animal care staff to provide care when needed. [redacted] regular staff provide weekend and holiday care.

ii. Indicate qualifications of weekend/holiday staff if not regular staff.

N/A

iii. Describe procedures for contacting responsible animal care and/or veterinary personnel in case of an emergency.

A list of on-call personnel and contact numbers is posted in each animal facility, steam plant, facilities services, and BSOM police. DCM voice mail directs callers to appropriate on-call personnel. A list of veterinary staff contact information is posted in all animal housing and use areas.

2. Population Management [*Guide*, pp. 75-77]

a. Identification

Describe animal identification methods for each species (e.g., microchips, cage/tank cards, collars, leg bands, tattoo, ear tags, brands).

Non-human primates: chest/leg tattoo
Rats: cage cards, ear tag, tattoo
Mice: cage cards, ear tag, tattoo, ear punch
Rabbits: ear tags, tattoo, cage cards
Pigs: ear notches
Birds: leg bands
Frogs: cage cards
Fish: tank cards

b. Breeding, Genetics, and Nomenclature

i. Describe the program for advising investigators on the selection of animals based on genetic characteristics.

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The DCM veterinary staff is available for consultation and frequently advises on genetics and animal model selection. The DCM library has current literature, and veterinarians also direct PIs to vendor websites.

ii. Describe the program for advising investigators on using standardized nomenclature to ensure proper reporting of the identification of the research animals with regard to both the strain and substrain or the genetic background of all animals used in a study.

Animal Use Protocols are reviewed for correct nomenclature and investigators are advised on appropriate strain/substrain designation.

iii. Describe genetic management techniques used to assess and maintain genetic variability and authenticity of breeding colonies, including recordkeeping practices (*Guide*, pp. 75-76).

To ensure authenticity and genetic variability, investigators are encouraged by veterinarians to follow specific practices, including routine genotyping of mouse strains, performing backcrosses of congenic strains and refreshing existing breeding colonies of inbred strains on a regular basis to prevent genetic bottlenecks. Investigators are also expected to keep accurate breeding records.

iv. For newly generated genotypes, describe how animals are monitored to detect phenotypes that may negatively impact health and well-being. Note that the methods used to report unexpected phenotypes to the IACUC/OB should be described in section 2.1.B.1.c.ii, "Unexpected Outcomes that Affect Animal Well-Being."

Expected debilitating phenotypes are described in the AUP and include procedures to mitigate negative effects. Annual review forms specifically address unexpected outcomes. Animal care and veterinary staff observe animals closely and are attentive to any deleterious changes in phenotype; this information is reported to the IACUC, typically in monthly meetings.

III. Veterinary Care [*Guide*, pp. 105-132]

Note: Complete each section, including, where applicable, procedures performed in farm settings, field studies, aquatic environments, etc.

A. Animal Procurement and Transportation [*Guide*, pp. 106-109; *Ag Guide*, pp. 8; 45; 50-57]

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1. **Animal Procurement**

Describe the method for evaluating the quality of animals supplied to the institution (from commercial vendors, other institutions, etc.).

Rodents: Both vendor and non-commercial source health history reports are initially used to evaluate rodent quality. Additional testing and/or treatment of animals prior to shipment may be requested from institutions that are non-commercial vendors.

Rabbits: Vendor health history reports are used to evaluate rabbit quality. Rabbits are obtained from 2 commercial Pasteurella-free sources.

Pigs: Most swine are obtained from the [redacted] swine herd. The herd at [redacted] is a closed, brucellosis-free group. Breeder animals are vaccinated against major pig pathogens. Swine may also be purchased from [redacted], an AAALAC-accredited commercial vendor.

Primates: Macaques were obtained from either [redacted] and require proof of a negative test for *Mycobacterium tuberculosis* and Maccacine herpesvirus 1 prior to shipment. Herpes B positive animals are not accepted. Colony and individual health and behavioral information is provided with every primate shipment. Health information is reviewed by a veterinarian prior to shipment.

Finches: Multiple finch species (Australian and Timor zebras, European society, Cordon Bleu, shaft-tail, red breasted, goldbreasted, pintailed Wydah, and fire or red billed) have been used over the last 3 years. Finches have been obtained from commercial and private breeders and another institution. Health history information was available from the private breeders and the institution.

Amphibians: Poison dart frogs are mainly purchased from a single, reliable vendor that the PI has used for years. Field collected native North Carolina adult frogs, as well as tadpoles, are brought directly to [redacted] building or [redacted] from the field, then placed in tanks for experiments.

Fish: Zebrafish are purchased from the [redacted] Extensive information, including pedigrees and frequency of developmental deformities, is available on the zebrafish obtained from [redacted]. Both sources provide facility health history information. Gobies and three-spined sticklebacks are wild-caught by PIs and their graduate students.

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2. Transportation of Animals

Describe how animals are transported between outside sources and the institution and within the institution, including loading, unloading, level of biosecurity, immune status and specific pathogen status (consider all species, including aquatic and semi-aquatic species).

Rodents, rabbits, swine, and primates are delivered to [redacted] by climate-controlled ground transportation. Commercial vendors/couriers deliver rodents, rabbits, and primates. Pigs are picked up from [redacted] by DCM staff in the box truck.

Upon arrival, animals are taken to the appropriate rooms and uncrated. Rodent shipping boxes are sprayed with Clidox before animals are removed. Mice and rats are transferred to cages under a change station. SPF, SPF breeding, and immunocompromised mice from approved vendors are taken to the barrier facility and uncrated under a change hood using aseptic technique or taken to conventional housing rooms in the facility and uncrated under either a biological safety cabinet or a change hood.

Rodents destined for other facilities [redacted] are initially delivered to the [redacted] loading dock for crate disinfection, and then transported in the DCM van [redacted] or by enclosed cart [redacted] for uncrating and housing. Cages of mice and rats originating from either [redacted] may also be transported to [redacted] in the DCM van or by enclosed cart to [redacted]

Fish and frogs are delivered to either [redacted] or to the [redacted] loading dock. Zebrafish or poison dart frogs are shipped directly by the supplier via overnight courier to [redacted] or the [redacted]. Wild-caught amphibians are transported in padded containers supplied by the PIs that keep the animals moist and ventilated in the [redacted] truck. Wild-caught fish are transported in aerated buckets/coolers or cooled oxygenated bags. Wild-caught fish are brought to main campus by ground or air transportation, or a combination of the two methods.

Finches are shipped overnight in approved crates designed for birds.

Rodents from non-approved vendors are delivered to either [redacted] dock for quarantine. The crates are disinfected and taken directly to quarantine or the acute ‘dirty’ rodent room by a dedicated technician who does not enter the animal facility after performing husbandry duties.

Transportation within the institution varies by species. Rodents are transported in covered filter-topped cages on carts or in cages or disposable transport containers within an opaque secondary container. An enclosed transport cage is used to move anesthetized swine between [redacted]. Primates are transported in

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transport cages within [redacted]. Finch transport is via covered small bird cages. Fish and amphibian transports are via small container or bucket.

B. Preventive Medicine

1. Animal Biosecurity [*Guide*, pp. 109-110]

a. Describe methods used to monitor for known or unknown infectious agents. Note that if sentinel animals are used, specific information regarding that program is to be provided below.

For mice and rats, DCM places sentinel animals on each rack and has a sentinel monitoring program that includes quarterly serology, parasitology, and necropsy. PCR testing is done annually for *Helicobacter*.
Rodents from non-approved vendors undergo quarantine for a minimum of 3-4 weeks. During that time, they are treated for ecto- and endo-parasites and fecal PCR tested for viral, parasitic and bacterial pathogens. In addition to sentinel monitoring, cell lines and biologics to be used in rodents are tested for pathogens. Other species are routinely screened for various viral, bacterial, and parasitic agents. Individual animal screening and necropsy are also conducted.

b. Describe methods used to control, contain, or eliminate infectious agents.

Separation by species and health status.
Separation of ill animals from cage, aviary, tank or pen mates.
Rigorous pathogen elimination program implemented when agents identified.
Follow room entry order- rodent rooms, with cleanest health status being entered first.
Rodent cage changes performed under a biological safety cabinet or change station.
Wearing appropriate PPE including gloves and clean gowns when handling the animals. Changing gloves between PIs or racks is standard practice.
Showering and changing scrubs or clothing after being in a ‘dirty’ area in order to go into a clean area (re-entry from dirty to clean areas only done in extenuating circumstances).
Proper sanitation with effective disinfectants for animal and procedure rooms; sanitation practices modified accordingly during pathogen outbreak.
Pest control program including feral animal monitoring.
Appropriate room quarantine.
Testing biological materials that are used in research prior to animal administration for pathogens that can affect the animals.
Appropriate disinfection of nets and tanks used for aquatic species.

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2. Quarantine and Stabilization [*Guide*, pp. 110-111]

a. Describe the initial animal evaluation procedures for each species.

Rodents from approved vendors are evaluated by an animal care technician upon arrival. Any health problems detected at this initial stage are communicated to the veterinary staff and animals are examined/treated promptly.

Rodents from other institutions or non-approved vendors are evaluated by the import/export coordinator when uncrated in the quarantine area or "dirty" animal room. Veterinary staff are notified if any problems are identified. Quarantine rodents are treated for ecto- and endo-parasites by feeding fenbendazole chow and using Mite-Arrest cotton balls inside cages. Quarantine diagnostic samples are taken at this time for parasitology.

Animal and veterinary technicians examine rabbits and pigs for health problems upon arrival, and veterinarians are notified if problems are observed.

Veterinary staff examine NHPs on arrival. Sick or injured animals are isolated from the others and treated as appropriate.

Finches are evaluated on arrival by animal care staff; abnormalities are reported to veterinary staff.

Poison dart or wild-caught frogs are examined for illness or trauma upon receipt, and veterinarians are notified if problems are observed.

PIs and graduate students on main campus or DCM staff on health sciences campus visually inspect fish (or in some cases, eggs) upon arrival for health problems.

b. Describe quarantine facilities and procedures for each species. For each species, indicate whether these practices are used for purpose-bred animals, random-source animals, or both.

Rodents that are not from approved vendors are routinely quarantined in a designated quarantine room which is isolated and separate from approved vendor animals. Animals are housed in autoclaved individual ventilated caging (IVC). An autoclave is located within the quarantine area so that cages can be autoclaved out before going to cage wash. The quarantine room contains a biological safety cabinet for cage changing. Non-approved vendor animals with a very clean health history report are occasionally housed in a separate designated quarantine area. Different technicians typically care for the quarantine and general rodent populations during the work week. At other

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times, room entry order is followed, and quarantined rodents are checked after technicians have checked rodents in clean areas.

Newly acquired poison dart frogs are housed in the same room in tanks separate from the general colony. Quarantined poison dart frogs are maintained in a separate section of [redacted], on a separate shelf, in separate tanks. Newly acquired animals are handled last.

Newly acquired finches are housed in a room separate from the established colonies. Different technicians care for the quarantine and general population and room order entry is followed.

Newly acquired NHPs are housed separately from established colonies while being TB tested, serologically screened, and evaluated. Primate quarantine period is at least 6 weeks.

Wild-caught sticklebacks and other fish are housed separately from colony-reared animals.

Pigs and some rabbits are used acutely and do not undergo quarantine procedures. They are housed separately from other species, observed for health problems.

Wild fish are held in separate tanks with separate filtration using equipment not shared with other tanks.

c. Describe the required/recommended stabilization period for each species.

Rodents: 5 days
Primates: minimum 6 weeks
Pigs: 5 days
Rabbits: 5 days
Birds: 30 days
Poison dart frogs: 2 weeks
Fish: recommended minimum 30 days

3. Separation by Health Status and Species [*Guide*, pp. 111-112]

a. Describe the program for the separation of animals by species, source, and health status. If the animals in different status are not maintained separately, describe circumstances in which mixing occurs and explain the rationale for mixing.

Animals are routinely separated by species and health status.

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Rodents of the same species from approved vendor sources with the same health status may be housed in the same room. Rodents of the same species from non-approved vendors are initially quarantined, but once similar health status has been established, they may be co-housed.

All zebrafish are housed on the same rack following quarantine.

Following quarantine, wild-caught and captive raised sticklebacks are housed within the same room.

b. Describe situations where multiple species may be housed in the same room, area, or enclosure.

Finches that are separate species but related family (Estrildid finches) are co-housed in aviaries. This facilitates foster parenting when needed, and it is common for these social species to flock together in the wild.

Different species of poison dart frogs are kept separately (in separate tanks) within the same room.

Experimental design for predator prey studies requires that multiple species are co-housed in the same artificial ponds at [redacted].

Finches may be co-housed in large aviaries with different compatible bird species at [redacted] (mixed flock).

c. Describe isolation procedures and related facilities for animals.

Sick animals are isolated from healthy cage, pen, aviary or tank mates and may be taken to a separate isolation room as necessary. A veterinarian determines when animals need to be isolated and/or moved.

C. Clinical Care and Management [*Guide*, pp. 112-115]

1. Surveillance, Diagnosis, Treatment and Control of Disease [*Guide*, pp. 112-113]

a. Describe the procedure(s) for daily observation of animals for illness or abnormal behavior, including:

- the observers' training for this responsibility
- method(s) for reporting observations (written or verbal)
- method(s) for ensuring that reported cases are appropriately managed in a timely manner.

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Animal care technicians observe animals daily for illness or abnormal behavior. Additionally, veterinary staff make rounds on a regular basis. Animal care technicians follow DCM veterinary care SOPs and are trained in recognizing signs of illness or abnormal behavior. When animal health concerns are detected, animal care technicians report the findings to the veterinary staff in writing by submitting a “blue” card, by email, and/or verbally by phone or pager. If it is an emergency or life-threatening situation, the veterinarian is called or paged and responds immediately. Routine cases are triaged by the veterinary staff, and they are reported by email to all DCM veterinarians and PI staff. Blue cards are used to track ongoing treatments and case resolution.

In satellite facilities, PIs and/or their staff and students observe the animals daily, and check for signs of illness or abnormal behavior. Observers are familiar with the normal appearance and behavior of their species. Observations of sick individuals are written as comments in the care log and reported to the supervising faculty member and veterinary staff. Research personnel can directly contact veterinarians by phone, pager, or email to evaluate sick or abnormal animals.

b. Describe methods of communication between the animal care staff and veterinary staff and the researcher(s) regarding ill animals.

Communication between animal care staff/veterinarians and researchers is typically via email message with all parties copied. Investigators are notified with assessment and a treatment plan before treatment is instituted (except for life-threatening situations). In more urgent situations, communication by phone may also be employed and is the preferred method.

c. Describe the preventive medicine and health management/monitoring programs (e.g., physical examination, TB testing, vaccination, hoof/nail trimming, teeth cleaning/floating, vendor surveillance, use of sentinel animals) for each species.

Rodents: Vendor screening and surveillance, quarantine screening of rodents from non-commercial sources, and a quarterly sentinel monitoring program are the primary means of rodent health management and monitoring. Quarterly sentinel monitoring includes serology testing for prevalent rodent pathogens (with an expanded panel the fourth quarter), parasite testing, and annual fecal PCR testing for *Helicobacter spp*. Routine necropsy of sentinels is also performed, with abnormal tissues sent for histopathology. Histopathology of select tissues is performed for the fourth quarter. Biological materials are screened for rodent pathogens prior to introduction into animals.

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Rabbits: Preventive medicine is primarily by vendor surveillance as most rabbits are used acutely within 2 weeks of receipt. Rabbits are observed daily by animal or veterinary technicians and abnormalities in appearance or behavior are promptly reported to and managed by the veterinary staff,

Pigs: Preventive medicine is primarily by vendor surveillance as most swine are used acutely within 2 weeks of receipt. Swine are observed daily by animal care technicians and abnormalities in appearance or behavior are promptly reported to and managed by the veterinary staff.

Primates: Preventive medicine includes semi-annual physical and laboratory examination (CBC, chemistry profile, Herpes B/other simian viral screening, fecal examination for parasites), and TB testing. Fecal rectal swabs are performed annually for enteric pathogens. Dental cleaning is performed on an as needed basis. Chest films may also be taken. Vaccination against measles is also performed.

Finches: Preventive medicine includes semi-annual screening for parasites, *Salmonella spp., Mycobacterium avium,* and *Chlamydiophila psittaci*. Nail or beak trims are performed on an as needed basis.

Frogs: Preventive medicine and health management/monitoring program utilizes vendor surveillance when applicable, parasitology, and necropsy and/or histopathology of dead frogs.

Fish: Preventive medicine and health management/monitoring program relies on physical assessment, vendor surveillance, PCR testing, and necropsy and/or histopathology of dead fish.

2. **Emergency Care** [*Guide*, p. 114]

a. Describe the procedures to ensure that emergency veterinary care is continuously available for animals during and outside of regular work hours, including access to drugs or other therapeutics and equipment.

Veterinary emergency contact information is posted in every lab and throughout the animal facilities. After hours and on the weekends, the DCM answering machine specifies contact information for on-call assistance. Anyone requiring veterinary assistance calls or pages the posted contact numbers during the week or the designated on-call person during the weekend. All veterinary staff have access to all drugs, therapeutics, and other necessary support equipment all the time.

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b. Describe the authority of the Attending Veterinarian or his/her designee relative to the emergency treatment of animals in the program.

The AV or her designees have the authority to treat or remove animals from experiments, alleviate animal pain or distress, or euthanize ill or sick animals as appropriate. Every effort is made to contact the PI; however, if the PI cannot be reached within a reasonable period, the veterinary staff will do what is necessary to ensure animal welfare. Although every effort is made to maintain data integrity in the context of animal welfare, if there is disagreement between the PI and AV regarding animal treatment or euthanasia, the AV's decision is final.

3. Clinical Record Keeping [*Guide*, p. 115]

a. Describe the procedure for maintaining medical records and documenting treatment of ill animals including: clinical laboratory findings, diagnoses, treatments, medical progress records, etc. Identify the species for which individual records are maintained and where such records are kept.

Individual medical records are maintained for non-human primates and non-acute rabbits and pigs. When one of these species enters the facility, an individual file folder is generated for that animal and maintained in the surgery supervisor's office. Any incoming health information, such as a health certificate, health history information, etc., is placed in the file. As the animal is assessed, such as by physical or laboratory examination, any generated documents (i.e. physical examination form or hematology results) are placed in the file folder. If the animal becomes ill, a blue card is generated and remains with the animal until resolution of the problem and is then filed as part of the animal's medical record. The blue card documents the problem, the animal's condition based on physical and laboratory findings, a tentative or confirmed diagnosis, treatment, any follow up testing required, and progress notes on treatment response. When the problem is resolved, the blue card(s) is (are) placed in the medical record file. Blue cards are used to document illness or problems and treatment(s) in all species. Group records are typically maintained for other species.

b. Identify individual(s) (titles, not necessarily names) responsible for maintaining such records and identify where the records are maintained and who, including the IACUC/OB has access to the records.

Individual health records are kept by the surgery supervisor. Rodent and miscellaneous species problem cards and other group records are maintained in veterinary technicians' files. All veterinary staff has access to the records. The IACUC reviews records during semi-annual inspections, and it has access to records at any time.

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c. Describe the role of the Attending Veterinarian in recordkeeping.

All records are maintained under the direction and the supervision of the Attending Veterinarian.

4. Diagnostic Resources. Describe available diagnostic methods used in the program including:

a. In-house diagnostic laboratory capabilities.

The laboratory capability includes hematology, clinical chemistries, blood gases, select serology, select (basic) microbiology, parasitology, urinalysis, and cytology. The laboratory processes both diagnostic and research samples.

b. Commercially provided diagnostic laboratory services.

[redacted]) and [redacted] provide routine multi-species serology, PCR, and other testing modalities. [redacted] rodent and primate serology testing, as well as primate microbiology and rodent tumor cell line or biologic testing, are routinely sent to CRL. The NIH B Virus laboratory is used for herpes B virology and serology testing. [redacted] provides bird-specific testing. Other diagnostic laboratories, such as [redacted] and [redacted], have been used on an occasional basis.

c. Necropsy facilities and histopathology capabilities.

Both the [redacted] facilities have necropsy rooms. The rooms are equipped with stainless-steel tables, bench space, supply cabinets, and a fume hood. Both the [redacted] necropsy coolers are directly adjacent to and accessible from the necropsy rooms. Select tissues are placed in formalin for processing by [redacted]. Special stains may be requested for select species and tissues. Slides are generated by the histology laboratory and sent back to DCM for veterinary interpretation. Slides may also be submitted to [redacted], or other veterinary pathologists for interpretation.

d. Radiology and other imaging capabilities.

A digital radiology unit (Versa DR, [redacted]) is available in the radiology area adjacent to the aseptic surgery suite. An IVIS imaging unit is located in [redacted] facility for DCM and investigator use. An investigator-shared Vevo 3100 ultrasound unit is available for rodent use.

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5. **Drug Storage and Control**

a. Describe the purchase and storage of controlled and non-controlled drugs.

DCM purchases human and veterinary controlled and non-controlled drugs for veterinary clinical use. The AV holds the controlled substance registration for DCM. Controlled substances are stored securely in drug lockers within DCM. Other departments and/or investigators have controlled substance registrations with acceptable storage lockers and purchase/maintain supplies of drugs for those departments and/or laboratories. DCM non-controlled drugs are stored separately in treatment and surgical areas. Drug stock is rotated so that older items are used first. Expiration dates of all DCM drugs are checked monthly and items are discarded when expired.

b. Describe record keeping procedures for controlled substances.

Strict inventories are maintained for drugs stored in each respective lock box in DCM and are audited by a staff member. All controlled substances are recorded into the main drug log upon receipt. The date, source, and quantity are recorded and added to the balance. As the substances are taken to the other controlled substance locked cabinet, they are subtracted and balanced. When drugs are removed for use, the amount used, purpose, date, and remaining inventory are recorded.
Investigators and/or departments or institutes hold their own controlled substance license and are responsible for their own purchasing, record-keeping and inventory maintenance.

D. Surgery [*Guide*, pp. 115-123]

1. **Pre-Surgical Planning** [*Guide*, p. 116]
Describe the process(es) used to ensure adequate pre-surgical planning, including: identifying personnel; locating equipment, supplies, veterinary involvement for selecting analgesic and anesthetic agents and facilities; planning; and pre- and post-operative care.

Processes used to ensure adequate pre-surgical planning:
Veterinary staff are involved in AUP planning and pre-review.
AUPs include the personnel performing the procedures, their roles in the project, training, and location of procedures
PIs consult veterinary staff for advice on obtaining veterinary equipment and supplies
Perioperative animal health assessment and care, including humane endpoints, is reviewed by the IACUC and a veterinarian
A veterinarian reviews all AUPs that contain analgesics and anesthetic agents and makes recommendations regarding appropriateness for procedures, dosages

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routes of administration, and any refinements in either of these; pre-emptive analgesics are expected
During AUP review, a veterinarian ensures that surgical facilities are appropriate for the species and procedures outlined in the AUP
DCM veterinary staff and veterinarians maintain responsibility and oversight of the dedicated aseptic surgical facility and are responsible for pre-, intra-, and post-operative care for large animal species

2. **Surgical Facilities** [*Guide*, pp. 116-117, 144-145]
List building name(s) and room number(s) or other locations (coded, if confidential) where surgical procedures are performed. For each, describe:
   - the type of species (including rodents, fish, agricultural species, etc.)
   - nature of procedure(s) (major/minor/emergency, survival and non-survival, etc.)
   - the amount of use [heavy (daily), moderate (weekly), or light]
   - major surgical support equipment available (gas anesthesia machines, respirators, surgical lights, etc.)
   - facilities for aseptic surgery, surgical support, animal preparation, surgeon's scrub, operating room, and postoperative recovery
   - construction features of the operating room(s), including interior surfaces, ventilation, lighting, and fixed equipment used to support surgical procedures and other means of enhancing contamination control

Note: If preferred, the information requested in this section may be provided in Table.

Building	Room #	Species	Procedure	Support equipment	Usage	Type of facility	Construction	Fixed Equipment
[redacted]	[redacted]	Rodent	Minor survival, non-survival	Isoflurane vaporizer	Moderate	Procedure area	Floors epoxy quartz, walls epoxy painted concrete block, ceilings epoxy painted solid-gypsum board.	Biosafety cabinet
[redacted]	[redacted]	Non-Human Primates	Minor, emergency	Isoflurane vaporizer, Gaymar warming pad	Light	Surgical/procedural support	Floors epoxy quartz, walls epoxy painted concrete block, ceilings epoxy painted solid-gypsum board. SS sinks. Fixed surgical lights.	Surgery lights Oxygen, medical air and gas evacuation
[redacted]	[redacted]	Rodent, pig	Survival, non-survival, emergency	Isoflurane vaporizer, ventilator	Light	Procedure area	Floors epoxy quartz, walls epoxy painted concrete block, ceilings epoxy painted solid-gypsum board. SS sinks. Fixed surgical lights.	surgery lights, Oxygen, medical air and gas evacuation
[redacted]	[redacted]	All	Surgical support	Instruments, medications surgical supplies	Moderate to heavy	Surgical support	Same as [redacted] SS sinks. No surgery lights.	Autoclave
[redacted]	[redacted]	All	Non-survival, survival, emergency	Vaporizer, ventilator, invasive/non-invasive monitoring, Gaymar warming pad, surgical lighting, fluid warmers	Moderate	Operating room	Epoxy painted CMU walls, epoxy painted drywall ceiling. Floors welded vinyl. Room lighting is recessed fluorescent fixtures. Fixed surgical lights.	Surgery lights, Oxygen, medical air and gas evacuation

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[redacted]	[redacted]		Surgical scrub Locker room for surgeons	Sinks	Moderate to heavy	Surgeons scrub	Same [redacted] Porcelain scrub sinks. No surgery lights.	Scrub sinks
[redacted]	[redacted]	All	Non-survival, survival, emergency	Vaporizer, ventilator, invasive/non-invasive monitoring, Gaymar warming pad, surgical lighting, fluid warmers, operating microscope	Moderate	Operating room	[redacted]	Surgery lights Oxygen, medical air and gas evacuation
[redacted]	[redacted]	All	survival	Behr hugger, Gaymar warming pad, small animal recovery unit	moderate	Post-op recovery	Floors are epoxy quartz, walls are epoxy painted concrete block, ceilings are epoxy painted solid-gypsum board.	Galvanized runs. Floor drains
[redacted]	[redacted]	All	survival	Plas Labs ICU small animal recovery unit; avian ICU/recovery unit	moderate	Post-op recovery	Same [redacted] No fixed surgery lights.	Oxygen, medical air and gas evacuation
[redacted]	[redacted]	All	Emergency, survival, non-survival		moderate	Animal preparation	Same [redacted]	Oxygen, medical air and gas evacuation
[redacted]	[redacted]	Rodent	Survival Non-survival	Vaporizer, Warming pad	Moderate	Lab	Epoxy painted CMU walls, epoxy painted drywall ceiling. Floors welded vinyl.	
[redacted]	[redacted]	rodent	Survival, non-survival	Warming pad	moderate	Lab	Epoxy painted CMU walls, epoxy painted drywall ceiling. Floors welded vinyl..	
[redacted]	[redacted]	Rodent	Survival, non-survival	Warming pad	moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodent	non-survival	Warming pad	moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodent	Survival Non-survival	Warming pad Vaporizer	Moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodent	Non-survival	Warming pad	Moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodents	Survival, non-survival	Vaporizer, warming pad, portable surgery lights	light	Operating room	Same as [redacted] No sink. No fixed surgical lights.	Oxygen
[redacted]	[redacted]	Rodents	Survival, non-survival	Vaporizer, warming pad, portable surgery lights	moderate	Operating room	Epoxy painted CMU walls, epoxy painted drywall ceiling. Floors welded vinyl. Room lighting recessed fluorescent fixtures. Fixed surgical lights. No sink.	Oxygen, Surgery lights
[redacted]	[redacted]	Rodents	Survival, non-survival	Vaporizer, warming pad, portable surgery lights	light	Operating room	Same as [redacted]. No sink.	Oxygen, Surgery lights
[redacted]	[redacted]	Rodents	Survival, non-survival		moderate	Lab	Walls are painted drywall, floors are vinyl tile, ceiling is drop-in acoustic tile, doors are sealed wood composite. Sinks.	
[redacted]	[redacted]	Rodent	Non-survival		Moderate	Lab	Walls are painted drywall, floors are vinyl tile, ceiling is drop-in acoustic tile, doors are sealed wood composite. Sinks.	

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[redacted]	[redacted]	Rodents	Survival, non-survival		moderate	Lab	[redacted]	
[redacted]	[redacted]	birds	Survival, non-survival	Vaporizer, warming pad,	moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodent	Survival, non-survival	Vaporizer, warming pad	moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodents	Survival, non-survival	Vaporizer, warming pad	moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodents	Survival, non-survival	Vaporizer, warming pad	Moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodents	Non-survival	Warming pad	Moderate	Lab	[redacted]	
[redacted]	[redacted]	Rodents	Non-survival	Warming pad	Light	Lab	[redacted]	
[redacted]	[redacted]	pigs	Non survival	Vaporizer, ventilator, invasive/non-invasive monitoring, Gaymar warming pad, surgical lighting, fluid warmers	light	surgery room	Epoxy painted sheetrock walls, acoustic ceiling tiles. Floors welded vinyl. Room lighting is recessed fluorescent fixtures. Fixed surgical lights.	Oxygen, medical air and gas evacuation
[redacted]	[redacted]	Rodent	Survival, non-survival	Vaporizer, warming pad	moderate	Procedure room	Floors are sealed epoxy quartz monolith. Walls and ceilings are painted drywall. Doors are painted hollow core metal. SS sinks.	
[redacted]	[redacted]	Rodent	Survival, non- survival	Vaporizer, warming pad	moderate	Procedure Room	[redacted]	
[redacted]	[redacted]	Rodent	Non-survival	Warming pad	moderate	Lab bench	[redacted]	
[redacted]	[redacted]	Rodent	Survival, non- survival	Vaporizer, warming pad	moderate	Surgery room	Floors are smooth troweled and sealed concrete. Walls are epoxy painted CMU. Ceilings are drop-in acoustic tile. Doors are painted metal (42" x 84").	

3. **Surgical Procedures** [*Guide*, pp. 117-118]

a. Describe the criteria used to differentiate major from minor survival surgery, including classification for certain procedures (e.g., laparoscopic technique).

The IACUC has a policy on multiple survival surgical procedures, which defines a major survival surgery as one that penetrates and exposes a body cavity, produces substantial impairment of physical or physiologic function, or involves extensive tissue dissection or transection. Examples of major surgical procedures include laparotomy, laparoscopy, intracranial cannulation or implants, nerve crush, laminectomy, etc

b. How is non-survival surgery defined?

Non-survival surgery is defined as a surgical procedure where the animal never regains consciousness once it is anesthetized and the animal is euthanized at the end of the procedure before recovery from anesthesia.

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4. Aseptic Technique [*Guide*, pp. 118-119]

a. Describe procedures, equipment, and protective clothing used for aseptic surgery. Include patient and surgeon preparation.

DCM aseptic surgery guidelines that include required procedures, equipment, and protective clothing are available on the IACUC website.

The surgeon's hands are disinfected by either chlorhexidine or povidone-iodine scrub.

All survival surgeries are conducted using aseptic technique, regardless of species. Hair and feathers are removed and skin is scrubbed with disinfectant. Surgeons wear scrubs, disposable gown or lab coat, mask and sterile gloves as a minimum for rodent and bird surgery; sterile gowns and head covers are also required for larger species. Instruments, surgical supplies and implantable materials must be sterile.

b. Describe methods used to sterilize instruments and protective clothing, including a description of approved liquid sterilants and instrument exposure time(s) required for each, if applicable.

Surgical instruments and gowns are initially autoclaved (one AUP is approved to use Cidex for overnight sterilization of delicate instruments). Other delicate supplies are sterilized with ethylene oxide or vaporized hydrogen peroxide (VHP). Sterilized disposable surgical supplies are available, i.e., gowns, drapes, table covers, gauze.

c. Describe methods for instrument re-sterilization between serial surgeries.

For rodent serial surgeries, glass bead sterilizers are used between each animal. Guidelines for using glass bead sterilizers can be accessed on the ECU IACUC website.

d. Indicate how effectiveness of sterilization is monitored.

Temperature indicators (tape or strips) are used in each autoclaved load. Biological indicators are used quarterly for autoclave, ethylene oxide and VHP to determine efficacy. Ethylene oxide indicators are on each peel pouch and indicator strips are in each VHP load.

e. Describe surgical support functions provided by the program to investigators.

Veterinary/surgical technicians and veterinarians are available for pre-, intra-, and post-operative care of animals, including anesthesia induction and

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maintenance. Veterinarians and veterinary/surgical technicians (under the supervision of a veterinarian) may also assist in and/or perform experimental surgeries upon investigator request.

5. **Intraoperative Monitoring** [*Guide*, p. 119]
Describe monitoring and recording requirements for each species, including the type of record(s) maintained. Also note monitoring of anesthesia during non-survival procedures.

DCM guidelines for intraoperative and intraprocedural monitoring are available on the IACUC website.

For survival procedures on rabbits, pigs and primates, individual surgical or procedural records include detailed intra-operative monitoring of physiologic parameters (BP, SPO2, HR, RR, temperature every 15-30 minutes), fluid type and volume, anesthetics, analgesics, and other drugs. This is documented by the DCM surgical staff.
Rodent or bird individual or group surgery monitoring includes information on procedure, anesthesia and analgesia, and any other relevant information recorded on the Procedure Monitoring Form (found on the IACUC website). PIs can also keep records in laboratory notebooks, but the notebooks must capture the same information as the Procedure Monitoring Form.

For non-survival surgeries on small animal species, anesthesia depth is monitored by toe pinch and visual monitoring of respiration. For non-survival procedures on large animal species, anesthesia depth is monitored by palpebral reflex, jaw tone and toe pinch, and analgesics are administered and recorded on a non-survival surgery record maintained by DCM surgical staff.

6. **Postoperative Care** [*Guide*, pp. 119-120]
Describe the postoperative care program, including who is responsible for overseeing and providing the care, types of records maintained (e.g., perioperative), where the records are maintained, etc.

For larger animals and rabbits undergoing survival procedures in the DCM surgical suites, postsurgical care is provided by DCM veterinary staff. Animals are recovered in a warm, dry environment (the intensive care recovery chamber in [redacted] and/or the postoperative recovery ward room in [redacted]) and observed continually until extubation. Once extubated, animals are monitored until sternal recumbency is observed. Observations may include general mentation, mucous membrane condition, and heart and respiratory rates/rhythms as indications of health and well-being. Depending on type and length of procedure, additional fluids, medications, analgesics, and monitoring (such as continuous EKG and SPO2) may be warranted and given in the immediate postoperative period. As the patient recovers further from anesthesia, additional monitoring parameters include

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appetite, presence or absence of urination and defecation, behavioral pain signs, signs of local or systemic infection, and surgery incision integrity. Bandaging and timely suture or staple removal is performed when required; suture or staple removal is routinely performed 7-14 days postoperatively. Detailed perioperative and postoperative records are maintained by the DCM surgical staff with veterinary oversight and the records are ultimately added to the medical record files kept by the surgery supervisor.

Rodent postoperative care is primarily provided by the PI laboratories, as these surgeries are usually performed in the animal procedure rooms or in the PI laboratories. Perioperative group or individual records are maintained by the investigators. Post-procedural/postoperative “yellow” cards as well as personal laboratory notebooks or logs are used to document rodent postoperative care by each investigator laboratory. These cards, available from DCM, are completed by the investigators and their lab personnel and remain with the animals on the cage during the postoperative period. A yellow procedure card power point tutorial on the IACUC website explains how the cards are used and completed. The cards document both daily observations (behavior, attitude, etc.), any treatments (analgesics, antibiotics, fluids, etc.) given, and the date and the person making observations or administering treatment. The yellow cards also alert DCM husbandry and veterinary staff that an animal procedure or surgery has been performed. When the postoperative period is concluded for that cage of animals, the cards are placed by research staff in a centrally located collection box and then filed by the veterinary technicians according to species, investigator and year. Some investigators perform rodent survival surgery procedures in the DCM surgical suite, typically with DCM surgical technician and/or veterinarian assistance. The investigator laboratory is responsible for their postoperative care after the animals recover from anesthesia.

E. Pain and Distress [*Guide*, pp. 120-121]

1. Describe how and by whom pain and distress are assessed.

The IACUC assigns a pain and distress category based on the USDA system to each AUP during the review process. The pain category reflects the most painful procedure in the AUP.

DCM animal technicians and research staff monitor the behavior of the animals, and when an abnormal behavior is noted, the veterinary staff is notified, and intervenes as appropriate.

2. Describe training programs for personnel responsible for monitoring animal well-being, including species-specific behavioral manifestations as indicators of pain and distress.

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The animal care technicians are trained in species-specific behavioral signs of pain and distress prior to working with the animals. Continuing education through PI presentations educate animal care technicians about specific animal studies. Researchers are also taught to recognize species-specific behavioral manifestations and the importance of frequent health monitoring during initial IACUC training, animal handling training, and surgery training.

F. Anesthesia and Analgesia [*Guide*, pp. 121-123]

1. List the agents used for each species.
Note: If preferred, this information may be provided in Table or additional Appendix.

Primates: tiletamine/zolazepam, ketamine, propofol, xylazine, isoflurane, buprenorphine, acetominophen, meloxicam

Pigs: tiletamine/zolazepam, xylazine, ketamine, midazolam, medetomidine, propofol, isoflurane, acepromazine, meloxicam, buprenorphine, tramadol, fentanyl patch, morphine

Rabbits: ketamine, xylazine, isoflurane, butorphanol, acepromazine, buprenorphine, meloxicam

Rodents: ketamine, xylazine, isoflurane, pentobarbital, tribromoethanol, ketorolac, buprenorphine, morphine, meloxicam, lidocaine, bupivacaine

Birds: isoflurane, equithesin, meloxicam, buprenorphine, lidocaine, bupivacaine

Amphibians and Fish: MS222, pramoxine, benzocaine, meloxicam, lidocaine

2. Describe how the veterinarian provides guidance and advice to researchers concerning choice and use of anesthetics, analgesics or other pain moderating methods.

The veterinarians pre-review AUPs and advise PIs on the most appropriate anesthetics and analgesics during AUP or amendment preparation. Veterinarians also review AUPs for convened IACUC meetings and as designated reviewers. They are frequently involved in ongoing assessments of animals and recommend/implement alternate pain medications and non-pharmacologic pain management to provide maximum relief to the animals.

3. Describe the monitoring of the effectiveness of analgesics, including who does the monitoring. Include in the description any non-pharmacologic means used to diminish pain and distress.

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DCM surgery technicians and veterinarians monitor PI animals when PIs use the DCM aseptic surgery facilities. This includes all aspects of anesthesia and analgesia. DCM veterinary technicians may provide anesthetics and analgesics for clinical use. Surgeries performed outside of DCM aseptic surgery facilities are generally monitored by PIs and their personnel. The IACUC monitors compliance with anesthetic and analgesic use during semi-annual inspections.

Non-pharmacologic means used to diminish pain and distress include quiet, warm, and darkened areas for anesthetic and procedural recovery; providing hiding places; appropriate wound or bandage care/maintenance; providing soft bedding or a resting surface; use of oral rehydration fluids, gel water and diets; use of soft diet and other palatable foods; and longer sipper tubes and placement of food on the cage floor to allow ease of access to food and water.

4. Describe how the veterinarian(s) and the IACUC/OB evaluate the proposed use of neuromuscular blocking agent to ensure the well-being of the animal.

Veterinarians pre-review and the IACUC reviews AUPs with neuromuscular blocking (NMB) agent use. A specific section of the AUP including scientific justification must be completed for NMB agent use. The agent is only used on anesthetized animals and appropriate monitoring procedures must be described for its use. In addition, the PI must also describe in the AUP what will be done when monitoring parameters indicate that an animal is experiencing pain under neuromuscular blockade.

5. Describe policies and practices for maintaining and ensuring function of equipment used for anesthesia.

DCM anesthetic vaporizers are calibrated and serviced annually by an outside contractor. The surgery supervisor coordinates this and alerts PIs so they can include their vaporizers as well. Vaporizers, hoses, and bellows are checked prior to use. F/Air or other charcoal canisters are weighed initially to determine the starting weight and then after each use. The canister is discarded when the weight reaches 50g above the initial weight. Integrity of DCM anesthetic machines is assessed before each procedure to ensure proper gas flow and delivery.

SOPs are in place for use and maintenance of monitoring equipment which is used during anesthesia and surgery procedures

G. Euthanasia [*Guide*, pp. 123-124]

1. Describe approved methods of euthanasia, including humane slaughter (for additional guidance, see pertinent AAALAC Reference Resources). Include:

- consideration of species, age, condition (e.g., gestational period, or neonatal) and

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- location(s) for the conduct of the procedure.

Note: If preferred, this information may be provided in Table or additional Appendix.

The IACUC uses the 2013 AVMA's *Guidelines for the Euthanasia of Animals*.

Typically, rabbits, pigs, reptiles, and non-human primates are euthanized by barbiturate overdose under general anesthesia or sedation. In some protocols, pigs are euthanized by potassium chloride overdose while under deep surgical anesthesia, so that carcass decomposition studies in an open field can be conducted without environmental contamination.

Acceptable methods for euthanasia of rats and mice include carbon dioxide or isoflurane overdose followed by a secondary physical method or a combination of secondary physical methods; barbiturate overdose; and exsanguination, cervical dislocation and/or decapitation under anesthesia. Decapitation or cervical dislocation without anesthesia in these species is permitted but must be scientifically justified and approved by the IACUC.

Late stage rodent embryos and neonates can be euthanized by isoflurane or carbon dioxide sedation or anesthesia followed by decapitation, or decapitation without prior sedation or anesthesia for neonatal rodents <7 days old.

In fish and amphibians, euthanasia by overdose with buffered tricaine methanesulfonate (MS222) is preferred. A 7.5% or 20% benzocaine gel applied to the ventrum (typically for small species of frogs) or the dorsal head of salamanders followed by a secondary physical method is acceptable. Fish and amphibians in certain field studies can be euthanized by decapitation followed by pithing or double pithing(amphibians). Fish cervical transection followed by pithing or pithing alone may also be used. In tropical and subtropical, sternothermic fish species, such as zebrafish, euthanasia by immersion in ice-chilled water is permitted. Gobies and other small benthic fish can be decapitated followed immediately by gill arch snipping to exsanguinate fish or eugenol sedation followed by overdose. Fish can also be euthanized by using electronarcosis followed by a physical method, with strong scientific justification and IACUC approval.

Embryonic and larval fish are euthanized by immersion in ice-chilled water followed by sodium or calcium hypochlorite solution.

If a cephalopod is injured (as bycatch), it will be euthanized by immersion in a 7.5% magnesium chloride solution.

Birds are generally euthanized by barbiturate overdose, isoflurane overdose followed by a secondary physical method, or decapitation, cervical dislocation, or exsanguination under anesthesia. Decapitation without anesthesia and thoracic

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compression under anesthesia must be scientifically justified and approved by the IACUC.

Finch egg euthanasia follows AVMA guidelines: eggs greater than 50% incubation are euthanized by inhalant anesthetic overdose and eggs less than 50% incubation are euthanized by cooling <4 degrees Celsius for 4 hours or freezing, with the first situation followed by a secondary physical method.

Euthanasia procedures are performed in a location separate from the animal housing room. CO2 chambers are located in procedure spaces in [redacted], [redacted]

2. Describe policies and practices for maintaining and ensuring function of equipment used for euthanasia.

CO2 tanks are checked prior to use to ensure that adequate CO2 is present. The IACUC has a policy for guillotine and sharps/scissors maintenance, available on the IACUC website. A log must be maintained; this is reviewed during semi-annual IACUC inspections.

DCM personnel follow SOP 1034 for carbon dioxide euthanasia of rodents. Signage is posted on the wall just above the equipment for proper use of the carbon dioxide delivery systems. Compressed gas cylinders deliver CO2 via a regulator to a chamber or cage, preferably to the animal's home cage.

The Euthanex system settings allow the delivery of CO2 by species and age, through preset displacement and dwell times, with the animals in their home cages inside the Euthanex chamber. CO2 is actively purged at the end of the cycle. Instructions for use are posted be the Euthanex chambers.

The flow rate for CO2 chambers is set to displace 10-30% of the cage volume/minute.

With either system, animals are visually inspected for absence of movement and respiration prior to removal from the cage and a secondary physical method is used to ensure death.

3. Describe the methods used to confirm death of an animal.

Generally, death in large animal species after being given a euthanasia dose of pentobarbital is confirmed by auscultation or direct palpation to ensure the cessation of a heartbeat and breathing.

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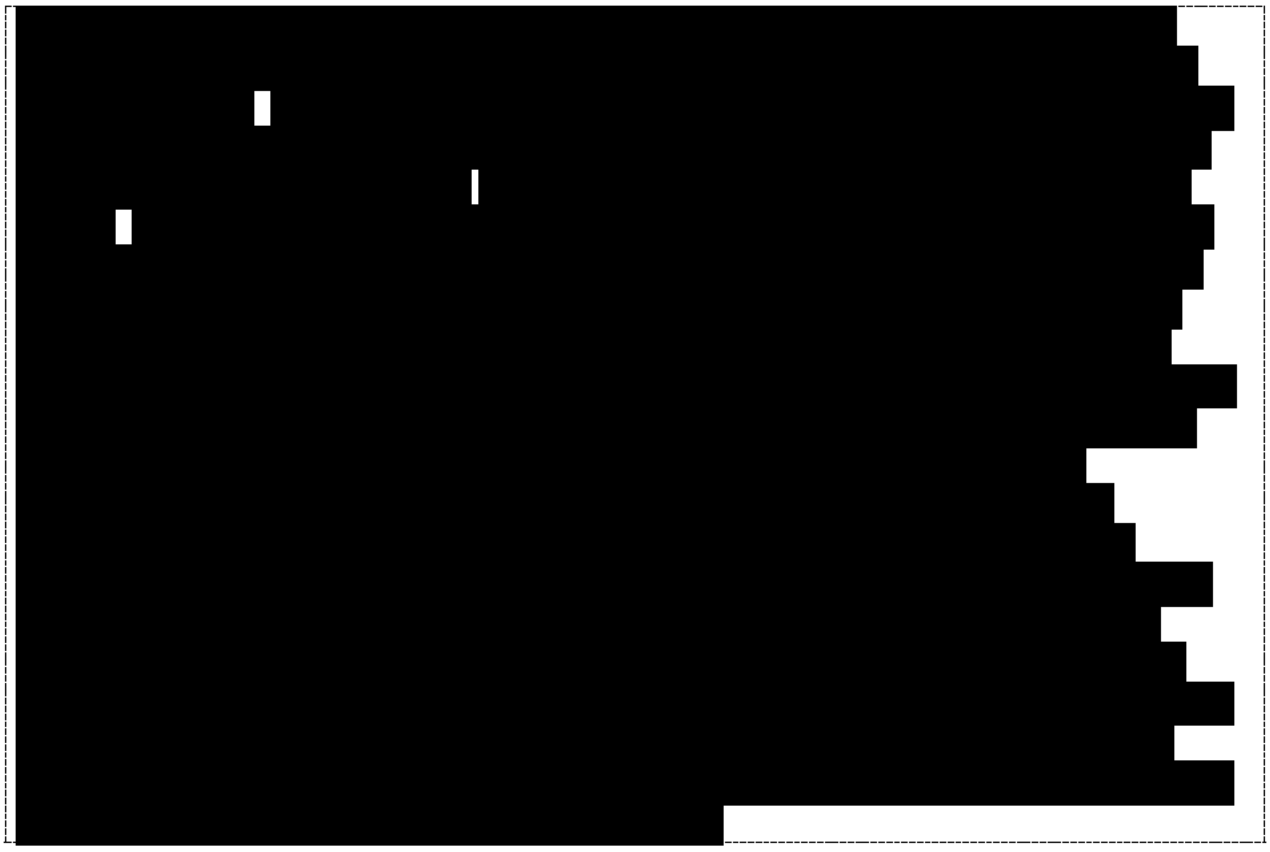
Other species are confirmed dead by a secondary physical method such as exsanguination, thoracotomy or pneumothorax, cervical dislocation or transection, decapitation, and pithing (single or double).

IV. Physical Plant [*Guide*, pp. 133-155]

A. Facilities Overview

Provide a brief introduction to the animal housing and use facilities. Note that this overview should augment the information provided in **Appendix 2** (Summary of Animal Housing and Support Sites), which includes area, average daily census, and person responsible for each site. Please use consistent terminology for the buildings/areas/sites described in the Location section of the Appendix. Please do not repeat information, but supplement the descriptions provided elsewhere to assist the reviewers understanding of the interaction between facilities, special housing locations, and separate procedural areas.



B. Centralized (Centrally-Managed) Animal Facility(ies)

In this section, describe each centralized or centrally-managed animal housing and use facility. Include in **Appendix 3** the floor plans of each on 8.5" x 11" or A4 paper. Ensure that the drawings are legible and the use of each room is indicated (animal housing, procedure room, clean cage storage, hazardous waste storage, etc.). Note that a separate section for describing "satellite housing areas" is included below.

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Separately describe **each** Location or Animal Facility, addressing each of the features outlined below (1-8). A complete description of each must be provided; however, common features among locations or facilities may be indicated as such and do not need to be repeated.

1. General arrangement of the animal facilities (conventional, clean/dirty corridor, etc.).
2. Physical relationship of the animal facilities to the research laboratories where animals may be used.
3. Types of available animal housing spaces used, such as conventional, barrier, isolation/quarantine, hazard containment (infectious, radioactive, chemical), “animal cubicles” or facilities specifically designed for housing certain species such as ponds, pastures, feedlots, etc.
4. Finishes used throughout the animal facility for floors, walls, ceilings, doors, alleyways, gates, etc. (note any areas that are not easily sanitized and describe how these are maintained).
5. Engineering features (design, layout, special HVAC systems, noting exhaust air treatment, if applicable) used in hazardous agent containment.
6. Security features, such as control of entry, perimeter fences, gates, entryways, cameras, guards; identify and describe exceptions for individual facilities or areas incorporating fewer or additional security features than the general features described.
7. Consideration for facilities with exterior windows, if applicable, including management of environmental conditions (i.e., temperature and photoperiod control) and potential security risks.
8. Storage areas for flammable or hazardous agents and materials (e.g., disinfectants, cage-washing chemicals, pesticides, fuel).

[redacted] are primarily conventional. [redacted] Throughout the facility, floors are epoxy quartz, walls are epoxy painted concrete block, and ceilings are epoxy painted solid-gypsum board. Doors are 42" x 84", enamel painted metal, most with view panels. [redacted]

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[redacted] is primarily conventional. [redacted] Facility floors are epoxy quartz, walls are epoxy painted concrete block, ceilings are epoxy painted solid-gypsum board. Doors 42" x 84", enamel painted metal, covered view panel. There are no exterior windows in the [redacted]

[redacted] housing is conventional. [redacted] Floors are sealed epoxy quartz monolith. Walls and ceilings are painted drywall. Doors are painted hollow core metal. [redacted] There are no exterior windows in the animal facility. [redacted]

[redacted] This facility is [redacted]. Laboratory space is open and adjacent to the animal facility. Floors are sealed epoxy quartz monolith. Walls and ceilings are painted drywall. Doors are painted hollow core metal. There are no windows or cagewash facilities in this small rodent holding and procedure space. [redacted]

[redacted])
Animal facility is conventional, with laboratory and procedure space located in the same area as animal holding. Floors are smooth troweled and sealed concrete. Walls are epoxy painted CMU. Ceilings are drop-in sanitizable acoustic tile. Doors are painted metal (42" x 84"). There are no windows or cagewash facilities in [redacted]

C. Satellite Animal Housing Facilities

In addition to the Appendices summarizing Heating, Ventilation, and Air-Conditioning (**Appendix 11**) and Lighting Systems (**Appendix 16**), summarize animal housing areas that are not centrally-managed or maintained in (**Appendix 17)**, "Satellite Animal Housing Areas."

1. Describe the criteria used to determine/define a "Satellite Animal Housing Area," which may include remote housing facilities or laboratories temporarily or consistently housing animals.

Any holding or animal housing area where animals are held greater than 12 hours at ECU that is not Department of Comparative Medicine – maintained vivarium will be designated as a satellite facility.

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2. Describe the process used by the IACUC/OB to authorize, provide oversight of, and ensure compliance with *Guide* standards for the housing of animals outside of centrally-maintained facilities. Include a description of Attending Veterinarian access and physical security.

ECU IACUC has established guidelines for Satellite Animal Facilities including the process to obtain a DCM/IACUC approved satellite facility and how the animal should be cared for and how the facility should be maintained by the investigators. Investigators can access this guideline through the IACUC website. Briefly, to obtain approval as a satellite facility, investigators must fill out the application, including justification and required facility information. The application can then be submitted to the IACUC for review. If the IACUC approves the facility justification, the investigator must arrange an initial inspection of the proposed site. Both IACUC and DCM representatives must be included in the initial inspection. During the inspection, representative will help identify any potential problematic issues and recommend changes needed. The facility may be approved, require a re-inspection, or denied satellite facility status. It is the responsibility of the PI to ensure that all regulations, guidelines, and institutional rules are implemented within the satellite facility. This covers the care and use of all animals seven days a week. Appropriate PPE, signage, and caging for all animal housing in the facility must be adhered to. [redacted] The Attending Veterinarian and veterinary staff as well as the IACUC have access to satellite facilities. Failure to meet all required expectations will result in loss of Satellite Animal Facility status.

D. Emergency Power and Life Support Systems

Note: Complete a Heating, Ventilation, and Air-Conditioning (HVAC) Summary (**Appendix 11**) and Lighting Summary (**Appendix 16**) for each Location described in the Summary of Animal Housing and Support Sites (**Appendix 2**).

1. **Power** [*Guide*, p. 141]
   For each Location, Centralized Animal Facility, and Satellite Housing Facility, provide a brief description of the following:
   - Availability of emergency power and if so, what electrical services and equipment are maintained in the event the primary power source fails.
   - History of power failures, noting frequency, duration, and, if emergency power was not available, steps taken to ensure the comfort and well-being of the animals present and the temperature extremes reached in animal rooms during the failure.

[redacted]
The Emergency Power Supply System (EPSS) for [redacted] is a Level 1, Class X, Type 10 system. It is served by a single diesel-powered generator set. It is a 749Hp, 500kW unit. It has an integral belly tank which holds approximately 500 gallons of

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fuel. It is currently only loaded to 42% and will run approximately 20 hours before requiring refueling. Transfer between normal utility power and the EPSS is accomplished through a single automatic transfer switch (ATS). The ATS is a closed transition switch with isolation by-pass. This mitigates the “blip” that is typical when switching between sources for testing. Additionally, with the by-pass isolation, the switch can be inspected or maintained without having to de-energize the supplies. The unit is inspected and tested weekly and run under load monthly. Besides the emergency and legally required standby loads, optional standby loads such as the air handling units, chilled water pumps, domestic water pumps, lighting, and equipment plugged into “Red” outlets are also on the EPSS. This allows critical equipment needed to maintain environmental conditions to operate in the event of a loss of normal power to the building. The reliability of the local utilities company is excellent and in last 3 years, there have been no extended power failures or a failure of the EPSS to come up and on line within the required 10 seconds. The generator set is monitored continuously 24/7 through a third-party automated monitoring system. Any alarm conditions on the generator will trigger a text message being sent to the “on-call” technician and well as an email. The technician would then mobilize to campus to investigate.

[redacted] **Animal Facility**

The Emergency Power Supply System (EPSS) for [redacted] is a Level 1, Class X, Type 10 system. It is served by three diesel-powered generator sets, paralleled together. Gen1: is a 589Hp/500KW unit, Gen2 is a 998Hp/650KW unit and Gen3 is an 892Hp/600KW unit. All the units are less than 50% loaded giving the EPSS N+1 redundancy. Each unit has a day tank which connects to an underground storage tank. This provides approximately 1400 gallons of fuel per genset. It will run approximately 64 hours before requiring refueling. Transfer between normal utility power and the EPSS is accomplished through multiple automatic transfer switches (ATSs). The EPSS is inspected and tested weekly and run under load monthly. Besides the emergency and legally required standby loads, optional standby loads such as the air handling units, chilled water pumps, domestic water pumps, lighting, and equipment plugged into “Red” outlets are also on the EPSS. This allows critical equipment needed to maintain environmental conditions to operate in the event of a loss of normal power to the building. The reliability of the local utilities company is excellent and in last 3 years, there have been no extended power failures or a failure of the EPSS to come up and on line within the required 10 seconds. The generator set is monitored continuously 24/7 through a third-party automated monitoring system. Any alarm conditions on the generator will trigger a text message being sent to the “on-call” technician and well as an email. The technician would then mobilize to campus to investigate.

[redacted] **Animal Facility**

The Emergency Power Supply System (EPSS) for [redacted] is a Level 1, Class X, Type 10 system. It is served by a single diesel-powered generator set. It is a 1356Hp, 1250kW unit. It has an integral belly tank which holds approximately 600

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gallons of fuel. It is currently only loaded to 16% and will run approximately 33.4 hours before requiring refueling. Three facilities are served by this single generator set: [redacted]. Transfer between normal utility power and the EPSS is accomplished through a multiple automatic transfer switches (ATS) located at each facility. The unit is inspected and tested weekly and run under load monthly. Besides the emergency and legally required standby loads, [redacted] has other optional standby loads equipment plugged into "Red" outlets are also on the EPSS. This facility does not have HVAC equipment on the EPSS and therefore cannot maintain environmental conditions in the event of a loss of normal power to the building. The reliability of the local utilities company is excellent and in last 3 years, there have been no extended power failures or a failure of the EPSS to come up and on line within the required 10 seconds. The generator set is monitored continuously 24/7 through a third-party automated monitoring system. Any alarm conditions on the generator will trigger a text message being sent to the "on-call" technician and well as an email. The technician would then mobilize to campus to investigate.

[redacted] Animal Facility

The Emergency Power Supply System (EPSS) for [redacted] is a Level 1, Class X, Type 10 system. It is served by a single diesel-powered generator set. The gen set is a 1214Hp/750KW unit. The unit is 15% loaded. The unit has an integral belly tank which holds approximately 2200 gallons of fuel. It will run approximately 41 hours before requiring refueling. Transfer between normal utility power and the EPSS is accomplished through a multiple automatic transfer switches (ATSs). The EPSS is inspected and tested weekly and run under load monthly. Besides the emergency and legally required standby loads, optional standby loads such as the air handling units, chilled water pumps, domestic water pumps, lighting, and equipment plugged into "Red" outlets are also on the EPSS. This allows critical equipment needed to maintain environmental conditions in the animal facility to operate in the event of a loss of normal power to the building. The reliability of the local utilities company is excellent and in last 3 years, there have been no extended power failures or a failure of the EPSS to come up and on line within the required 10 seconds. The generator set is monitored continuously 24/7 through a third-party automated monitoring system. Any alarm conditions on the generator will trigger a text message being sent to the "on-call" technician and well as an email. The technician would then mobilize to campus to investigate

[redacted] Animal Facility

The Emergency Power Supply System (EPSS) for [redacted] is a Level 1, Class X, Type 10 system. It is served by a single diesel-powered generator set. The gen set is a 132Hp/90KW unit. The unit is 8% loaded. The unit has an integral belly tank which holds approximately 250 gallons of fuel. It will run approximately 60 hours before requiring refueling. Transfer between normal utility power and the EPSS is accomplished through a single automatic transfer switch (ATS). The EPSS is inspected and tested weekly and run under load twice a month. Besides

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the emergency and legally required standby loads, optional standby loads such as equipment plugged into "Red" outlets are also on the EPSS. The HVAC system is not on the EPSS and therefore environmental conditions cannot be maintained during a loss of normal power. The reliability of the local utilities company is excellent and in last 3 years, there have been no extended power failures or a failure of the EPSS to come up and on line within the required 10 seconds. The generator set is monitored continuously 24/7 by ECU Police through the fire alarm system. Any alarm conditions on the generator will trigger an ECU dispatch contacting the "on-call" technician. The technician would then mobilize to campus to investigate

[redacted] **Animal Facilities**
The Emergency Power Supply System (EPSS) for [redacted] is a Level 1, Class X, Type 10 system. They are served by a single diesel-powered generator set. The gen set is a 220Hp/150KW unit. The unit is 43% loaded. The unit has an integral belly tank which holds approximately 400 gallons of fuel. It will run approximately 65 hours before requiring refueling. Transfer between normal utility power and the EPSS is accomplished through a two automatic transfer switches (ATSs), one for Emergency and a second for optional standby loads. The HVAC system is not on the EPSS and therefore environmental conditions cannot be maintained during a loss of normal power. The EPSS is inspected and tested weekly and run under load twice a month. Besides the emergency and legally required standby loads, optional standby loads such as equipment plugged into "Red" outlets are also on the EPSS. The reliability of the local utilities company is excellent and in last 3 years, there have been no extended power failures or a failure of the EPSS to come up and on line within the required 10 seconds. The generator set is monitored continuously 24/7 by ECU Police through the fire alarm system. Any alarm conditions on the generator will trigger an ECU dispatch contacting the "on-call" technician. The technician would then mobilize to campus to investigate
emergency power is available and serves lighting and red electrical outlets

Zebrafish racks at all locations are connected to sensaphone systems, to notify personnel if there are localized power failures within facilities. These systems are in all [redacted] satellite facilities.

2. **Other System Malfunctions.** If not previously reported, describe animal losses or health problems resulting from power, HVAC, or other life support system (e.g., individually ventilated cages) failures, and mechanisms for reporting such incidences. AAALAC International Rules of Accreditation (Section 2.f).

Prior to moving into [redacted] was designated as approved satellite housing for the [redacted] naked goby lab. However, in fall of 2017 the room experienced a partial power failure that resulted in the death of naked goby fish.

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Subsequently, [redacted] was assigned to the [redacted] for housing fish, all remaining fish were relocated there, and sensaphone systems have been installed.

E. Other Facilities [*Guide*, pp. 144, 150]

1. Other Animal Use Facilities [*Guide*, pp. 146-150]

Describe other facilities such as imaging, irradiation, and core/shared behavioral laboratories or rooms. Include a description of decontamination and methods for preventing cross-contamination in multi-species facilities.

N/A

2. Other Animal Program Support Facilities

Describe other facilities providing animal care and use support, such as feedmills, diagnostic laboratories, abattoirs, etc.

N/A

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According to the privacy principles on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, we wish to advise you that the personal data in the Program Description will become part a permanent file owned by AAALAC International, and that can be shared with AAALAC International offices and representatives in order to perform an evaluation of the institution´s animal care and use program and provide accreditation services. The institution has the option of exercising rights of data access, rectification, cancellation, and opposition at: accredit@aaalac.org

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Appendix 1: Glossary of Abbreviations and Acronyms

Please provide a Table defining abbreviations and acronyms used in this Program Description.

Abbreviation/Acronym	Definition
AAALAC	AAALAC, International
AALAS	American Association of Laboratory Animal Science
ABSL3	Animal Biological Safety Level 3
AHU	Air Handling Unit
ALAT	Assistant Laboratory Animal Technician
APV	Association of Primate Veterinarians
ARAV	Association of Reptilian and Amphibian Veterinarians
ASLAP	American Society of Laboratory Animal Practitioners
AUP	Animal Use Protocol
AVMA	American Veterinary Medical Association
AV	Attending Veterinarian
BA	Bachelor of the Arts
BAS	Building Automation System
BP	Blood pressure
BS	Bachelor of Science
BSL2	Biological Safety Level 2
BSO	Biological Safety Officer
[redacted]	[redacted]
CCAC	Canadian Council on Animal Care
CDC	Center for Disease Control
CMU	Concrete Masonry Units
CO2	Carbon Dioxide
CRL	[redacted]
DACLAM	Diplomate, American College of Laboratory Animal Medicine
DCM	Department of Comparative Medicine
DEET	N,N-Diethyl-meta-toluamide
DHHS	Department of Health and Human Services
DOD	Department of Defense
DVM	Doctor of Veterinary Medicine

Appendix 1: Glossary of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
EAE	Experimental autoimmune encephalomyelitis
[redacted]	[redacted]
ECU	East Carolina University
ED	Emergency Department
EH&S	Environmental Health and Safety
EKG	Electrocardiogram
[redacted]	[redacted]
HCAS	Thomas Harriot College of Arts and Sciences
HEPA	High-Efficiency Particulate Air
HR	Heart rate
HSC	Health Sciences Campus
IACUC	Institutional Animal Care and Use Committee
IACUC/OB	Institutional Animal Care and Use Committee/Oversight Body
IBC	Institutional Biosafety Committee
IO	Institutional Official
IVC	Individual ventilated caging
IVCS	Individual Ventilated Caging System
IVIS	In vivo imaging system
JIT	Just In Time
LAA	Laboratory Animal Allergies
LAT	Laboratory Animal Technician
[redacted]	[redacted]
MRI	Magnetic resonance imaging
MPH	Master of Public Health
MS	Master of Science
MSEE	Master of Science Degree in Electrical Engineering
MSMR	Massachusetts Society for Medical Research
NABR	National Association for Biomedical Research
NCABR	North Carolina Association for Biomedical Research
NCALAM	North Carolina Academy of Laboratory Animal Medicine
NCSU	North Carolina State University

Appendix 1: Glossary of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
NHP	Non-Human primate
NIOSH	National Institute for Occupational Safety and Health
NIH	National Institutes of Health
NMB	Neuromuscular blocking
NRC	National Research Council
NSF	National Science Foundation
OHSP	Occupational Health & Safety Program
OLAW	Office of Laboratory Animal Welfare
PAPRs	Powered Air Purifying Respirator
PCR	Polymerase chain reaction
PhD	Doctor of Philosophy
PHS	Public Health Service
PI	Principal Investigator
PPE	Personal Protective Equipment
REDE	Research Economic Development and Engagement
RLATG	Registered Laboratory Animal Technologist
RLAT	Registered Laboratory Animal Technician
RO	Responsible Official
RR	Respiratory rate
SCARB	Scavenger receptor BI mouse
SCID	Severe combined immunodeficiency
[redacted]	[redacted]
SOP	Standard Operating Procedure
SPF	Specific pathogen free
SPO2	Peripheral oxygen saturation
TB	Tuberculin
TSE	Phenomaster metabolic caging system
USDA	U.S. Department of Agriculture
USFWS	United States Fish and Wildlife Service
VC	Vice Chancellor
VVC	Veterinary Verification and Consultation
[redacted]	[redacted]
[redacted]	[redacted]

Appendix 2: Summary of Animal Housing and Support Sites

Briefly summarize in the following Table the animal facility or facilities, noting the number of areas in which animals are housed (buildings, floors, farms, satellite housing facilities, etc.), the total square footage/metres (or acreage) for animal care and use, and the total square footage/metres (or acreage) for necessary support of the animal care and use program covered by this Description (water treatment plant/area if housing aquatic or amphibian species, cagewashing facilities, service corridors, etc. and additional areas to be considered are enumerated in the *Guide*). Detailed information for satellite housing facilities is requested in Appendix 17. Include only one line entry for satellite housing facilities in this table to provide the total square footage for all satellite housing areas listed in appendix 17. If more than one facility/site, note the approximate distance (yards/miles or meters/kilometers) to each facility from a reference point such as from the largest animal facility. A campus/site map (with a distance scale) may be included as an additional Appendix (Appendix 2.1) to provide this information. See Instructions, Addendum A - Animal Facility Square Footage/Meters Compilation Form for guidance in calculating the size of your animal care and use program.

Animal Housing and Support Sites						
Location (building, site, farm name, etc.[a])	**Distance from main facility[b]**	**Approx. ft^2, m^2, or acreage for animal housing**	**Approx. ft^2, m^2, or acreage for support or procedures**	**Species housed**	**Approx. Daily Animal Census by species**	**Person in charge of site**
[redacted]	[redacted]	[redacted]	[redacted]	Rodents, Rhesus macaques, pigs	Mice 1746 Rhesus 20 Pigs 1	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	Rodents, finches, zebrafish	Rats 17 Mice 1630 Finches 222 Zebrafish 75	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	Rodents	Mice 329	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	Rodents	0	
[redacted]	[redacted]	[redacted]	[redacted]	Rodents	Mice 52	

Appendix 2: Summary of Animal Housing and Support Sites

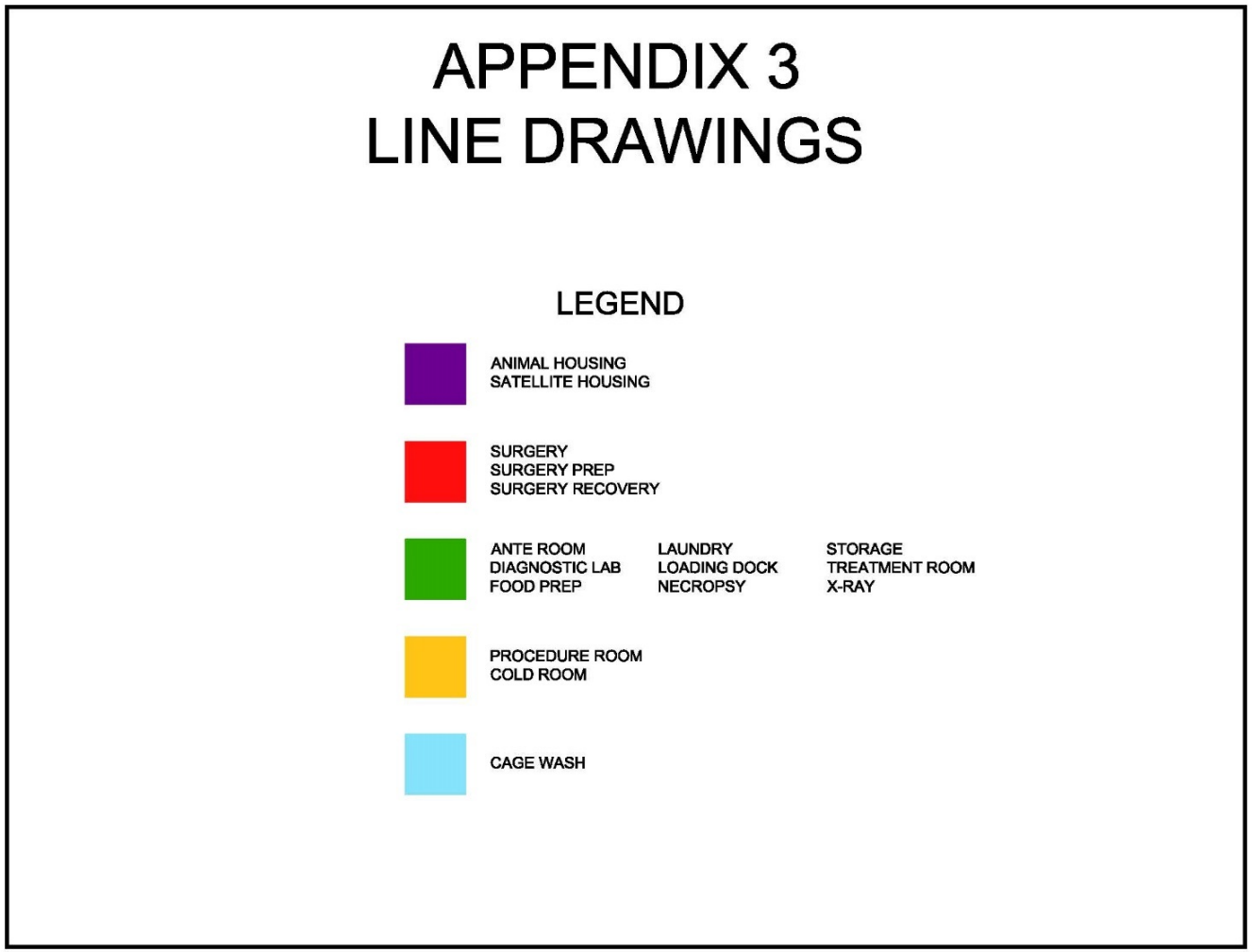
Animal Housing and Support Sites						
Location (building, site, farm name, etc.[a])	**Distance from main facility[b]**	**Approx. ft², m², or acreage for animal housing**	**Approx. ft², m², or acreage for support or procedures**	**Species housed**	**Approx. Daily Animal Census by species**	**Person in charge of site**
[redacted]	[redacted]	[redacted]	[redacted]	Fish, frogs	Stickleback 13 Zebrafish 4,944 Gobies 30 Poison Dart Frogs 185	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	Birds	Finches 115	[redacted]
[redacted]	[redacted]	[redacted]	same	Fish, frogs	0	[redacted]
Satellite Housing Facilities Total (Expand in Table 17)		[redacted]	same			

Totals:	[redacted]	
Total animal housing and support space:	[redacted] **(please specify ft² or m²)**	

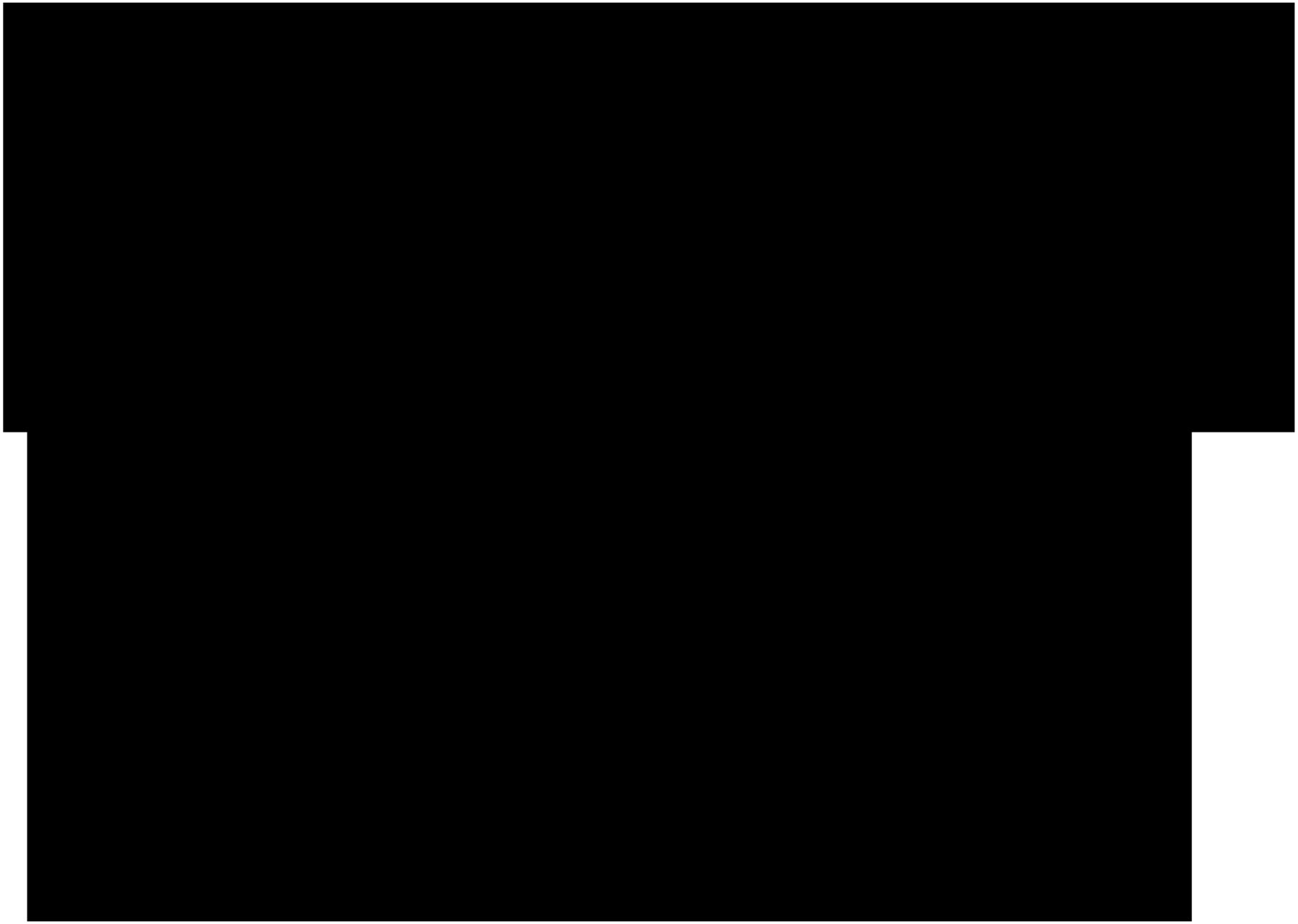
[a]Please state name and/or use acronyms described in **Appendix 1** for building names, if not coded for confidentiality.
[b]Campus or site map(s) may also be provided in lieu of this information.

Appendix 3: Line Drawings

Provide floor plans of each centralized animal housing facility. Plans should be provided on 8.5” x 11” or A4 paper. Ensure that the drawings are legible, including room numbers if used, and the use of each room is indicated (animal housing, procedure room, clean cage storage, hazardous waste storage, etc.) either directly on the drawing or in a Key/Table.



Appendix 3: Line Drawings



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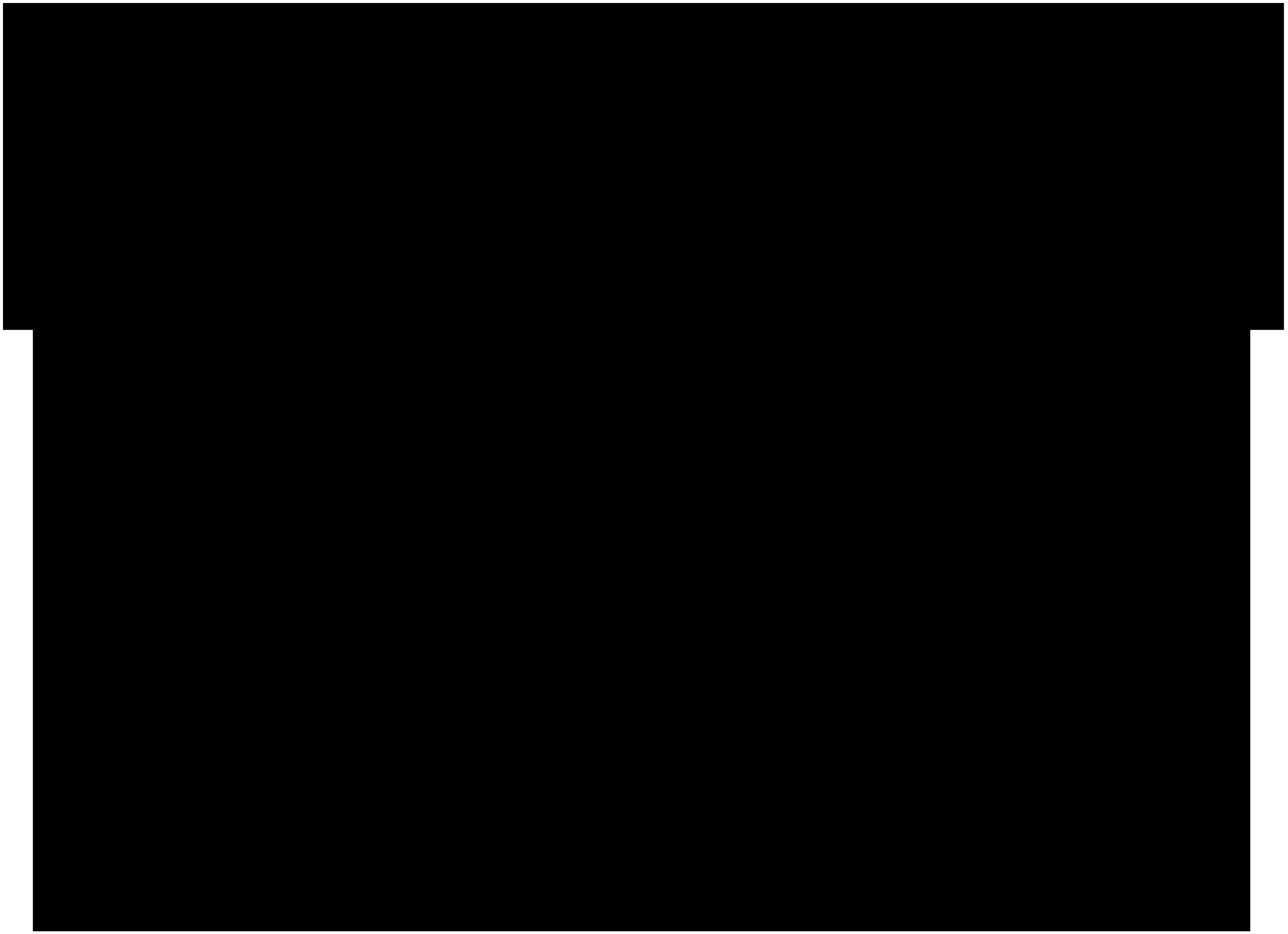

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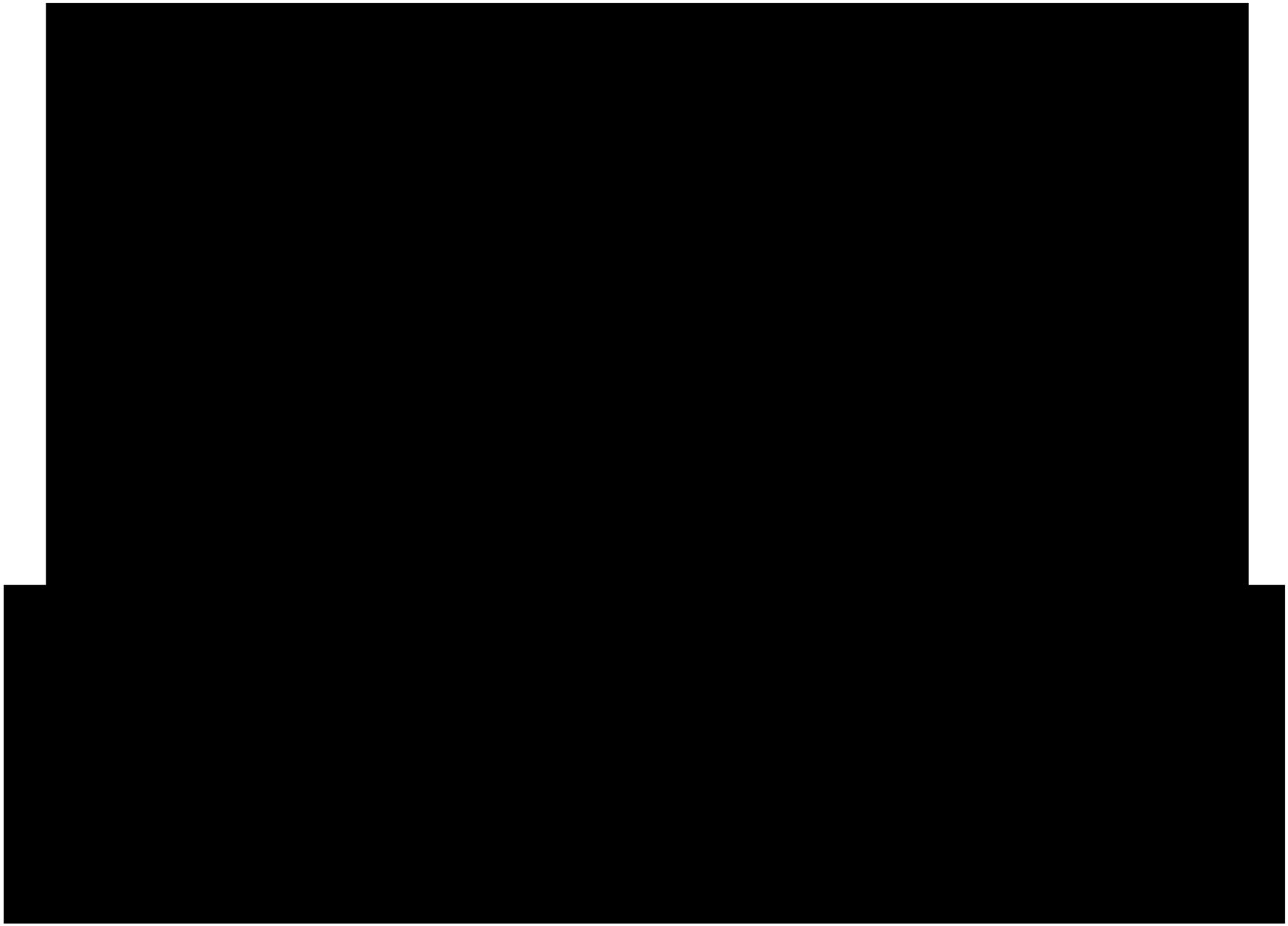

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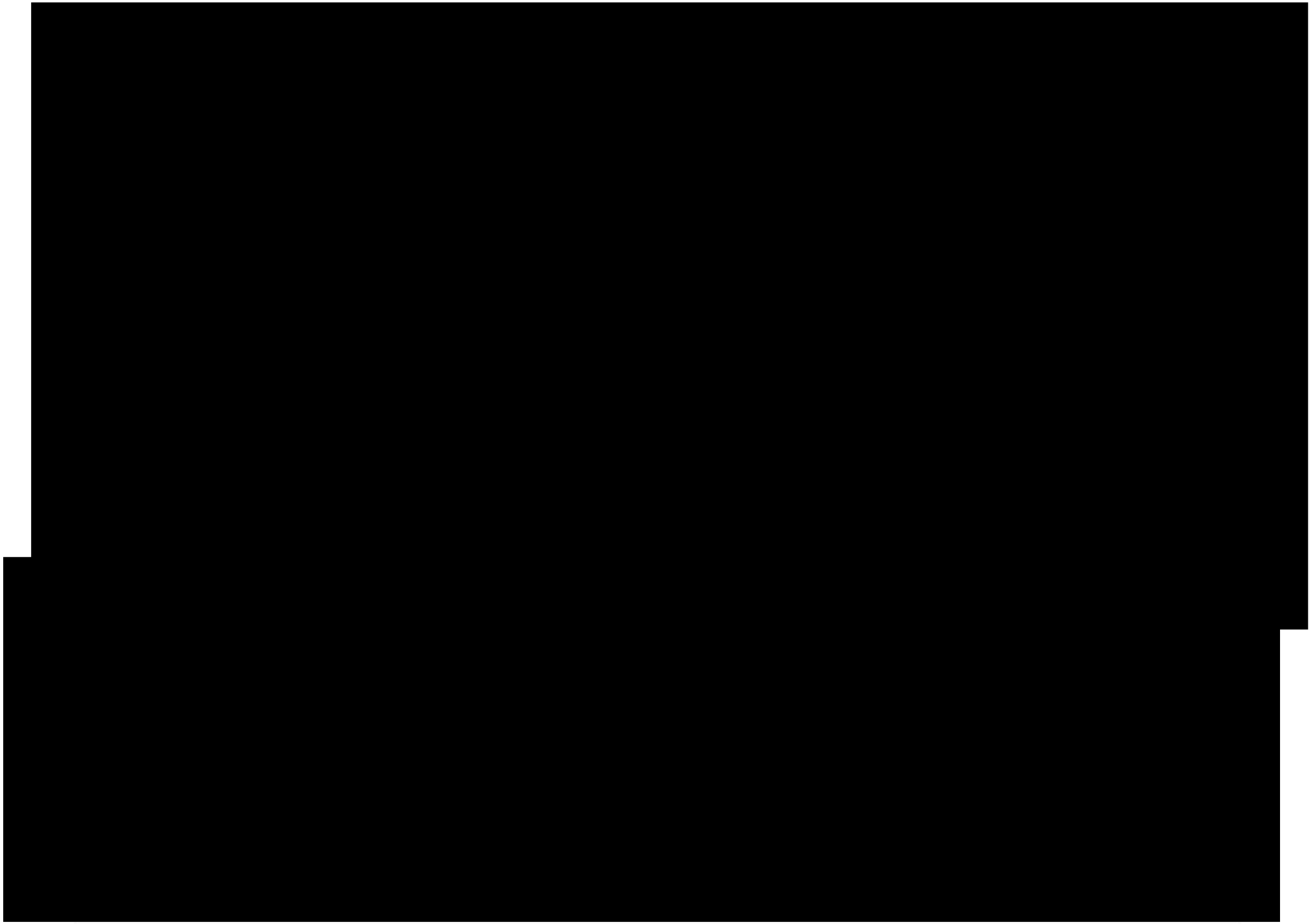

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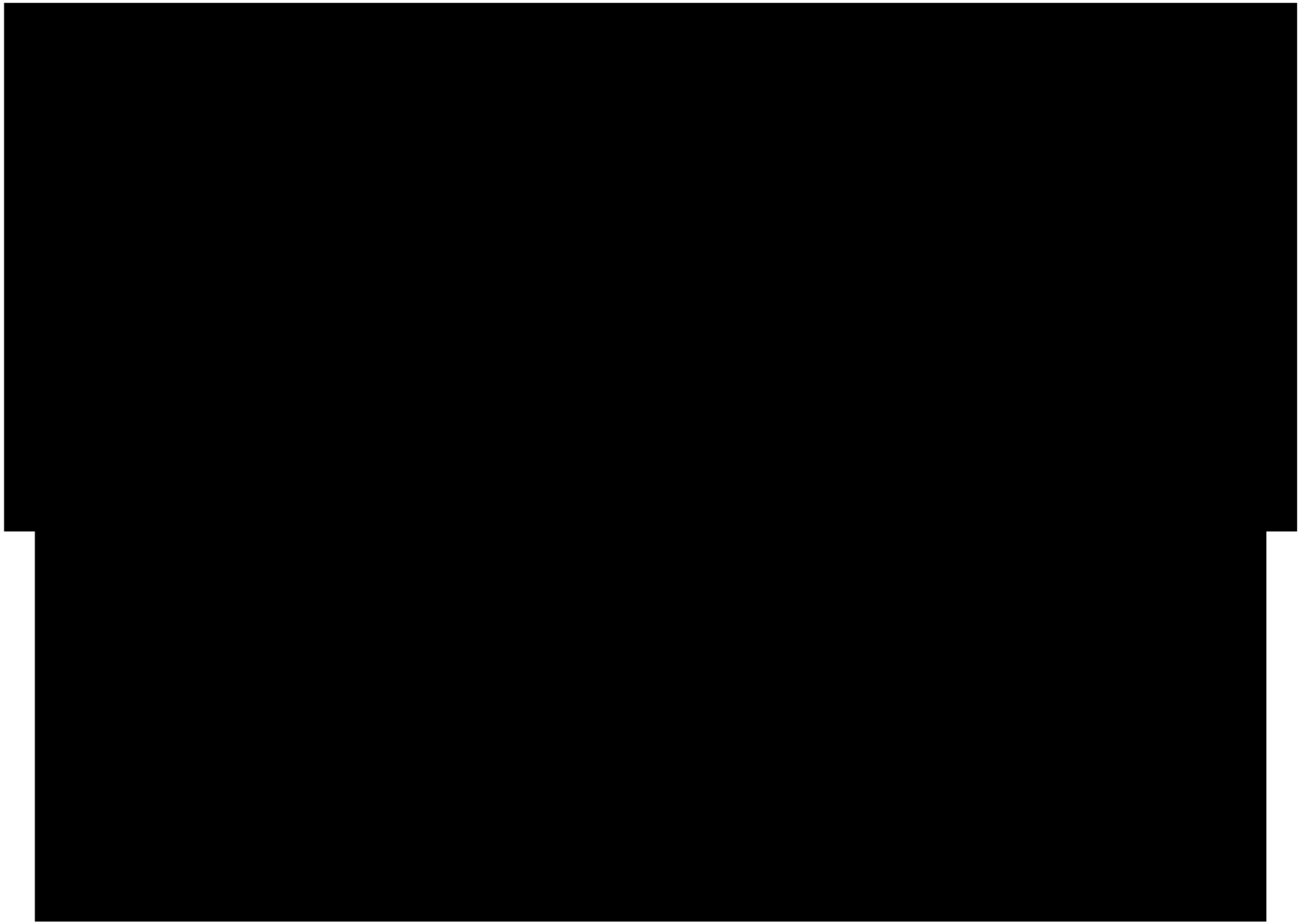

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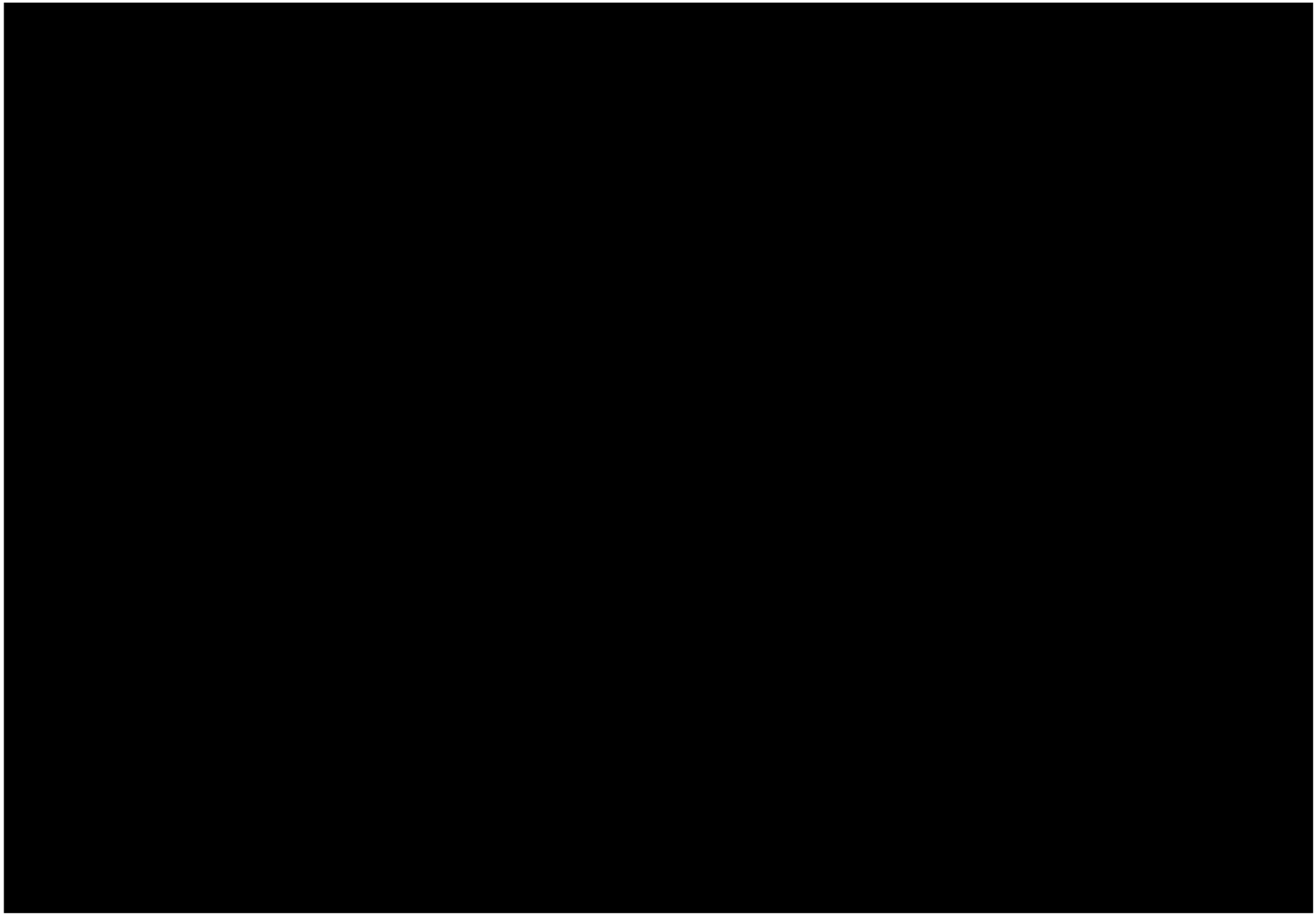

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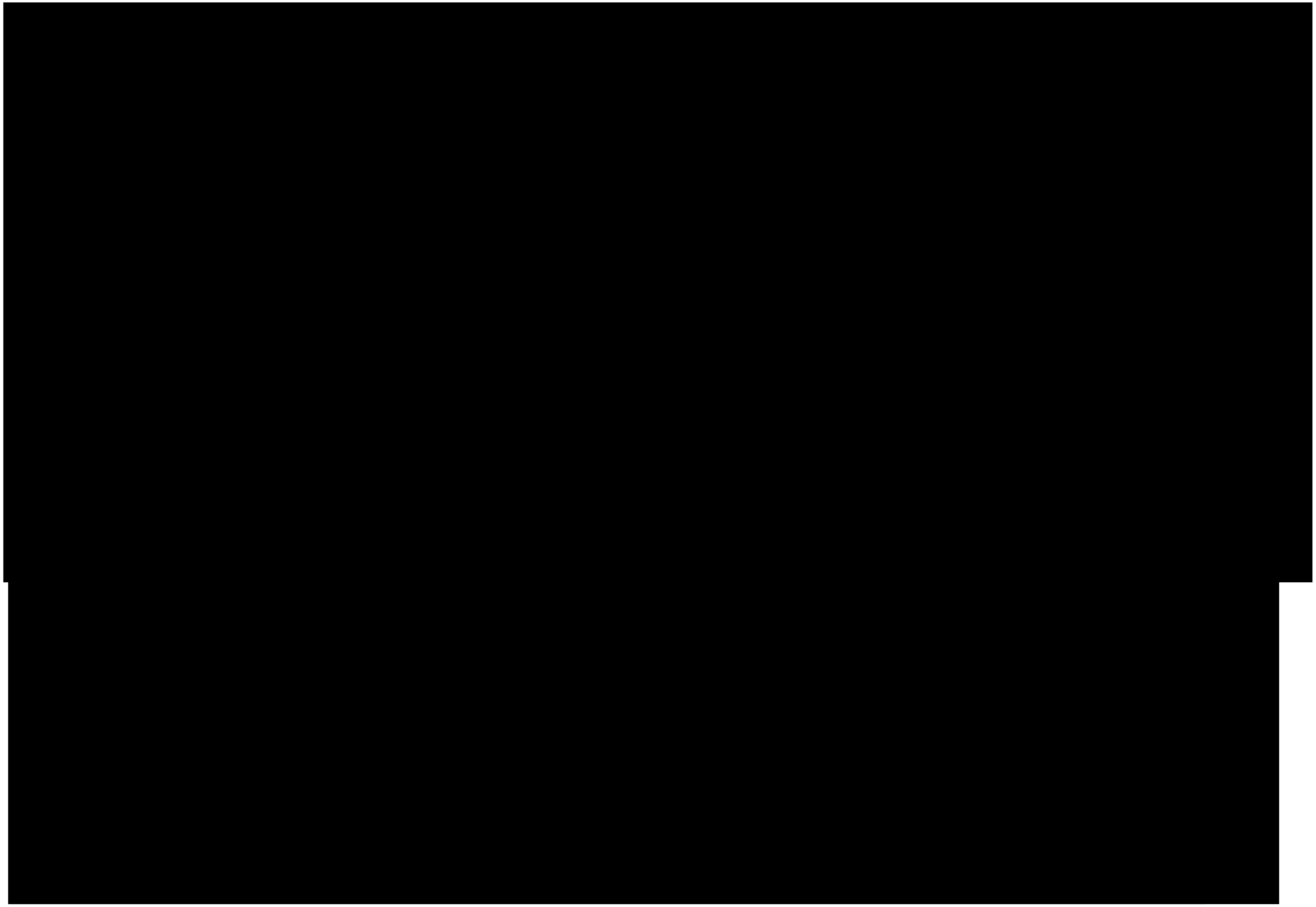

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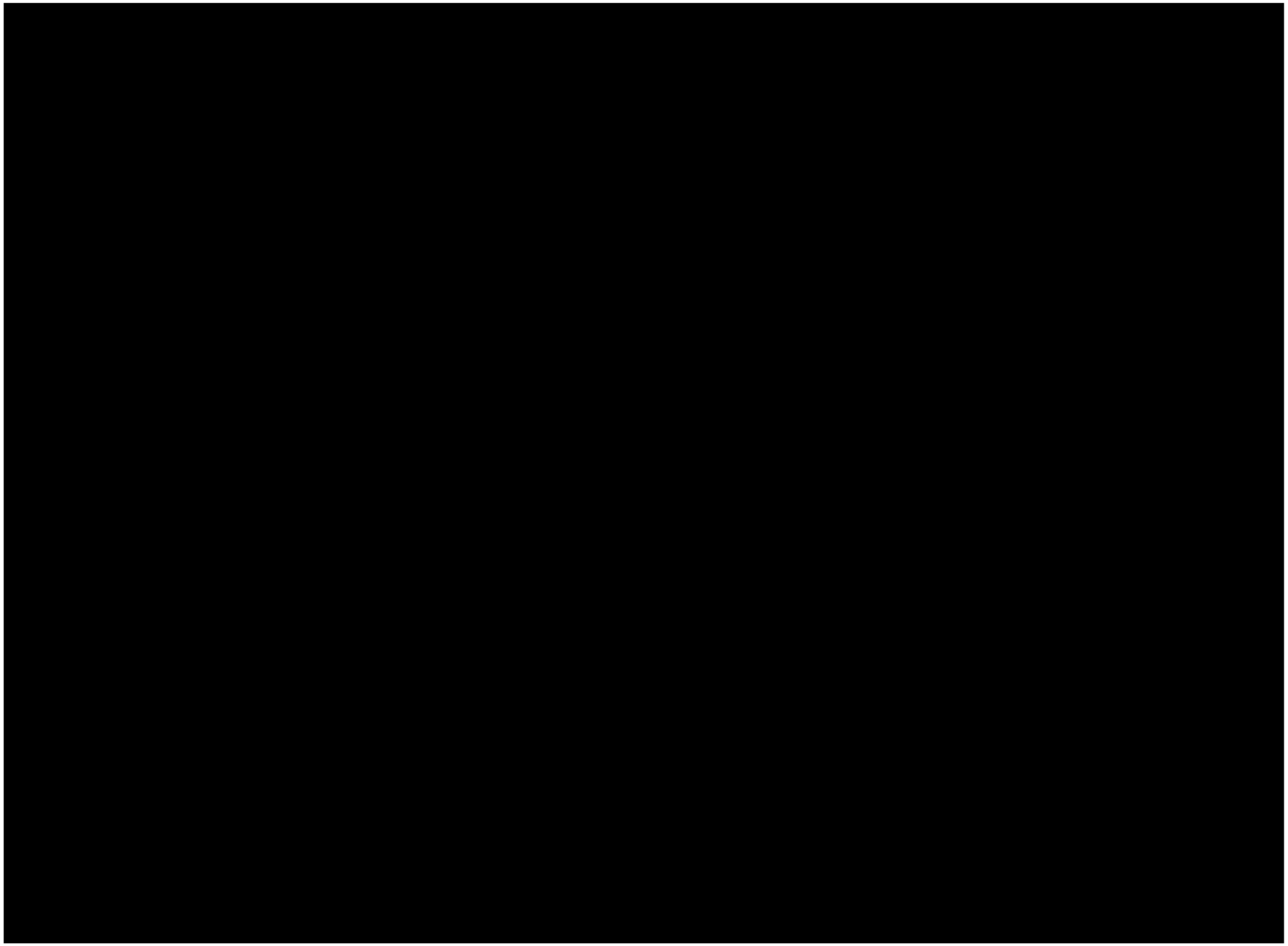

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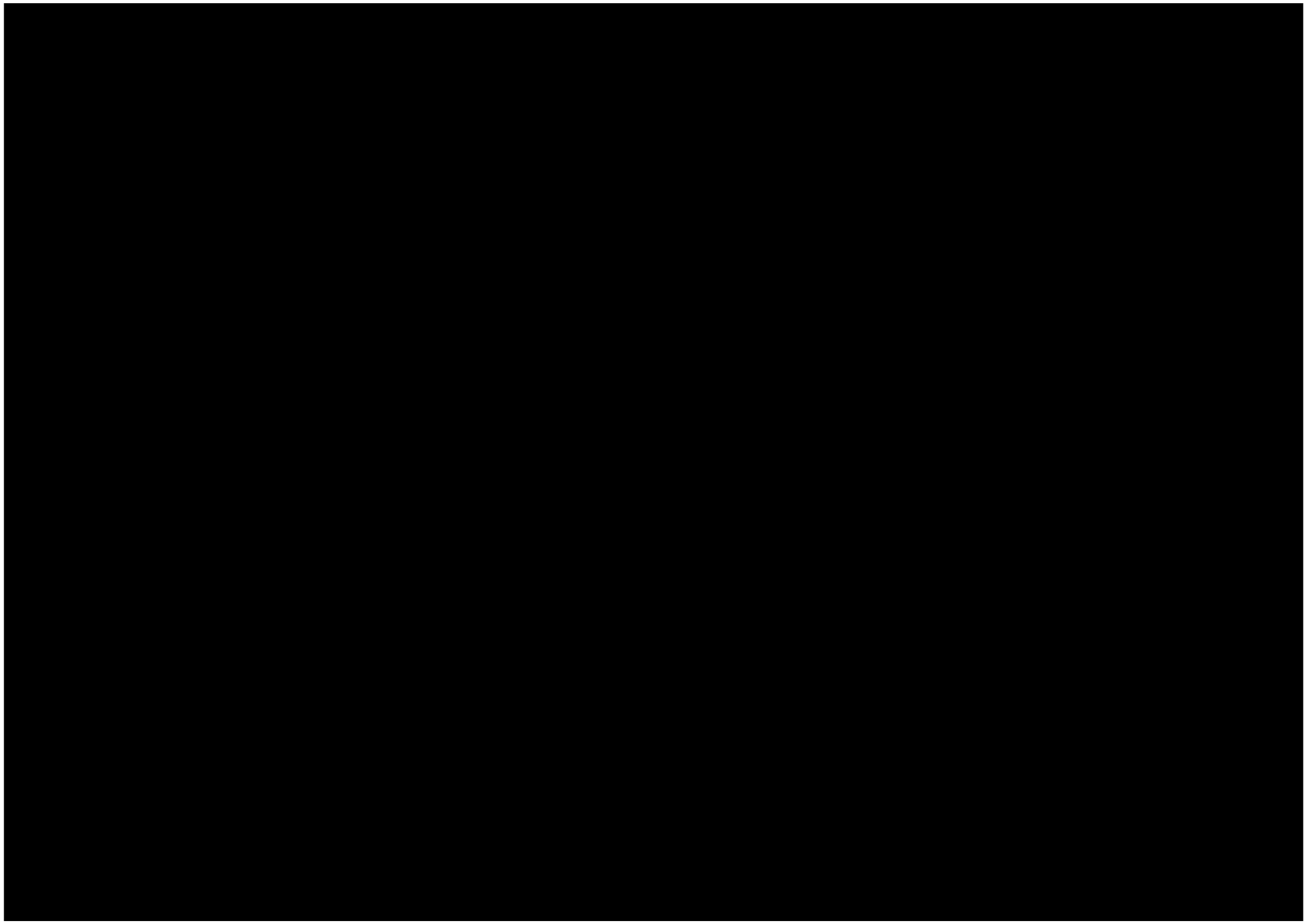

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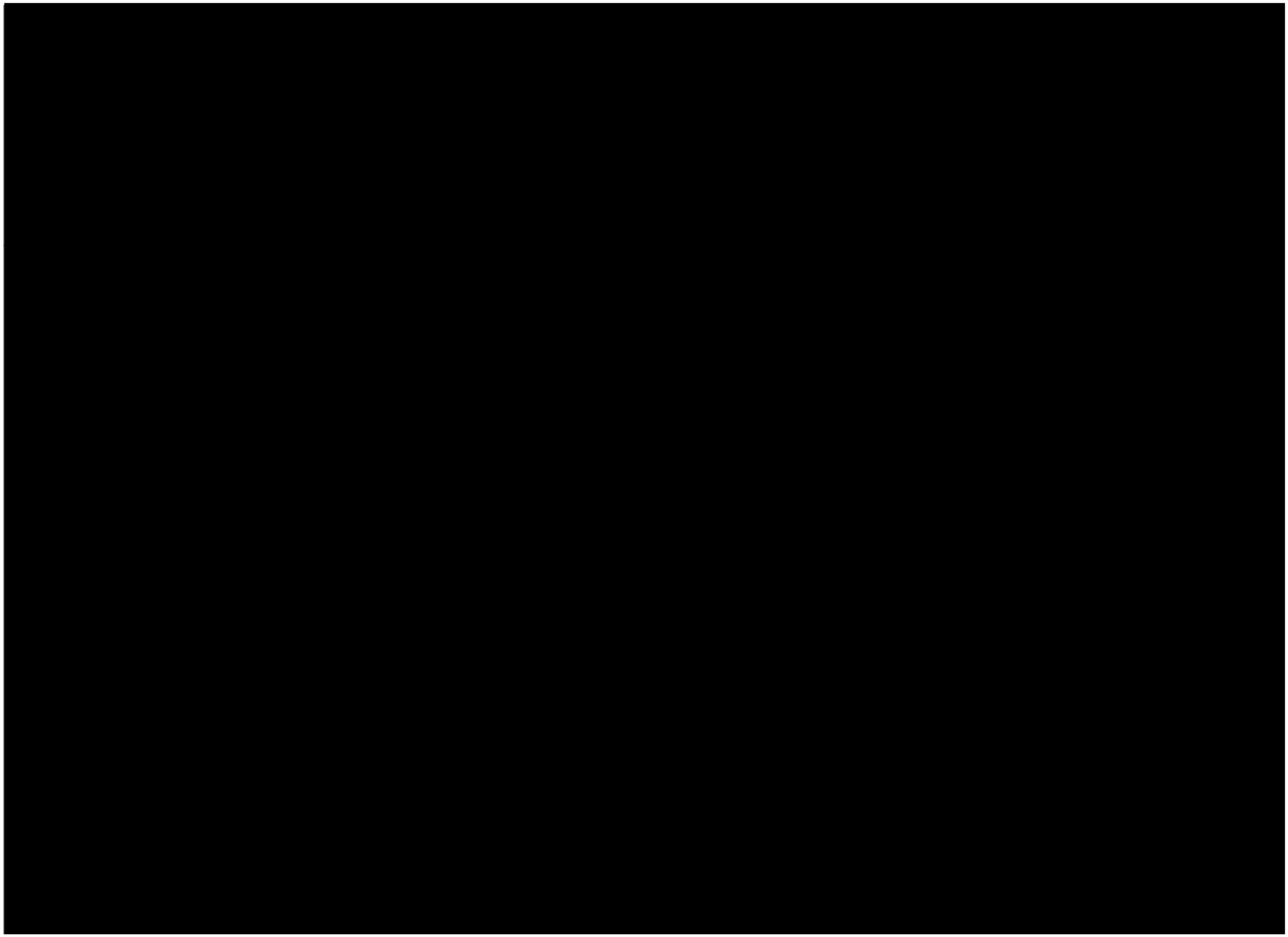

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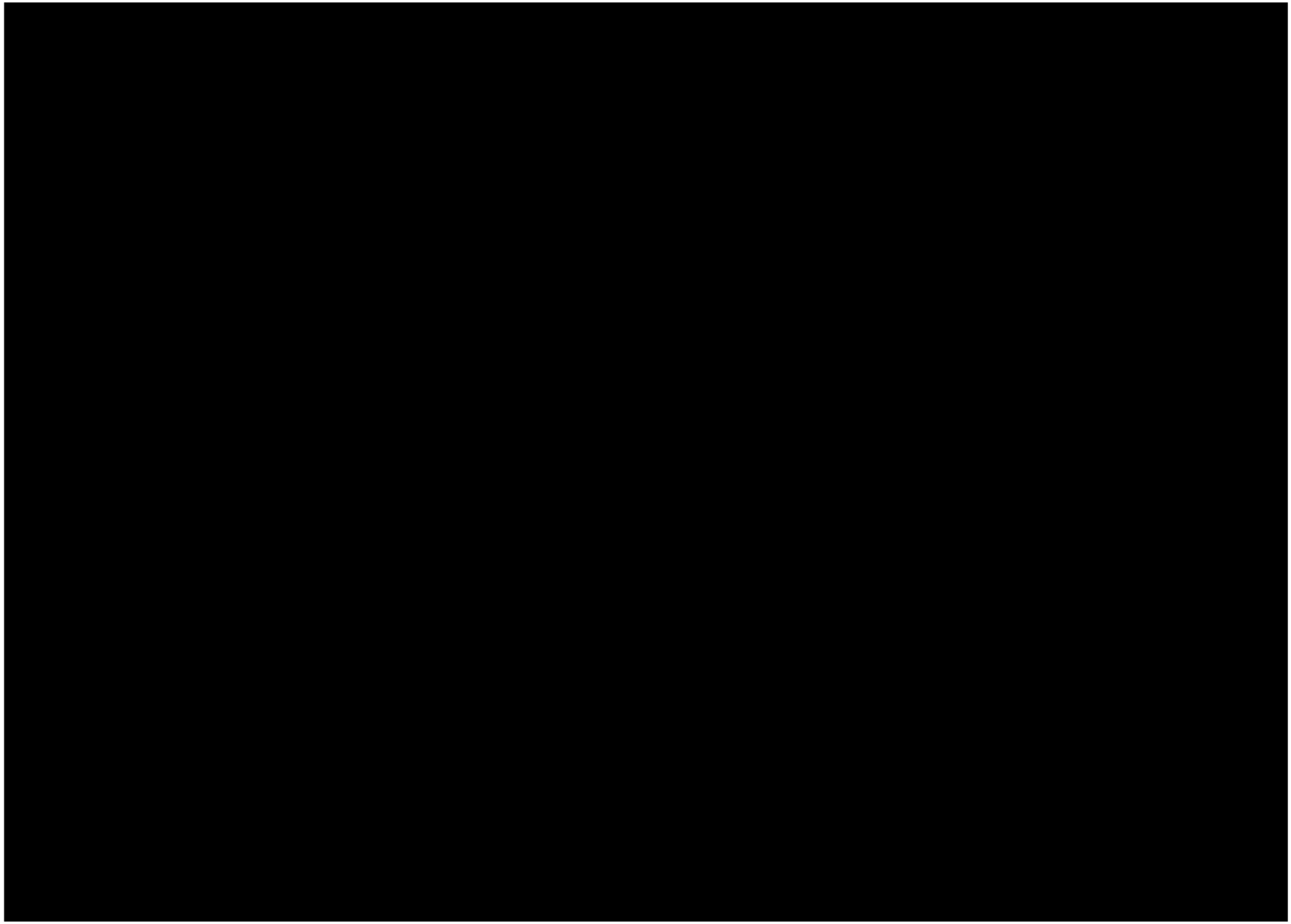

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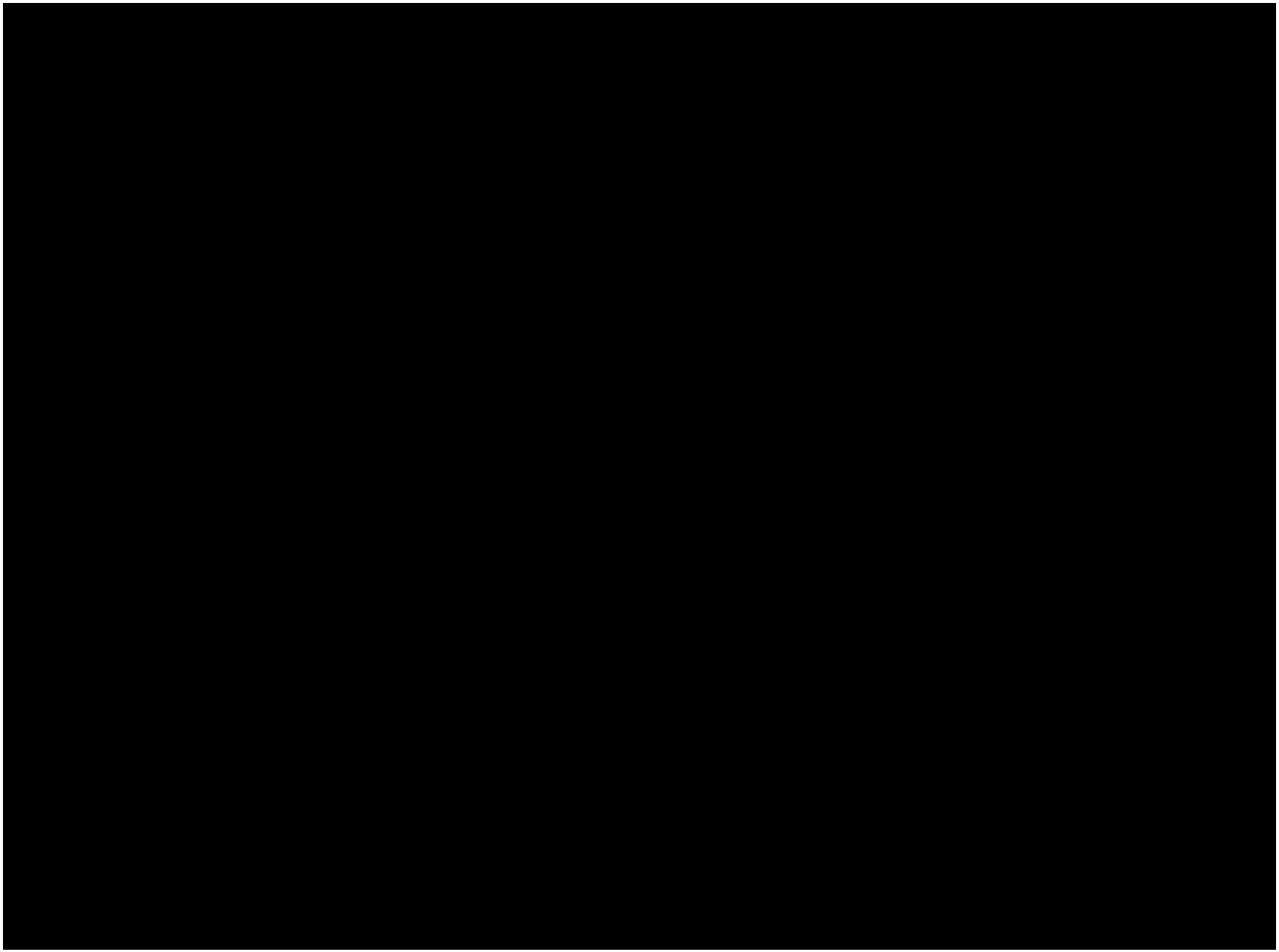

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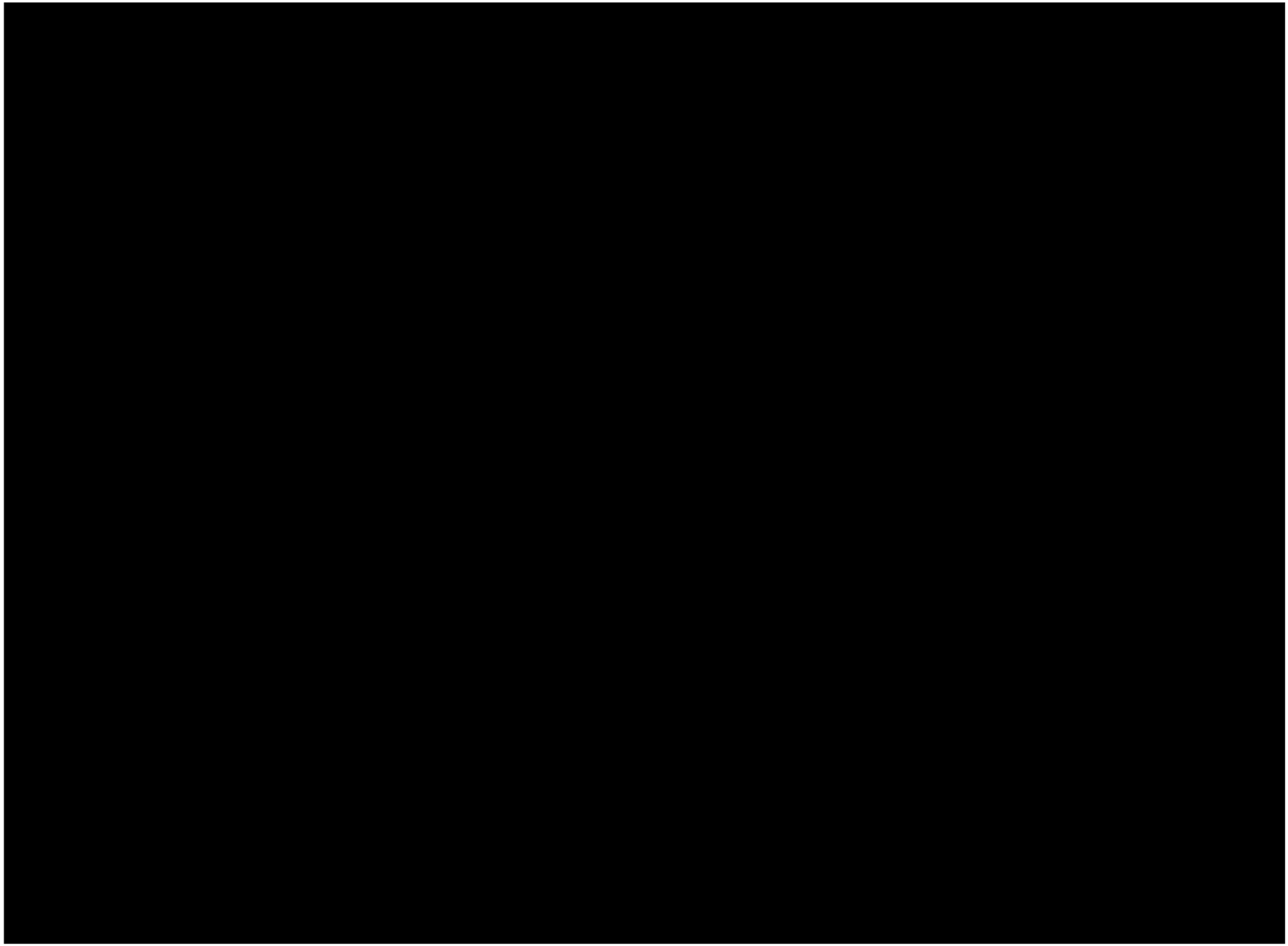

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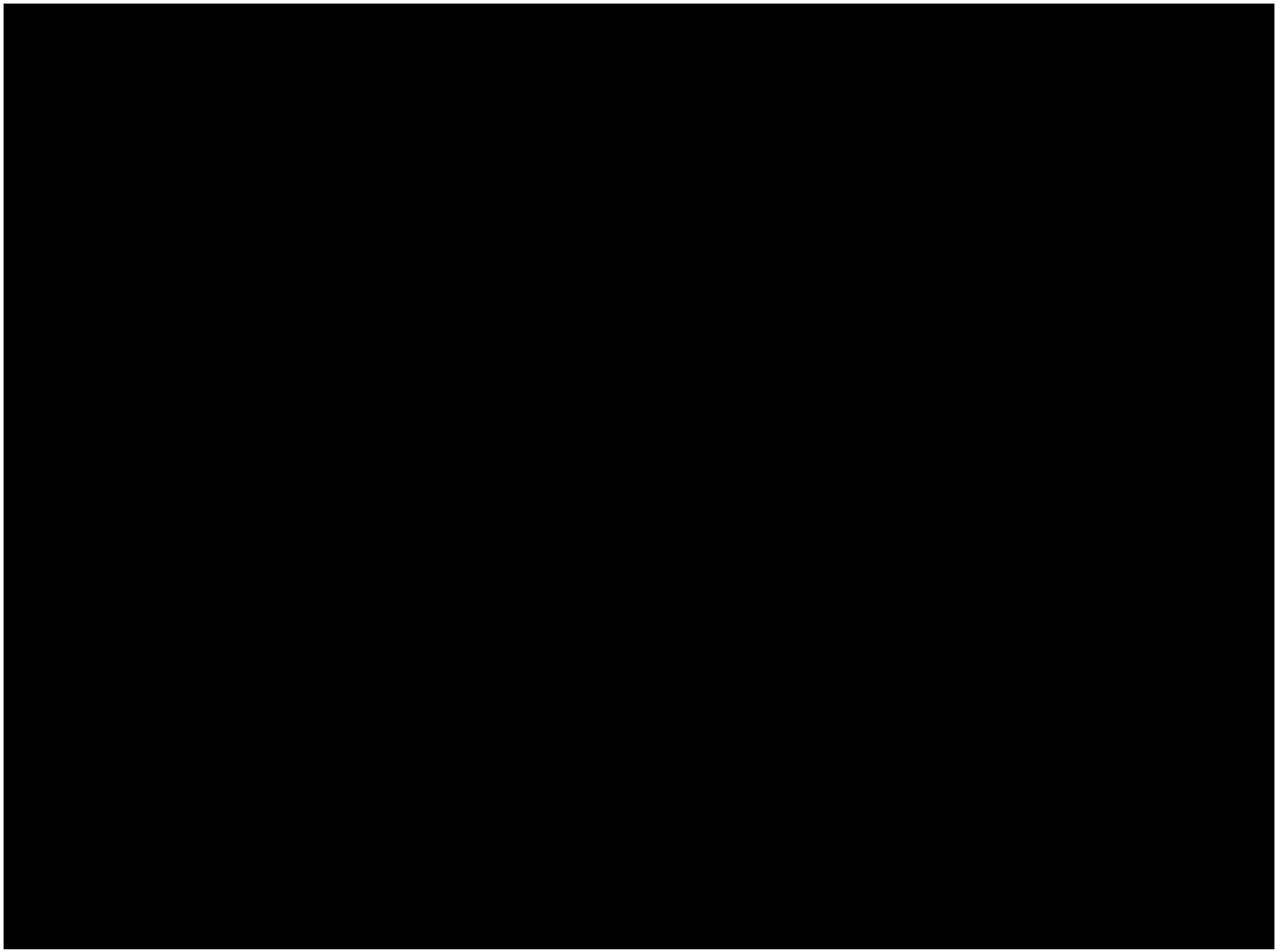

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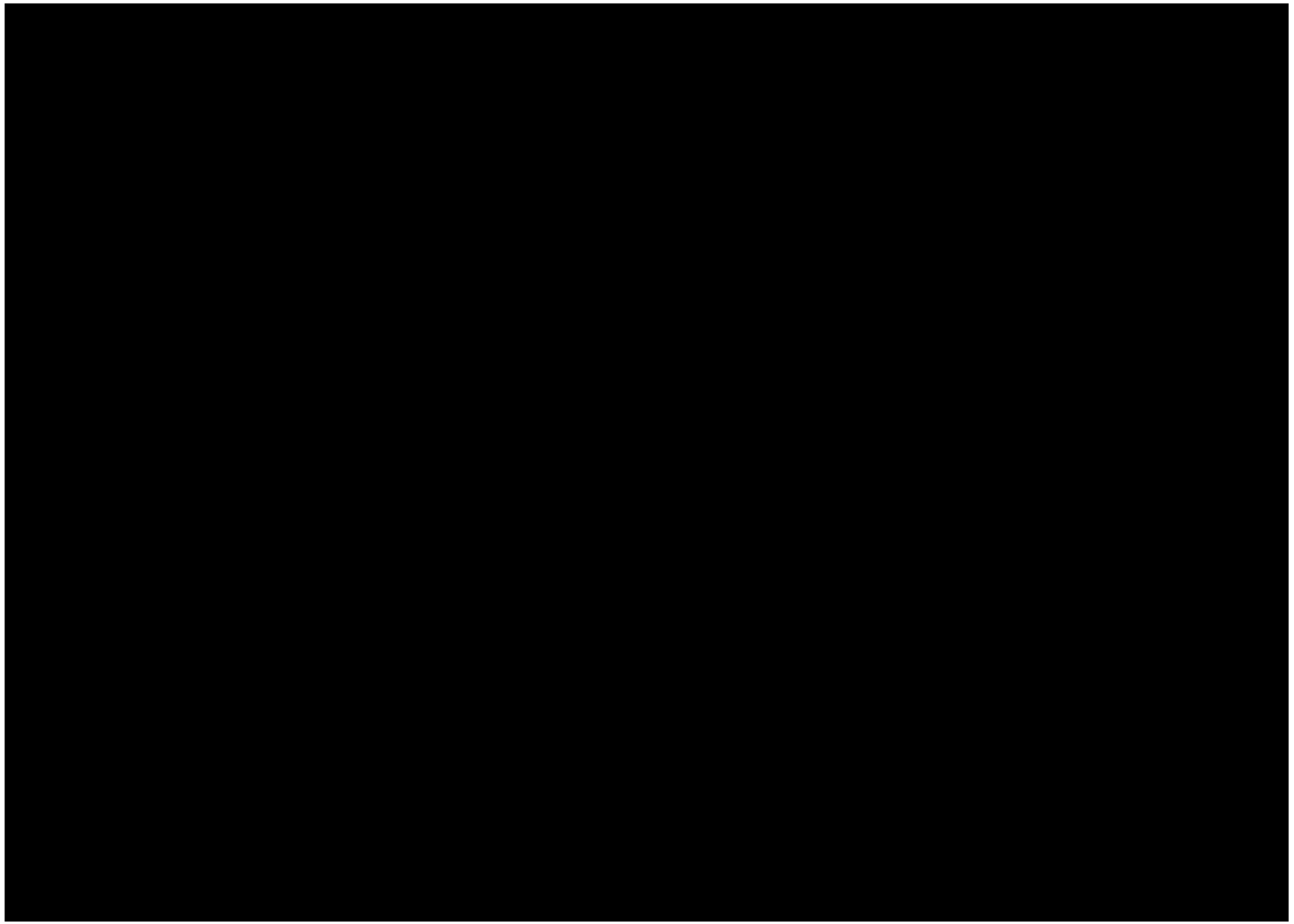

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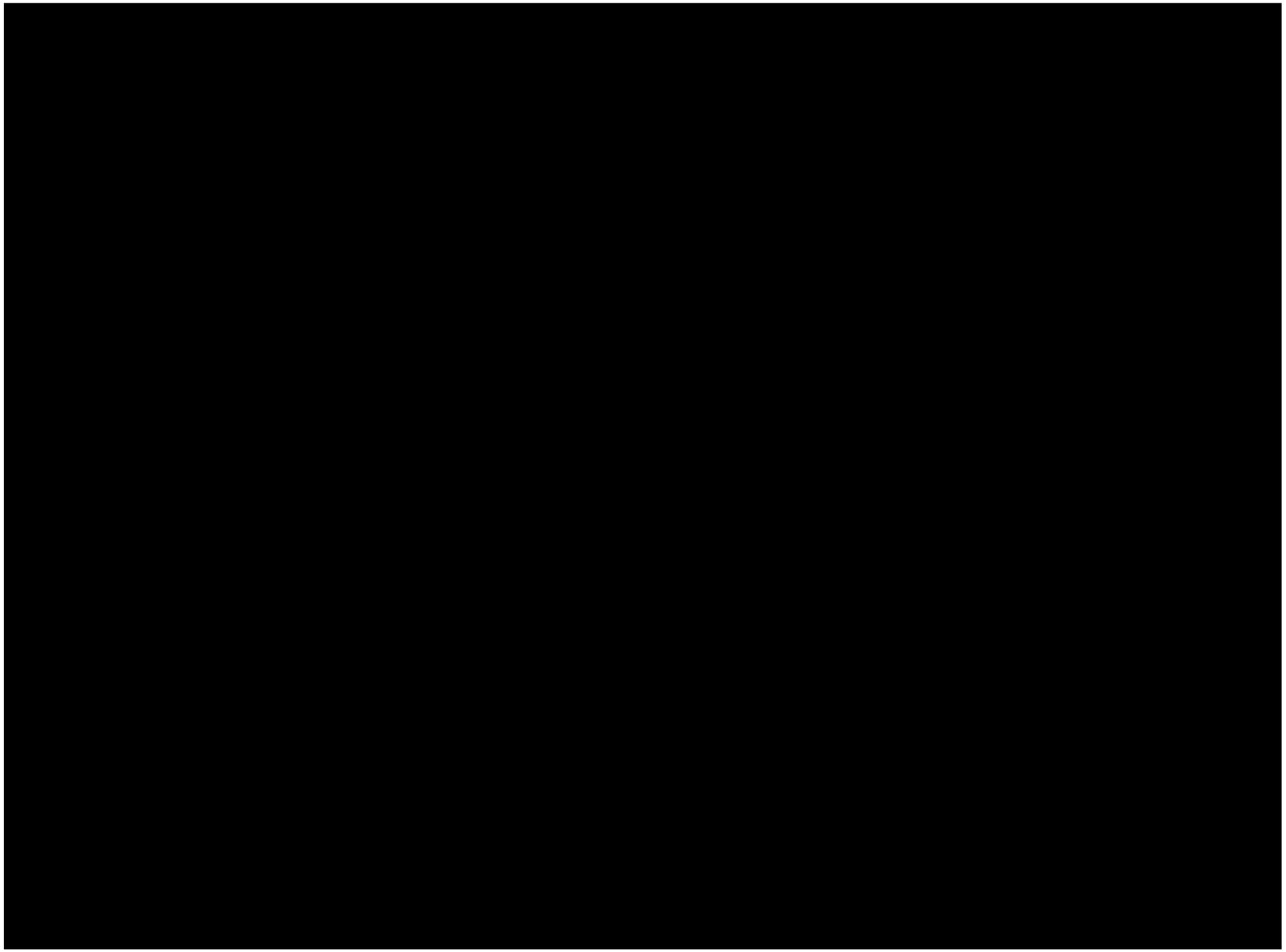

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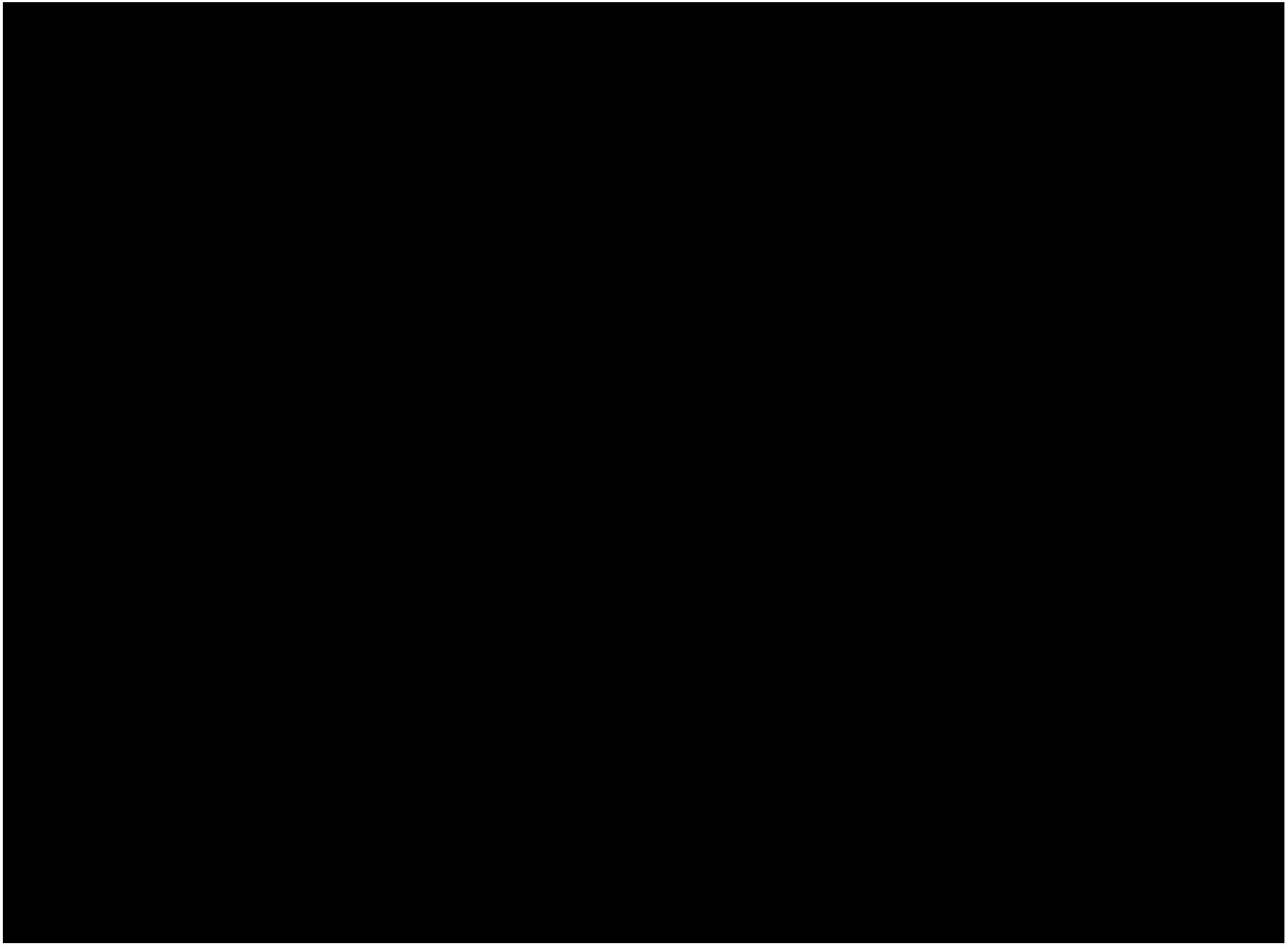

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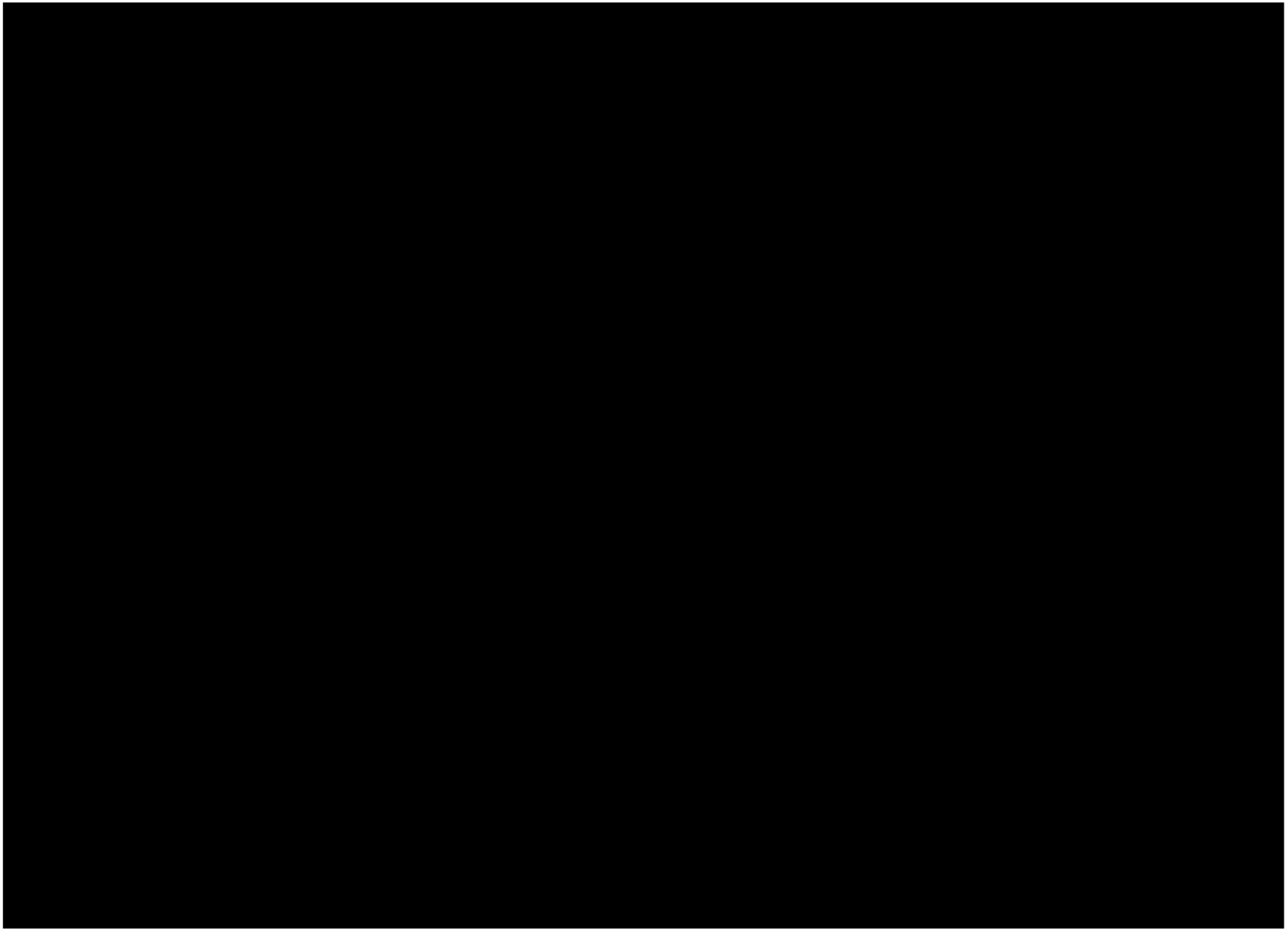

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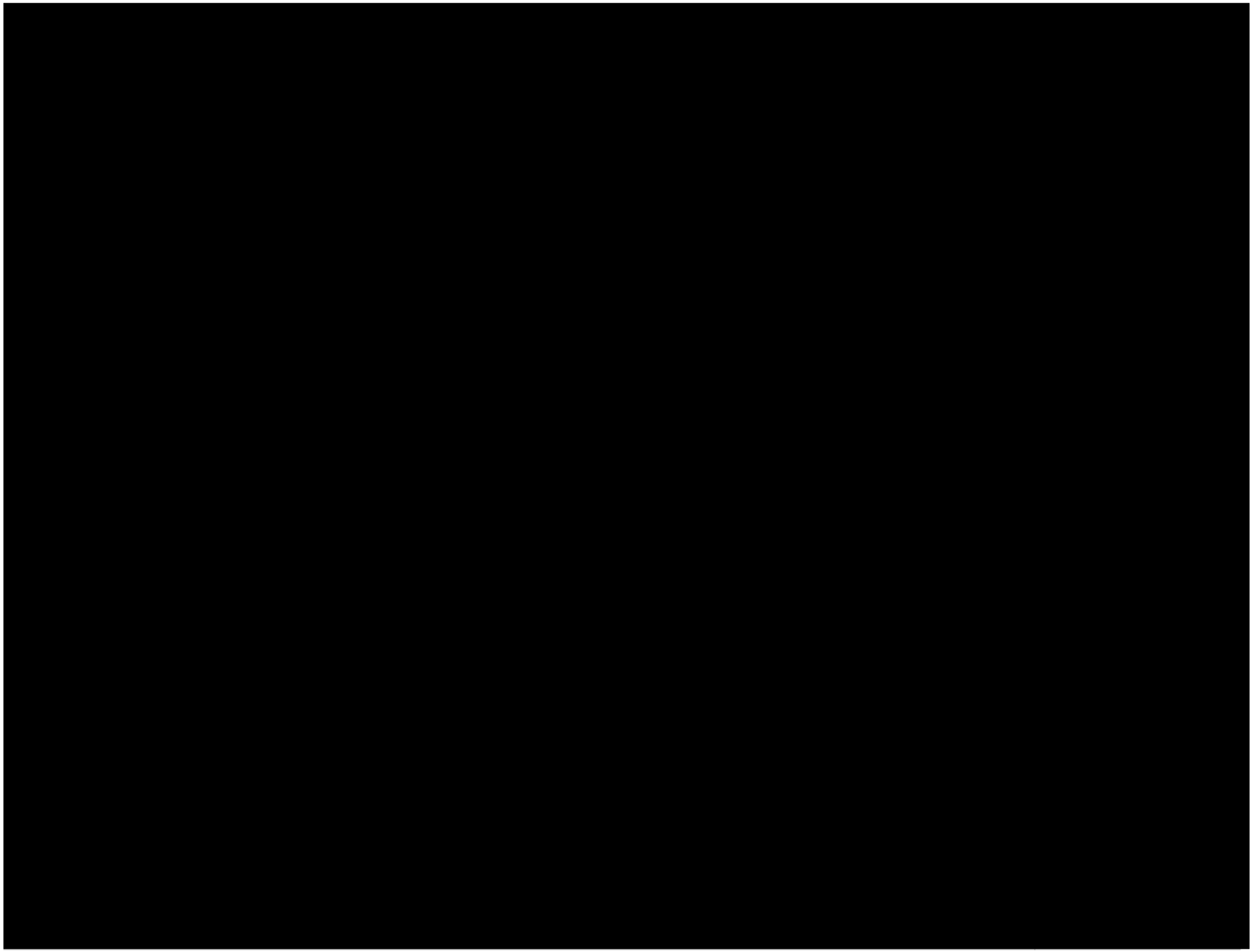

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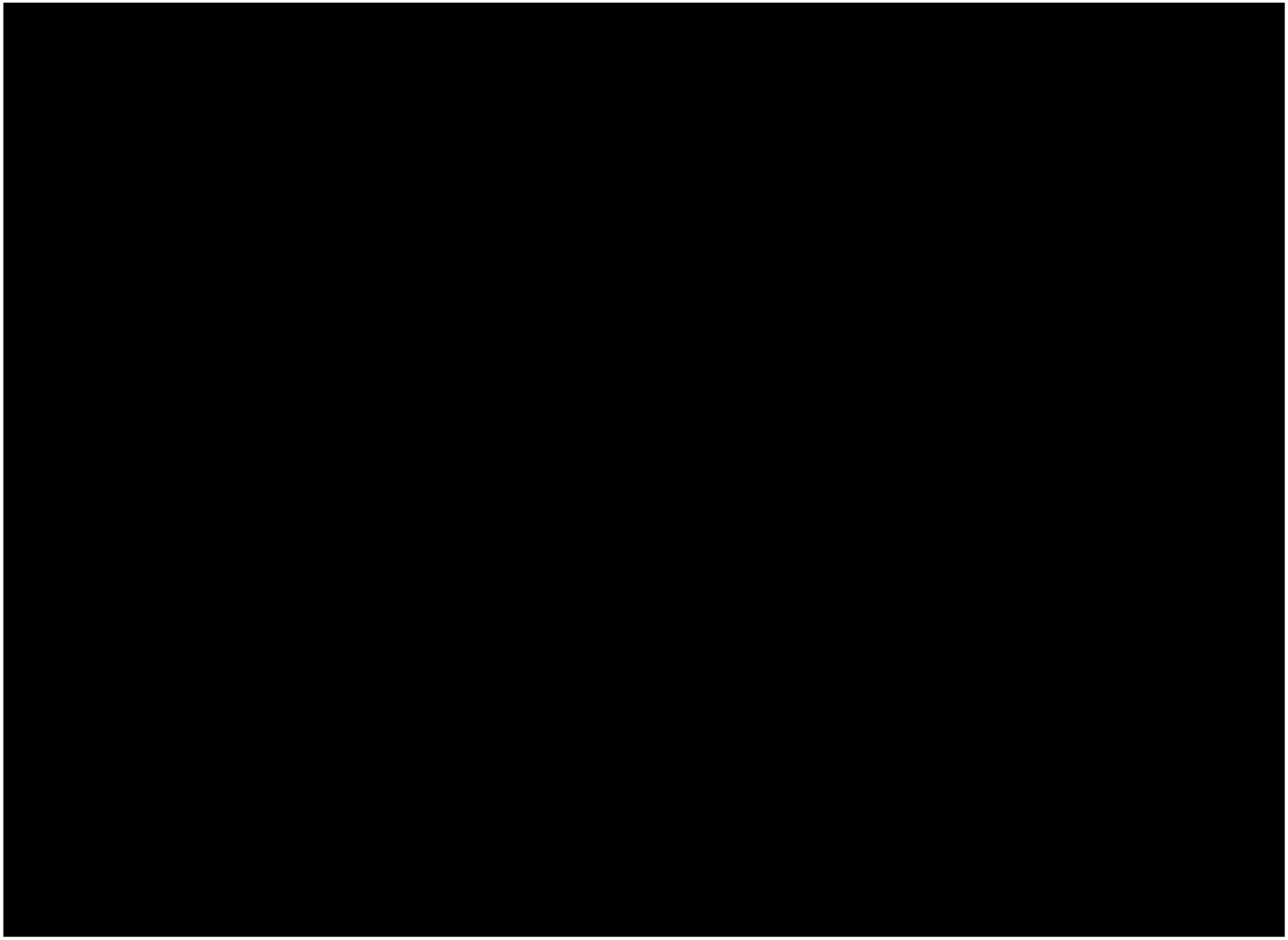

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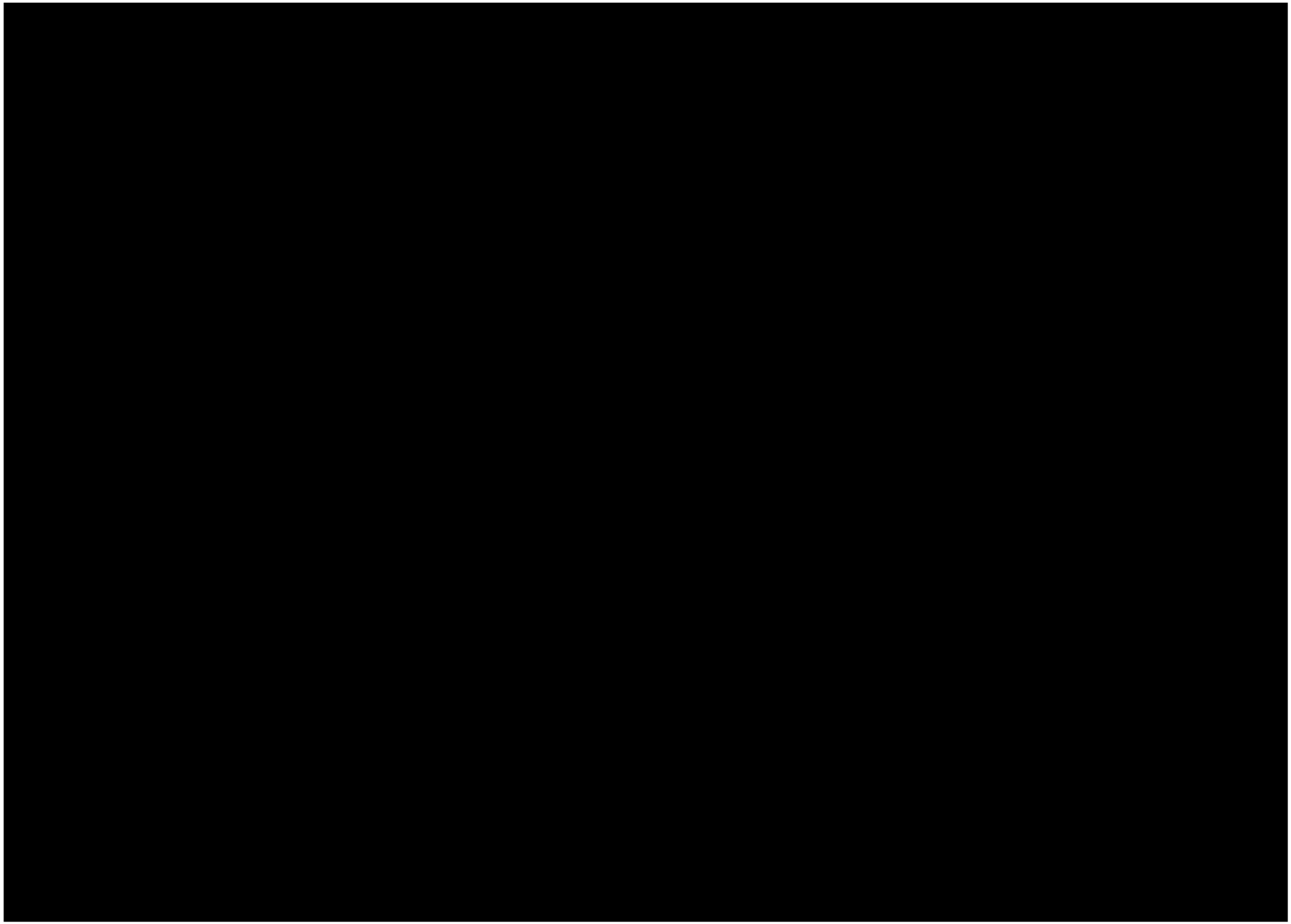

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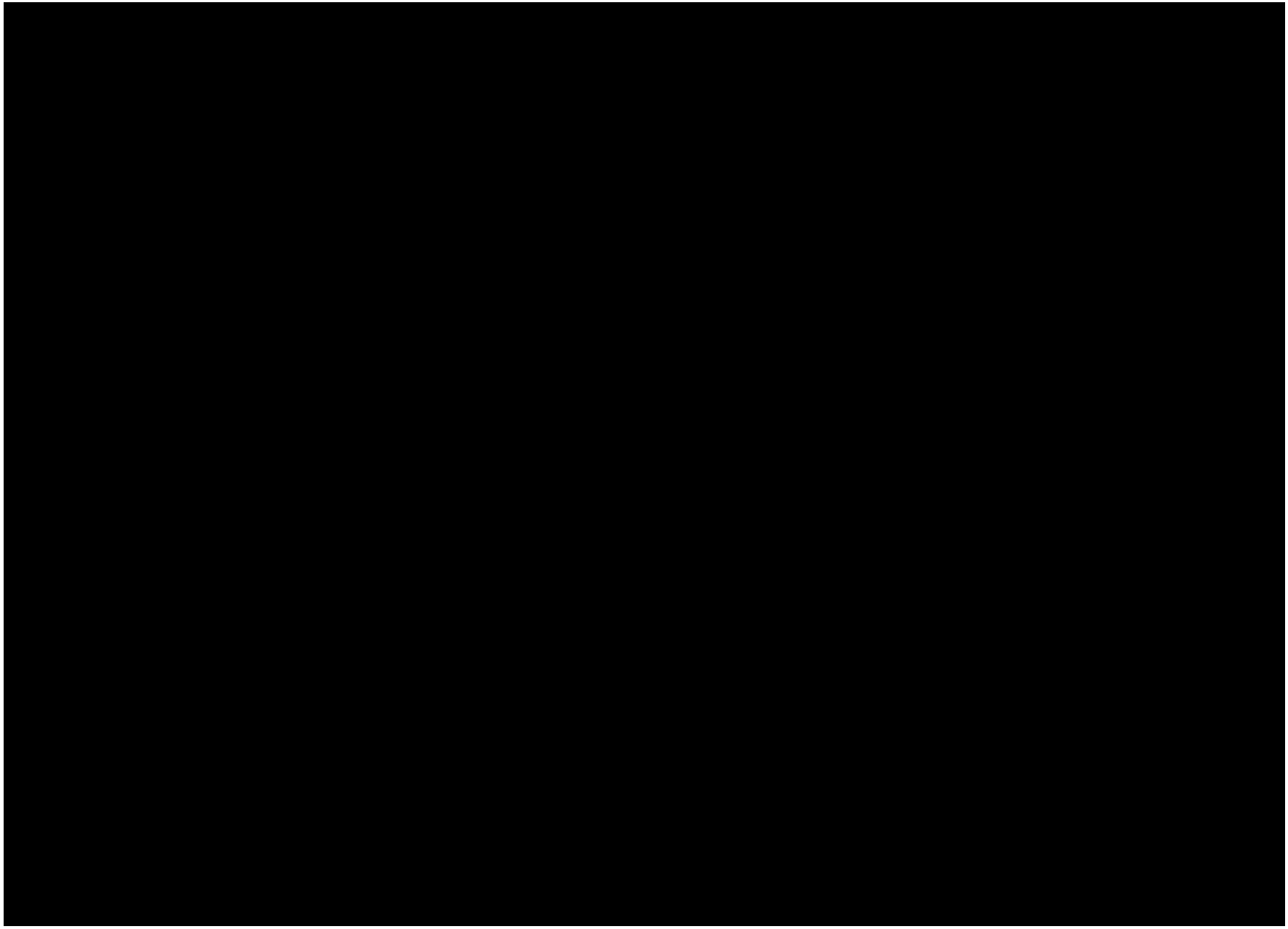

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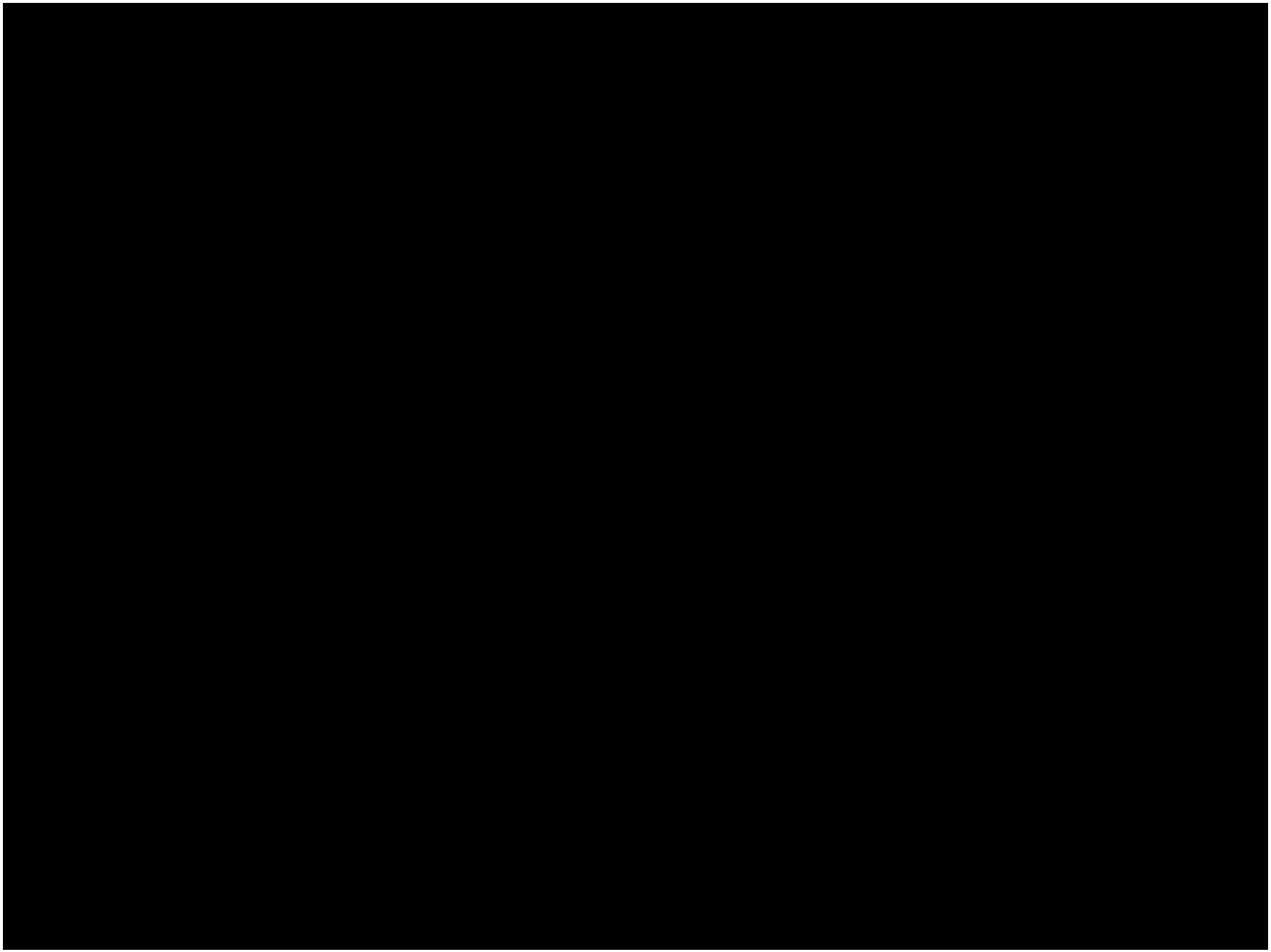
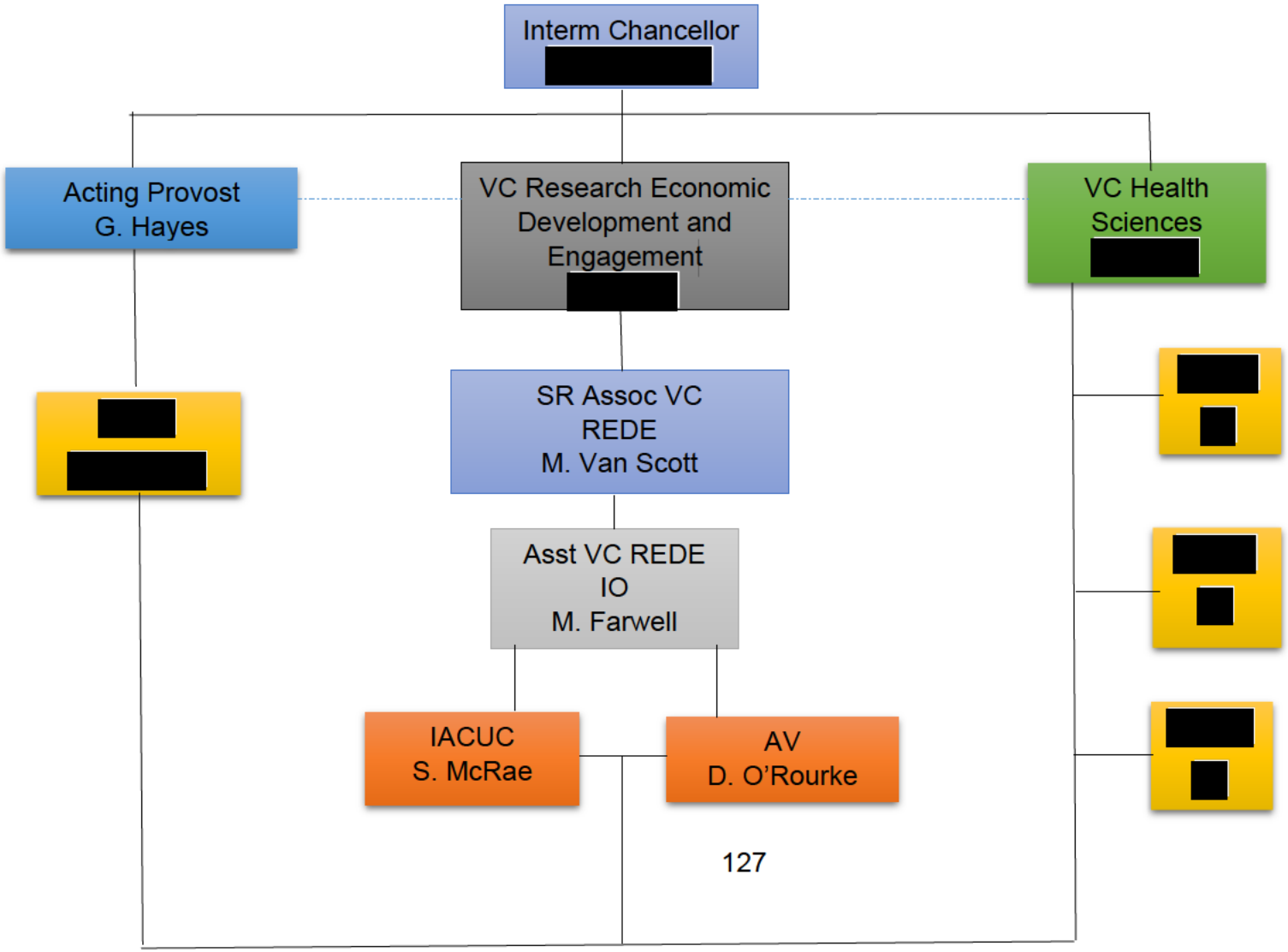


Appendix 4: Organizational Chart(s)

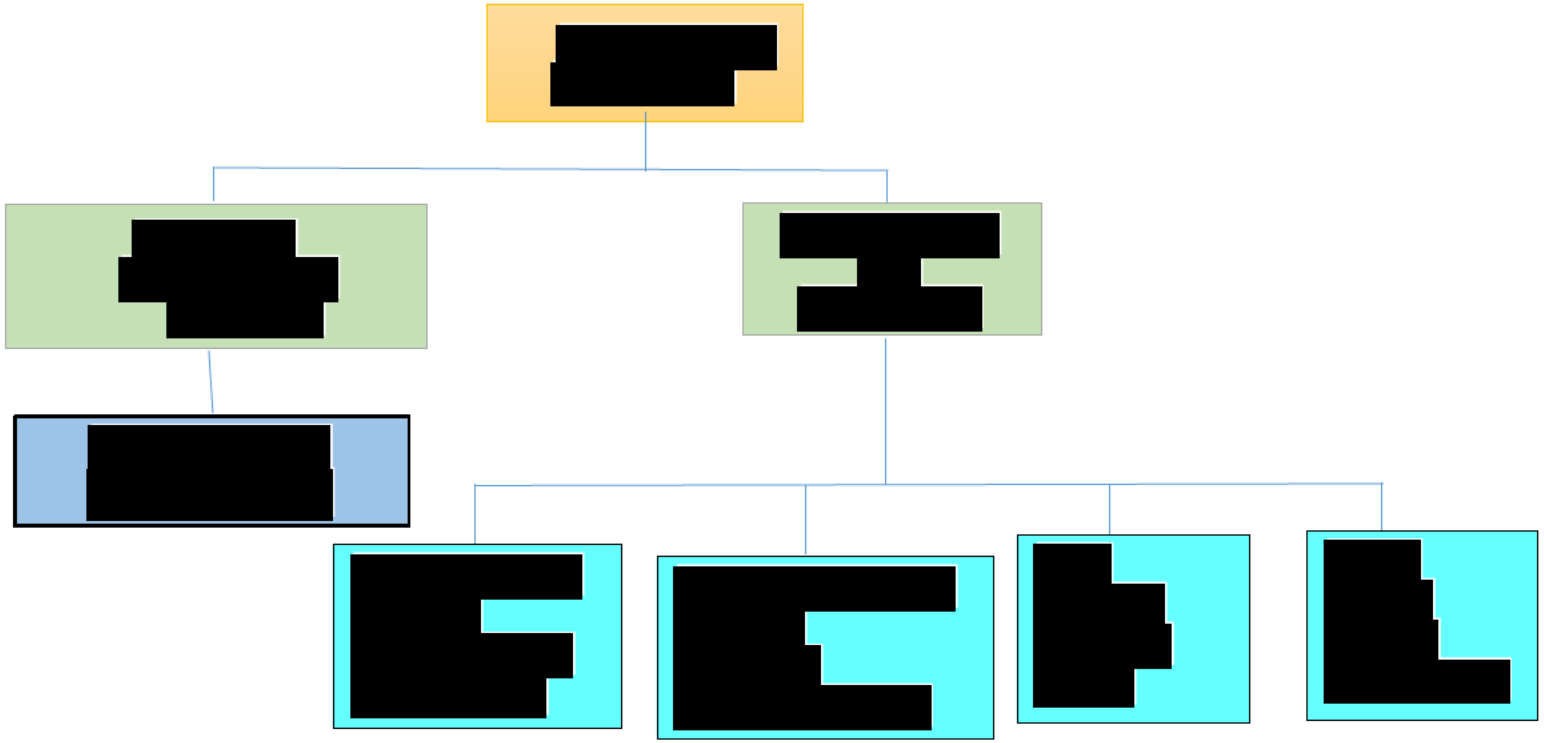
Provide an accurate, current, and detailed organization chart or charts that detail the lines of authority from the Institutional Official to the Attending Veterinarian, the IACUC/OB, and personnel providing animal care. If applicable, include personnel responsible for managing satellite housing areas/locations and depict the reporting relationship between the Attending Veterinarian and other(s) having a direct role in providing veterinary care.

ORGANIZATIONAL CHART COMPLIANCE OVERSIGHT



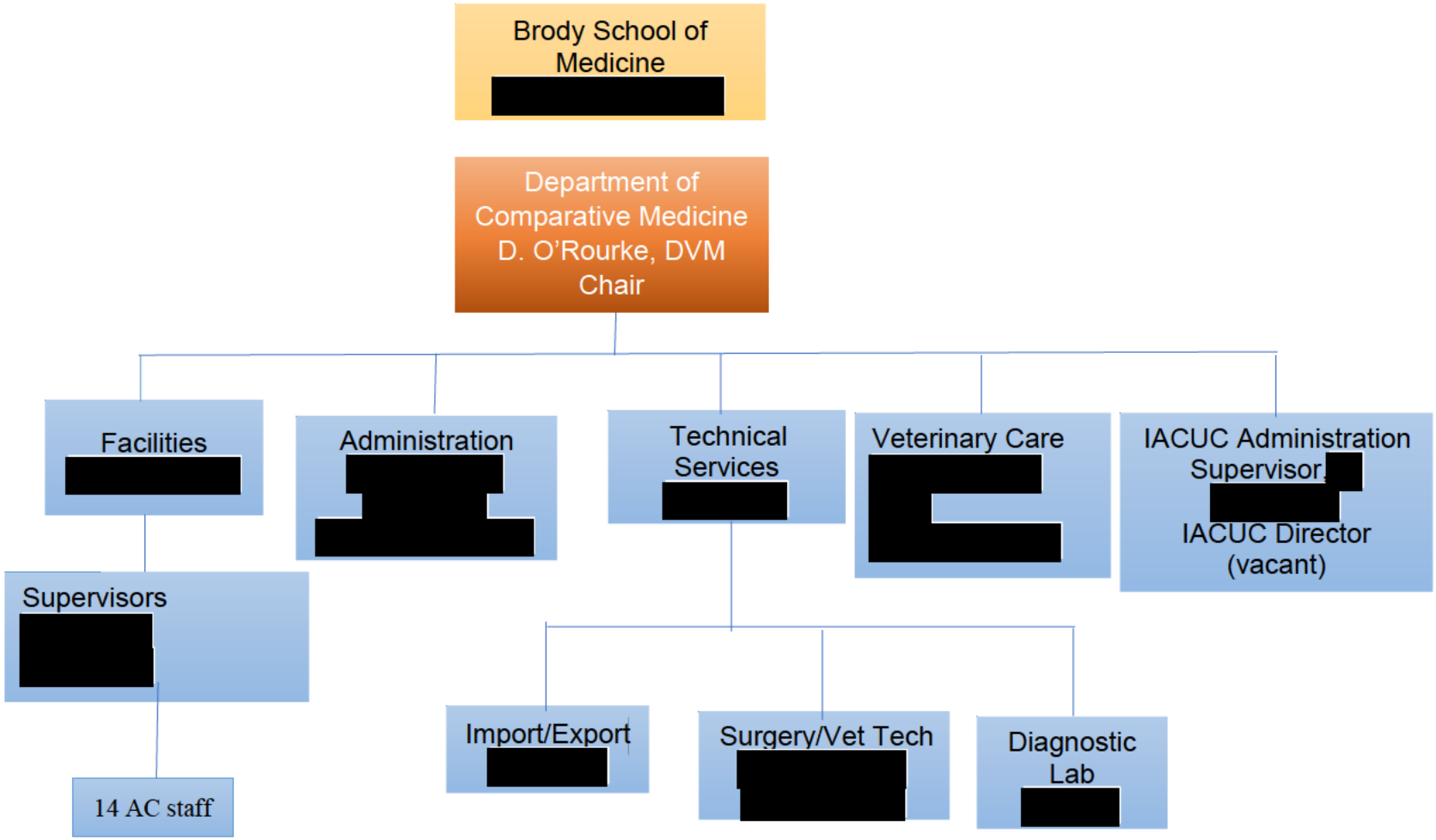
Appendix 4: Organizational Chart(s)

THOMAS HARRIOT COLLEGE OF ARTS AND SCIENCES



Appendix 4: Organizational Chart(s)

BRODY SCHOOL OF MEDICINE



Appendix 5: Animal Usage

In order to assist the site visitors in their evaluation of the animal care and use program, please provide the information requested below. Information should be provided for all animals approved for use in research, teaching or testing, including those which may be used or housed in laboratories outside the animal care facility. Of particular interest is information on those animals which are used in research projects involving recovery surgical procedures, behavioral or other testing requiring chairing or other forms of restraint, or exposure to potentially hazardous materials. An alternate format is acceptable as long as the information requested is provided.

Project/Protocol Title	IACUC/OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
[redacted]											

Appendix 5: Animal Usage

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[redacted]											

Appendix 5: Animal Usage

(1) If applicable, please provide a description / definition of any pain/distress classification used within this Appendix in the space below. If pain/distress categories are not used, leave blank.
(2) Survival Surgery (SS)
(3) Multiple Survival Surgery (MSS)
(4) Food or Fluid Regulation (FFR)
(5) Prolonged Restraint (PR)
(6) Hazardous Agent Use (HAU)
(7) Non-Centralized Housing and/or Procedural Areas (NCA), i.e., use of live animals in any facility, room, or area that is not directly maintained or managed by the animal resources program, such as investigator laboratories, department-managed areas, teaching laboratories, etc.

Pain/Distress Classification Description/Definition, if applicable:

ECU uses pain categories based on USDA columns B-E.

In the Table below, provide an approximate annual usage for all species:

Animal Type or Species	Approximate Annual Use
Mouse	20276
Rat	501
NHP	20
Pig	9
Finch	726
Zebra Fish	8,162

Animal Type or Species	Approximate Annual Use
Stickleback	85
Wild native fish	10,426
Poison Dart Frog	193
Wild Birds	215

Appendix 6: Personnel Medical Evaluation Form

Provide a ***blank*** copy of form(s) used by medically-trained personnel to review individual health assessment, individual risk assessment, health history evaluation, health questionnaire, periodic medical evaluation, etc. If form(s) are not used, include a description of how such evaluations are performed in the Program Description (Section 2.I.A.2.b.ii.1).d), Section 2 (Description). I (Animal Care and Use Program). A (Program Management). 2 (Personnel Management). b (Occupational Health and Safety or Personnel). ii (Standard Working Conditions and Baseline Precautions). 1) (Medical Evaluation and Preventive Medicine for Personnel). d).

OFFICE OF PROSPECTIVE HEALTH

EAST CAROLINA UNIVERSITY BRODY SCHOOL OF MEDICINE

BASIC HEALTH HISTORY FORM – ANIMAL USERS

PERSONAL

Name:_____ **Date of Birth:** _____

Home Address:_____**City:**_____**Zip:** _____

Home Phone:_____ **Work Phone:** _____**Sex: M F**

Previous *ECU* hire? ___yes ___no Have you had a name change? _____yes _____no___

*********<u>***IN ORDER TO RECEIVE MEDICAL CLEARANCE ALL QUESTIONS NEED TO BE ANSWERED***</u>********

STATUS

☐ **ECU Employee** ☐ **Self Help Student Worker** ☐ **ECU Student**

☐ **Member of ECU Animal Care and Use Committee** ☐ **Other (specify)** _____

Date hired:_____**Job title:**_____**Dept:** _____**Bldg./Room:** _____

Appendix 6: Personnel Medical Evaluation Form

Supervisor: _____

Do you work directly with laboratory animals?_____yes_____no

Do you work around animals or their tissues?_____ yes _____ no)

Do you enter a laboratory where animals are used or housed?_____ yes _____ no)

(If no, will you in the future?_____ yes _____ no)

Do you work with or have contact with animals in the field?_____ yes _____ no)

What type/species of animals are/will you be using? _____ rodents _____ dogs _____ pigs _____ cattle

_____ birds _____ fish _____ rabbits _____ wildlife _____ sheep/goats _____ primates _____ reptiles

_____ amphibians _____ other _____

Do you work with any tissues obtained from an abattoir/slaughterhouse? __*yes* __no If yes, what species?_____

_____

HEALTH HISTORY

Do you have any current or chronic health problems? _____yes_____no (specify) _____

_____

Do you take any medications? Please list _____

_____

Have you missed work due to being in the hospital in the past 2 years? _____yes_____no

Do you have any limitations or disabilities related to your current health problems that would affect your job? _____yes_____no (specify)

_____

Do you require any particular accommodations or restrictions for any current health problem?

Appendix 6: Personnel Medical Evaluation Form

_____yes_____no(specify) _____

Do you have a history of asthma or wheezing?_____yes_____no

Do you have any problems breathing or shortness of breath?_____yes_____no

Are there any activities which cause you problems? _____yes_____no _____

Do you have a history of color blindness or problems distinguishing colors?_____yes_____no

ALLERGIES (list cause and type of reaction)

Environmental (dust, pollen, mold, etc.)_____ Animals _____

Latex/rubber_____ Medications _____

Have you ever experienced: wheezing, difficulty breathing, coughing, skin rashes, swelling, hives, itching, watery eyes or runny nose or sneezing when in contact with such items as balloons, rubber balls or toys, gloves, condoms, dental dams, or other rubber products? yes _____ no

Have you ever experienced any reactions when exposed to latex gloves, directly or indirectly, or any other natural rubber latex products or the powder from these natural rubber latex products?

_____ yes _____ no

Nature of reaction? _____

Have you ever experienced: wheezing, difficulty breathing, coughing, skin rashes, swelling, hives, itching, watery eyes or runny nose or sneezing when in contact with animals? _____ yes _____ no

What animals? _____

Appendix 6: Personnel Medical Evaluation Form

PAST IMMUNIZATIONS

Have you had the disease: **Yes/No** **Date**

Measles _____ _____

Chicken Pox _____ _____

Have you been immunized for:

	Yes/No	Date:	Date:	
Measles		_____	_____	_____
Chicken Pox	_____		_____	_____

When was your last tuberculosis (TB) skin test? Date _____

Have you received BCG immunization for tuberculosis?_____yes_____no

Have you ever had a <u>positive</u> TB skin test in the past?_____yes_____no

If so, did you have a chest x-ray?_____yes_____no

If positive, did you receive treatment for 6 or 9 months?_____yes_____no

Appendix 6: Personnel Medical Evaluation Form

Are you potentially exposed to *human* blood/or other body fluids or *human* tissue or cell culture in the course of your work? _____ yes _____ no

Have you received Hepatitis B vaccinations - 3 doses? _____ yes _____ no (year _____)

Are you immune to Hepatitis B based on prior infection or blood test? _____ yes _____ no

▶ When was your last *Tetanus Diphtheria, Td or Tdap* shot? _____

Have you been immunized for rabies?_____yes_____no When? _____

Are you on any work restrictions due to limitations under NC Administrative Code for HIV or Hepatitis B?_____yes_____no

Employee Signature_____ Date _____

Please return to: Prospective/Employee Health
744-2070/744-2417 Fax
188 Life Sciences Building

Appendix 7: IACUC/OB Membership Roster

Please provide a Committee roster, indicating names, degrees, membership role, and affiliation (e.g., Department/Division).

Names	Degree/ Credentials	Membership Role	Affiliation
Susan McRae	PhD	IACUC Chair, Scientist	Biology Department
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
Dorcas P O'Rourke	DVM, MS	Attending Veterinarian	Professor and Chair, Dept of Comparative Medicine
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

Appendix 8: IACUC/OB Minutes

Please provide the latest two Minutes of the IACUC/OB meetings.

ANIMAL CARE AND USE COMMITTEE MEETING MINUTES

September 16, 2019 **Page 159**

I. OPENING:

The Animal Care and Use Committee met at 1:00pm on Monday, September 16, 2019, in [redacted]. Dr. Susan McRae presided with the following members in attendance: [redacted] The Animal Care and Use Committee minutes from the August 12, 2019 meeting were read and unanimously approved. The next meeting is scheduled for October 21, 2019 at 1:00.

II. REPORTS FROM CHAIR AND UNIVERSITY VETERINARIAN:

A. Chair – Susan McRae, Ph.D.

1. Dr. Mary Farwell, the new Institutional Official (IO) effective September 1st, was introduced to the committee.
2. [redacted], a new committee member, was also introduced to the committee.
3. [redacted].
4. Renewal training will begin soon
5. TB skin tests were given in Prospective Health before the meeting
6. Inspection assignments were discussed and reports are due at the October meeting.
7. Spring meeting dates were discussed
8. Dr. McRae discussed the fall retreat and will have more details later.
9. The committee reviewed and approved the Annual Reviews for AUP #'s

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Appendix 8: IACUC/OB Minutes

D314a, T264a, A199, K173, W247a, A200, K147d, D281b, Q353, K167a, and J199c. *Dr. O'Rourke was recused from review and discussion of A199. Dr. McRae was recused from review and discussion of D281b.* [redacted] *were recused from review and discussion of K167a.*

B. University Veterinarian – Dorcas O'Rourke, D.V.M.

1. Dr. O'Rourke gave an update on the upcoming AAALAC site visit and the HVAC data is being collected now.
2. The Rule on Veterinary Formularies was reviewed and approved by the committee. Committee members were able to review all the references located in the DCM library before this meeting.
3. Dr. O'Rourke discussed the recent hurricane and that two technicians volunteered to stay overnight. The day after the hurricane emergency power was taken down and a leak was found in a [redacted] animal room but the animals were moved and there were no issues
4. The IACUC office is moving to [redacted]
5. Dr. O'Rourke discussed the recent FOIA and what information was being requested
6. [redacted] discussed a sick animal report and possible non-compliance. Dr. McRae will e-mail the two PIs involved to request an amendment and to relay the seriousness of the situation
7. [redacted] presented the subcommittee findings of AUPs as related to grant review and possible non-compliance for an unapproved study/procedure. The subcommittee met with the PI (to include [redacted] and a revised protocol was submitted for review at today's meeting.

III. NEW BUSINESS:

A. Review of Animal Use Protocols

1. The following Animal Use Protocol was approved following designated review:

[redacted]

2. The following Animal Use Protocols were approved:

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[redacted]

3. The following Animal Use Protocols require modifications to secure approval. *Designated review of modifications per IACUC SOP will occur unless specified otherwise:*

[redacted]

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Appendix 8: IACUC/OB Minutes

[redacted]

B. Review of Research Proposals

1. The following Research Proposal was approved following approval of amendments to matching protocols:

[redacted]

2. The following Research Proposals were approved following designated reviews:

[redacted]

The meeting was adjourned at 3:50pm.

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Appendix 8: IACUC/OB Minutes

[redacted]
Coordinator, Animal Care and Use Committee

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Appendix 8: IACUC/OB Minutes

Minority Opinions: None

[redacted]

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Appendix 8: IACUC/OB Minutes

ANIMAL CARE AND USE COMMITTEE MEETING MINUTES

October 21, 2019 **Page 1**

I. OPENING:

The Animal Care and Use Committee met at 1:00pm on Monday, October 21, 2019, in [redacted]. Dr. Susan McRae presided with the following members in attendance: [redacted] The Animal Care and Use Committee minutes from the September 16, 2019 meeting were read and unanimously approved. The next meeting is scheduled for November 18, 2019 at 1:00.

II. REPORTS FROM CHAIR AND UNIVERSITY VETERINARIAN:

C. Chair – Susan McRae, Ph.D.

10. [redacted].
11. The committee thanked [redacted] for their service to the committee.
12. Following the meeting, [redacted] were trained as new IACUC members by Drs. O'Rourke and McRae.
13. Renewal training is due November 15th
14. Semi-annual inspection assignments were discussed and approved with some minor edits by the committee.
15. The letter to the IO, Dr. Mary Farwell, in reference to the semiannual animal care and use facility inspections and program evaluation, was approved and signed by the committee. The list of Departures/Exceptions from the PHS Policy, the Guide, and the AWA was attached.

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Appendix 8: IACUC/OB Minutes

16. The IACUC retreat will be held on December 6th at the CSI facility on Roanoke Island
17. Several administrative approvals were discussed.
18. The committee reviewed and approved the [redacted]

D. University Veterinarian – Dorcas O'Rourke, D.V.M.

8. Dr. O'Rourke gave an update on the upcoming AAALAC site visit
9. The revised IACUC Animal Use Protocol Review form was reviewed and approved by the committee.
10. The 2019 PHS Assurance was reviewed and approved by the committee.
11. NABR webinar "Cautionary Tails: FOIA and Other Threats to Sustainability of Animal Research" on October 29th, 12:30pm
12. Dr. O'Rourke discussed the recent FOIA and since ECU did not have a list serv or shared sites, the request was dropped.

III. NEW BUSINESS:

A. Review of Animal Use Protocols

4. The following Animal Use Protocols were approved:

[redacted]

5. The following Animal Use Protocols require modifications to secure approval. *Designated review of modifications per IACUC SOP will occur unless specified otherwise:*

[redacted]

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Appendix 8: IACUC/OB Minutes

[redacted]

The meeting was adjourned at 3:05pm.

[redacted]
Coordinator, Animal Care and Use Committee

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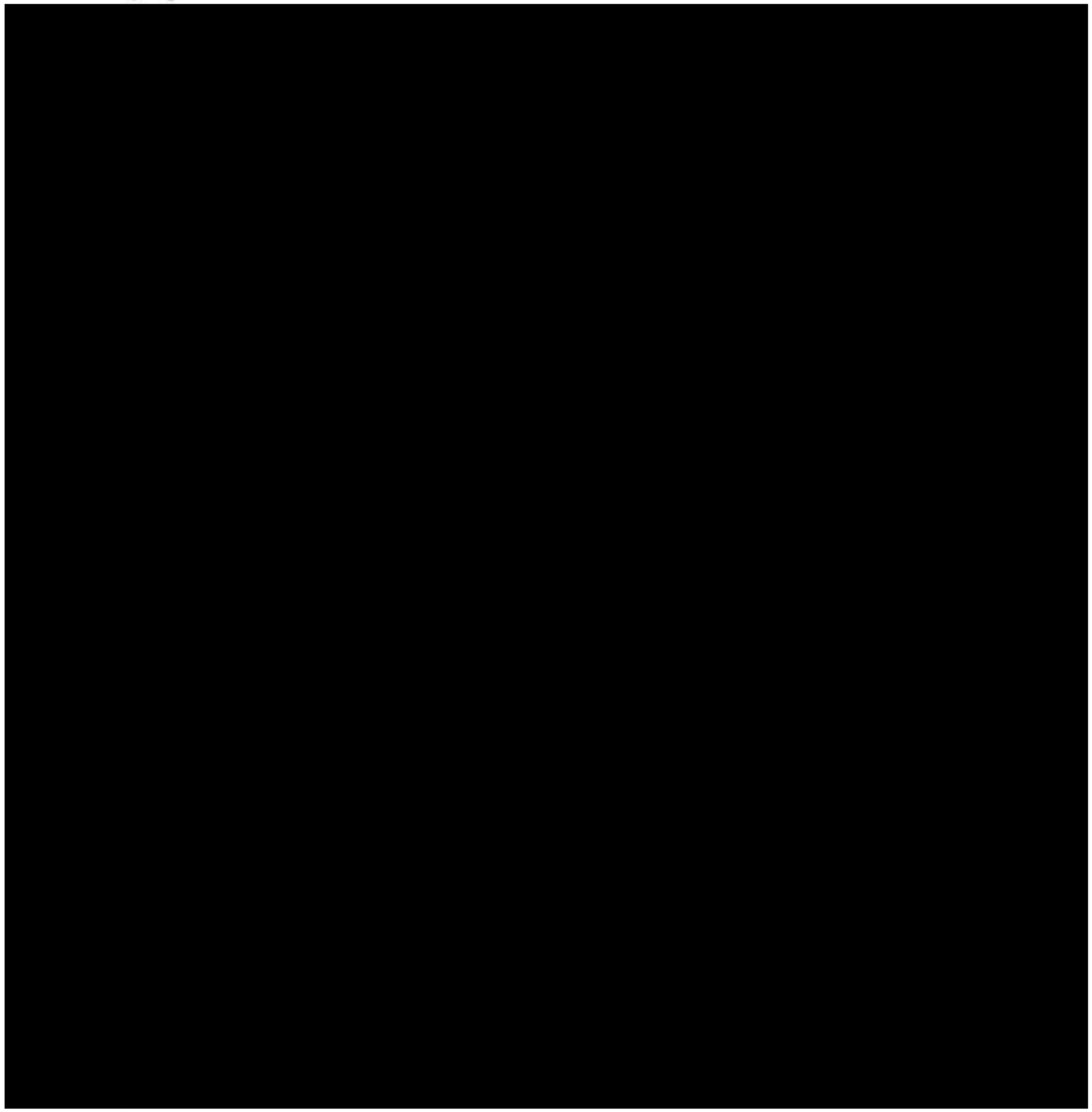
Appendix 8: IACUC/OB Minutes

Minority Opinions: None



Appendix 9: IACUC/OB Protocol Form

Please attach a ***blank*** copy of form(s) used by the IACUC/OB to review and approve studies. Include forms used for annual (or other periodic) renewal, modifications, amendments, etc., as applicable.

EAST CAROLINA UNIVERSITY
ANIMAL USE PROTOCOL (AUP) FORM
LATEST REVISION APRIL, 2017

Project Title:

Click here to enter text.

	Principal Investigator	Secondary Contact
Name	Click here to enter text.	Click here to enter text.
Dept.	Click here to enter text.	Click here to enter text.
Office Ph #	Click here to enter text.	Click here to enter text.
Cell Ph #	Click here to enter text.	Click here to enter text.
Pager #	Click here to enter text.	Click here to enter text.
Home Ph #	Click here to enter text.	Click here to enter text.
Email	Click here to enter text.	Click here to enter text.

For IACUC Use Only

AUP #			

Appendix 9: IACUC/OB Protocol Form

New/Renewal			
Full Review/Date	DR/Date		
Approval Date			
Study Type			
Pain/Distress Category			
Surgery	Survival	Multiple	
Prolonged Restraint			
Food/Fluid Regulation			
Other			
Hazard Approval/Dates	Rad	IBC	EHS
OHP Enrollment			
Mandatory Training			
Amendments Approved			

I. Personnel

A. Principal Investigator(s):

Click here to enter text.

B. Department(s):

Click here to enter text.

C. List all personnel (PI's, co-investigators, technicians, students) that will be working with live animals and describe their qualifications and experience with these specific procedures. If people are to be trained, indicate by whom:

Name/Degree/Certification	Position/Role(s)/ Responsibilities in this Project	Required Online IACUC	Relevant Animal Experience/Training (include

		Training (Yes/No)	species, procedures, number of years, etc.)
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Choose an item.	Click here to enter text.

II. Regulatory Compliance

A. Non-Technical Summary

Using language a non-scientist would understand, please provide a clear, concise, and sequential description of animal use. Additionally, explain the overall study objectives and benefits of proposed research or teaching activity to the advancement of knowledge, human or animal health, or good of society. (More detailed procedures are requested later in the AUP.)

Do not cut and paste the grant abstract.

Appendix 9: IACUC/OB Protocol Form

Click here to enter text.

B. Ethics and Animal Use

B.1. Duplication

Does this study duplicate existing research? Choose an item.

If yes, why is it necessary? (note: teaching by definition is duplicative)

Click here to enter text.

B.2. Alternatives to the Use of Live Animals

Are there less invasive procedures, other less sentient species, isolated organ preparation, cell or tissue culture, or computer simulation that can be used in place of the live vertebrate species proposed here? Choose an item.

If yes, please explain why you cannot use these alternatives.

Click here to enter text.

B.3. Consideration of Alternatives to Painful/Distressful Procedures

a. Include a literature search to ensure that alternatives to all procedures that may cause more than momentary or slight pain or distress to the animals have been considered.

1. Please list all of the potentially painful or distressful procedures in the protocol:

Click here to enter text.

2. For the procedures listed above, provide the following information (please do not submit search results but retain them for your records):

Date Search was performed:	Click here to enter text.
Database(s) searched:	Click here to enter text.
Time period covered by the search (i.e. 1975-2013):	Click here to enter text.

Search strategy (including scientifically relevant terminology):	Click here to enter text.
Other sources consulted:	Click here to enter text.

3. In a few sentences, please provide a brief narrative indicating the results of the search(es) to determine the availability of alternatives and explain why these alternatives were not chosen. Also, please address the 3 Rs of refinement, reduction, and replacement in your response. Refinement refers to modification of husbandry or experimental procedures to enhance animal well-being and minimize or eliminate pain and distress. Replacement refers to absolute (i.e. replacing animals with an inanimate system) or relative (i.e. using less sentient species) replacement. Reduction involves strategies such as experimental design analysis, application of newer technologies, use of appropriate statistical methods, etc., to use the fewest animals or maximize information without increasing animal pain or distress.

Click here to enter text.

C. Hazardous Agents

1. **Protocol related hazards (chemical, biological, or radiological):**

Please indicate if any of the following are used in animals and the status of review/approval by the referenced committees:

HAZARDS	Oversight Committee	Status (Approved, Pending, Submitted)/Date	AUP Appendix I Completed?
Radioisotopes	**Radiation**	Click here to enter text.	Choose an item.
Ionizing radiation	**Radiation**	Click here to enter text.	Choose an item.
Infectious agents (bacteria, viruses, rickettsia, prions, etc.)	**IBC**	Click here to enter text.	Choose an item.
Toxins of biological origins (venoms, plant toxins, etc.)	**IBC**	Click here to enter text.	Choose an item.

Transgenic, Knock In, Knock Out Animals---breeding, cross breeding or any use of live animals or tissues	**IBC**	Click here to enter text.	Choose an item.
Human tissues, cells, body fluids, cell lines	**IBC**	Click here to enter text.	Choose an item.
Viral/Plasmid Vectors/Recombinant DNA or recombinant techniques	**IBC**	Click here to enter text.	Choose an item.
Oncogenic/toxic/mutagenic chemical agents	**EH&S**	Click here to enter text.	Choose an item.
Nanoparticles	**EH&S**	Click here to enter text.	Choose an item.
Cell lines, tissues or other biological products injected or implanted in animals	**DCM**	Click here to enter text.	Choose an item.
Other agents		Click here to enter text.	Choose an item.

2. Incidental hazards

Will personnel be exposed to any incidental zoonotic diseases or hazards during the study (field studies, primate work, etc)? If so, please identify each and explain steps taken to mitigate risk:

Click here to enter text.

III. Animals and Housing

A. Species and strains:

Click here to enter text.

B. Weight, sex and/or age:

Click here to enter text.

C. Animal numbers:

Appendix 9: IACUC/OB Protocol Form

1. Please complete the following table:

Total number of animals in treatment and control groups	**Additional animals (Breeders, substitute animals)**	**Total number of animals used for this project**
Click here to enter text.	+Click here to enter text.	=Click here to enter text.

2. Justify the species and number (use statistical justification when possible) of animals requested:
Click here to enter text.

3. Justify the number and use of any additional animals needed for this study:
Click here to enter text.

a. For unforeseen outcomes/complications:
Click here to enter text.

b. For refining techniques:
Click here to enter text.

c. For breeding situations, briefly justify breeding configurations and offspring expected:
Click here to enter text.

d. Indicate if following IACUC tail snip guidelines: Choose an item.
(if no, describe and justify)
Click here to enter text.

4. Will the phenotype of mutant, transgenic or knockout animals predispose them to any health, behavioral, physical abnormalities, or cause debilitating effects in experimental manipulations? Choose an item. **(if yes, describe)**
Click here to enter text.

5. Are there any deviations from standard husbandry practices?
Choose an item. **If yes, then describe conditions and justify the exceptions to standard housing (temperature, light cycles, sterile cages, special feed, prolonged weaning times, wire-bottom cages, etc.):**
Click here to enter text.

6. The default housing method for social species is pair or group housing (including mice, rats, guinea pigs, rabbits, dogs, pigs, monkeys). Is it necessary for animals to be singly housed at any time during the study?
Choose an item. **(If yes, describe housing and justify the need to singly house social species):**

Click here to enter text.

7. Are there experimental or scientific reasons why routine environmental enrichment should not be provided?

Choose an item.

(If yes, describe and justify the need to withhold enrichment)

Click here to enter text.

8. If wild animals will be captured or used, provide permissions (collection permit # or other required information):

Click here to enter text.

9. List all laboratories or locations outside the animal facility where animals will be used. Note that animals may not stay in areas outside the animal facilities for more than 12 hours without prior IACUC approval. For field studies, list location of work/study site.

Click here to enter text.

IV. Animal Procedures

A. Outline the Experimental Design including all treatment and control groups and the number of animals in each. Tables or flow charts are particularly useful to communicate your design. Briefly state surgical plans in this section. Surgical procedures can be described in detail in IV.S.

Click here to enter text.

In sections IV.B-IV.S below, please respond to all items relating to your proposed animal procedures. If a section does not apply to your experimental plans, please leave it blank.

Please refer to DCM and IACUC websites for relevant guidelines and SOPs.

B. Anesthesia/Analgesia/Tranquilization/Pain/Distress Management For Procedures Other than Surgery:

For all procedures, provision of pre-emptive (pre-procedural) analgesia is required, unless specifically exempted by DCM veterinarians. For major survival surgical procedures and extensive non-surgical procedures requiring anesthesia, post-procedural analgesia must be provided for a minimum of 3 full days following anesthetic recovery,

unless specifically exempted by DCM veterinarians. Analgesic administration should be continued for at least 1 full day following recovery from minor surgical and non-surgical procedures. Please contact DCM veterinary staff for recommendations and guidance when formulating anesthetic regimens.

Adequate records describing anesthetic monitoring and recovery must be maintained for all species. Please see Guidelines for Intra-operative and Intra-procedural Monitoring on the IACUC website.

If anesthesia/analgesia must be withheld for scientific reasons, please provide compelling scientific justification as to why this is necessary:

Click here to enter text.

1. Describe the pre-procedural preparation of the animals:

a. Food restricted for Click here to enter text. **hours**

b. Food restriction is not recommended for rodents and rabbits and must be justified:

Click here to enter text.

c. Water restricted for Click here to enter text. **hours**

d. Water restriction is not recommended in any species for routine pre-op prep and must be justified:

Click here to enter text.

2. Anesthesia/Analgesia *for Procedures Other than Surgery*

	Agent	Concentration	Dose (mg/kg)	Max Volume	Route	Frequency	Number of days administered
Pre-procedure analgesic	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Pre-anesthetic	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

Anesthetic	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Post procedure analgesic	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Other	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

3. Reason for administering agent(s):

Click here to enter text.

4. For which procedure(s):

Click here to enter text.

5. Methods for monitoring anesthetic depth:

Click here to enter text.

6. Methods of physiologic support during anesthesia and recovery:

Click here to enter text.

7. Duration of recovery:

Click here to enter text.

8. Frequency of recovering monitoring:

Click here to enter text.

9. Specifically what will be monitored?

Click here to enter text.

10. When will animals be returned to their home environment?

Click here to enter text.

11. Describe any behavioral or husbandry manipulations that will be used to alleviate pain, distress, and/or discomfort:

Click here to enter text.

C. Use of Paralytics

1. Will paralyzing drugs be used? Choose an item

2. For what purpose:

Click here to enter text.

3. Please provide scientific justification for paralytic use:

Click here to enter text.

4. Paralytic drug:

Click here to enter text.

5. Dose:

Click here to enter text.

6. Method of ensuring appropriate analgesia during paralysis:

Click here to enter text.

D. Blood or Body Fluid Collection

1. Please fill out appropriate sections of the chart below:

	Location on animal	Needle/catheter size	Volume collected	Frequency of procedure	Time interval between collections

Blood Collection	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Body Fluid Collection	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Other	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

E. Injections, Gavage, & Other Substance Administration

1. Please fill out appropriate sections of the chart below:

	Compound	Location & Route of admin	Needle/catheter/gavage size	Max volume admin	Freq of admin (ie two times per day)	Number of days admin (ie for 5 days)	Max dosages (mg/kg)
Injection/ Infusion	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Gavage	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Other	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

3. Pharmaceutical grade drugs, biologics, reagents, and compounds are defined as agents approved by the Food and Drug Administration (FDA) or for which a chemical purity standard has been written/established by any recognized pharmacopeia such as USP, NF, BP, etc. These standards are used by manufacturers to help ensure that the products are of the appropriate chemical purity and quality, in the appropriate solution or compound, to ensure stability, safety, and efficacy. For all injections and infusions for CLINICAL USE, PHARMACEUTICAL

GRADE compounds must be used whenever possible. Pharmaceutical grade injections and infusions for research test articles are preferred when available. If pharmaceutical grade compounds are not available and non-pharmaceutical grade agents must be used, then the following information is necessary:

a. **Please provide a scientific justification for the use of ALL non-pharmaceutical grade compounds. This may include pharmaceutical-grade compound(s) that are not available in the appropriate concentration or formulation, or the appropriate vehicle control is unavailable.**
b. **Indicate the method of preparation, addressing items such as purity, sterility, pH, osmolality, pyrogenicity, adverse reactions, etc. (please refer to ECU IACUC guidelines for non-pharmaceutical grade compound use), labeling (i.e. preparation and use-by dates), administration and storage of each formulation that maintains stability and quality/sterility of the compound(s).**

Click here to enter text.

F. Prolonged restraint with mechanical devices

Prolonged restraint in this context means *beyond routine care and use procedures* for rodent and rabbit restrainers, and large animal stocks. Prolonged restraint also includes *any* use of slings, tethers, metabolic crates, inhalation chambers, primate chairs and radiation exposure restraint devices.

1. For what procedure(s):

Click here to enter text.

2. Explain why non-restraint alternatives cannot be utilized:

Click here to enter text.

3. Restraint device(s):

Click here to enter text.

4. Duration of restraint:

Click here to enter text.

5. Frequency of observations during restraint/person responsible:

Click here to enter text.

6. Frequency and total number of restraints:

Click here to enter text.

7. Conditioning procedures:

Click here to enter text.

8. Steps to assure comfort and well-being:

Click here to enter text.

9. Describe potential adverse effects of prolonged restraint and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

G. Tumor Studies, Disease Models, Toxicity Testing, Vaccine Studies, Trauma Studies, Pain Studies, Organ or System Failure Studies, Shock Models, etc.

1. Describe methodology:

Click here to enter text.

2. Expected model and/or clinical/pathological manifestations:

Click here to enter text.

3. Signs of pain/discomfort:

Click here to enter text.

4. Frequency of observations:

Click here to enter text.

5. Describe potential adverse side effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

H. Treadmills/Swimming/Forced Exercise

1. Describe aversive stimulus (if used):

Click here to enter text.

2. Conditioning:

Click here to enter text.

3. Safeguards to protect animal:

Click here to enter text.

4. Duration:

Click here to enter text.

5. Frequency:

Click here to enter text.

6. Total number of sessions:

Click here to enter text.

7. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

I. Projects Involving Food and Water Regulation or Dietary Manipulation

(*Routine pre-surgical fasting not relevant for this section)*

1. Food Regulation

a. Amount regulated and rationale:

Click here to enter text.

b. Frequency and duration of regulation (hours for short term/weeks or months for long term):

Click here to enter text.

c. Frequency of observation/parameters documented (i.e. recording body weight, body condition, etc.):

Click here to enter text.

d. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

2. Fluid Regulation

a. Amount regulated and rationale:

Click here to enter text.

b. Frequency and duration of regulation (hours for short term/weeks or months for long term):

Click here to enter text.

c. Frequency of observation/parameters documented (body weight, hydration status, etc.):

Click here to enter text.

d. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

3. Dietary Manipulations

a. Compound supplemented/deleted and amount:

Click here to enter text.

b. Frequency and duration (hours for short term/week or month for long term):

Click here to enter text.

c. Frequency of observation/parameters documented:

Click here to enter text.

d. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

J. Endoscopy, Fluoroscopy, X-Ray, Ultrasound, MRI, CT, PET, Other Imaging

1. Describe animal methodology:

Click here to enter text.

2. Duration of procedure:

Click here to enter text.

3. Frequency of observations during procedure:
Click here to enter text.
4. Frequency/total number of procedures:
Click here to enter text.
5. Method of transport to/from procedure area:
Click here to enter text.
6. Describe potential adverse side effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):
Click here to enter text.
7. Please provide or attach appropriate permissions/procedures for animal use on human equipment:
Click here to enter text.

K. Polyclonal Antibody Production

1. **Antigen/adjuvant used and justification for adjuvant choice:**

Click here to enter text.

2. **Needle size:**

Click here to enter text.

3. **Route of injection:**

Click here to enter text.

4. **Site of injection:**

Click here to enter text.

5. **Volume of injection:**

Click here to enter text.

6. Total number of injection sites:
Click here to enter text.
7. Frequency and total number of boosts:
Click here to enter text.
8. What will be done to minimize pain/distress:
Click here to enter text.

9. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

L. Monoclonal Antibody Production

1. Describe methodology:

Click here to enter text.

2. Is pristane used: Choose an item.

Volume of pristane:

Click here to enter text.

3. Will ascites be generated: Choose an item.

i. Criteria/signs that will dictate ascites harvest:

Click here to enter text.

ii. Size of needle for taps:

Click here to enter text.

iii. Total number of taps:

Click here to enter text.

iv. How will animals be monitored/cared for following taps:

Click here to enter text.

4. What will be done to minimize pain/distress:

Click here to enter text.

5. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

M. Temperature/Light/Environmental Manipulations

1. Describe manipulation(s):

Click here to enter text.

2. Duration:

Click here to enter text.

3. Intensity:

Click here to enter text.

4. Frequency:

Click here to enter text.

5. Frequency of observations/parameters documented:

Click here to enter text.

6. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

N. Behavioral Studies

1. **Describe methodology/test(s) used:**

Click here to enter text.

2. **Will conditioning occur? If so, describe:**

Click here to enter text.

3. If aversive stimulus used, frequency, intensity and duration:

Click here to enter text.

4. Length of time in test apparatus/test situation: *(i.e., each test is ~10 mins)*

Click here to enter text.

5. Frequency of testing and duration of study: *(i.e., 5 tests/week for 6 months)*

Click here to enter text.

6. Frequency of observation/monitoring during test:

Click here to enter text.

7. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

O. Capture with Mechanical Devices/Traps/Nets

1. **Description of capture device/method:**

Click here to enter text.

2. Maximum time animal will be in capture device:

Click here to enter text.

3. Frequency of checking capture device:

Click here to enter text.

4. Methods to ensure well-being of animals in capture device:

Click here to enter text.

5. Methods to avoid non-target species capture:

Click here to enter text.

6. Method of transport to laboratory/field station/processing site and duration of transport:

Click here to enter text.

7. Methods to ensure animal well-being during transport:

Click here to enter text.

8. Expected mortality rates:

Click here to enter text.

9. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

P. Manipulation of Wild-Caught Animals in the Field or Laboratory

1. **Parameters to be measured/collected:**

Click here to enter text.

2. **Approximate time required for data collection per animal:**

Click here to enter text.

3. **Method of restraint for data collection:**

Click here to enter text.

4. **Methods to ensure animal well-being during processing:**

Click here to enter text.

5. **Disposition of animals post-processing:**

Click here to enter text.

6. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

Q. Wildlife Telemetry/Other Marking Methods

1. Describe methodology (including description of device):

Click here to enter text.

2. Will telemetry device/tags/etc. be removed? Choose an item. **If so, describe:**

Click here to enter text.

3. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

R. Other Animal Manipulations

1. **Describe methodology:**

Click here to enter text.

2. Describe methods to ensure animal comfort and well-being:

Click here to enter text.

3. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):

Click here to enter text.

S. Surgical Procedures

Appendix 9: IACUC/OB Protocol Form

All survival surgical procedures must be done aseptically, regardless of species or location of surgery. Adequate records describing surgical procedures, anesthetic monitoring and postoperative care must be maintained for all species. Please see Guidelines for Intra-operative and Intra-procedural Monitoring on the IACUC website.

1. Location of Surgery (Building & Room #):
Click here to enter text.

2. Type of Surgery (check all that are appropriate):
Click here to enter text.

☐ **Non-survival surgery (animals euthanized without regaining consciousness)**
☐ **Major survival surgery (major surgery penetrates and exposes a body cavity or produces substantial impairment of physical or physiologic function)**
☐ **Minor survival surgery**
☐ **Multiple survival surgery**
If yes, provide scientific justification for multiple survival surgical procedures:
Click here to enter text.

3. Describe the pre-op preparation of the animals:

a. **Food restricted for** Click here to enter text. **hours**
b. **Food restricted is not recommended for rodents and rabbits and must be justified:**

Click here to enter text.
c. Water restricted for Click here to enter text. **hours**
d. Water restriction is not recommended in any species for routine pre-op prep and be justified:
Click here to enter text.

4. Minimal sterile techniques will include (check all that apply):

Please refer to DCM Guidelines for Aseptic Surgery for specific information on what is required for each species and type of surgery (survival vs. non-survival).

☐ **Sterile instruments**

How will instruments be sterilized?

Click here to enter text.

If serial surgeries are done, how will instruments be sterilized between surgeries:

Click here to enter text.

☐ **Sterile gloves**
☐ **Mask**
☐ **Cap**
☐ **Sterile gown**
☐ **Sanitized operating area**
☐ **Clipping or plucking of hair or feathers**
☐ **Skin preparation with a sterilant such as betadine**
☐ **Practices to maintain sterility of instruments during surgery**
☐ **Non-survival (clean gloves, clean instruments, etc.)**

5. Describe all surgical procedures:

a. Skin incision size and site on the animal:

Click here to enter text.

b. Describe surgery in detail (include size of implant if applicable):

Click here to enter text.

c. Method of wound closure:

Click here to enter text.

i. Number of layers

Click here to enter text.

ii. Type of wound closure and suture pattern:

Click here to enter text.

iii. Suture type/size/wound clips/tissue glue:

Click here to enter text.

iv. Plan for removing of skin sutures/wound clip/etc:

Click here to enter text.

6. Anesthetic Protocol:

For all procedures, provision of pre-emptive (pre-procedural) analgesia is required, unless specifically exempted by DCM veterinarians. For major survival surgical procedures and extensive non-surgical procedures requiring anesthesia, post-procedural analgesia must be provided for a minimum of 3 full days following anesthetic recovery, unless specifically exempted by DCM veterinarians. Analgesic administration should be continued for at least 1 full day following recovery from minor surgical and non-surgical procedures. Please contact DCM veterinary staff for recommendations and guidance when formulating anesthetic regimens.

a. If anesthesia/analgesia must be withheld for scientific reasons, please provide compelling scientific justification as to why this is necessary:

Click here to enter text.

b. Anesthesia/Analgesia For Surgical Procedures

	Agent	Dose (mg/kg or %)	Volume	Route	Frequency	Number of days administered
Pre-operative analgesic	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Pre-anesthetic	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

c.

Anesthetic	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Post-operative Analgesic	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Other	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

Methods that will be used to monitor anesthetic depth (include extra measures employed when paralyzing agents are used):

Click here to enter text.

d. Methods of physiologic support during anesthesia and immediate post-op period (fluids, warming, etc.):

Click here to enter text.

e. List what parameters are monitored during immediate post-op period. Provide the frequency and duration:

Click here to enter text.

f. Describe any other manipulations that will be used to alleviate pain, distress, and/or discomfort during the immediate post-op period (soft bedding, long sipper tubes, food on floor, dough diet, etc.):

Click here to enter text.

g. List criteria used to determine when animals are adequately recovered from anesthesia and when the animals can be returned to their home environment:

Click here to enter text.

7. Recovery from Surgical Manipulations (after animal regains consciousness and is returned to its home environment)

Click here to enter text.

a. What parameters (behavior, appetite, mobility, wound healing, etc.) will be monitored:

Click here to enter text.

b. How frequently (times per day) will animals be monitored:

Click here to enter text.

c. How long post-operatively (days) will animals be monitored:

Click here to enter text.

8. Surgical Manipulations Affecting Animals

a. Describe any signs of pain/discomfort/functional deficits resulting from the surgical procedure:
Click here to enter text.

b. What will be done to manage any signs of pain or discomfort (include pharmacologic and non-pharmacologic interventions):
Click here to enter text.

c. Describe potential adverse effects of procedures and provide humane endpoints (criteria for either humanely euthanizing or otherwise removing from study):
Click here to enter text.

V. Euthanasia

Please refer to the AVMA Guidelines for the Euthanasia of Animals: 2013 Edition and DCM Guidelines to determine appropriate euthanasia methods.

A. Euthanasia Procedure. ***All investigators, even those conducting non-terminal studies, must complete this section in case euthanasia is required for humane reasons.***

1. Physical Method- If a physical method is used, the animal should be first sedated/anesthetized with CO_2 or other anesthetic agent. If prior sedation is not possible, a scientific justification must be provided:
Click here to enter text.

2. Inhalant Method- Choose an item.
(if other, describe the agent and delivery method)
Click here to enter text.

3. Non-Inhalant Pharmaceutical Method (injectables, MS-222, etc.)- Please provide the following:

Appendix 9: IACUC/OB Protocol Form

a. Agent:

Click here to enter text.

b. Dose or concentration:

Click here to enter text.

c. Route:

Click here to enter text.

B. Method of ensuring death (can be physical method, such as pneumothorax or decapitation for small species and assessment method such as auscultation for large animals):

Click here to enter text.

C. Describe disposition of carcass following euthanasia:

Click here to enter text.

Appendix 9: IACUC/OB Protocol Form

I acknowledge that humane care and use of animals in research, teaching and testing is of paramount importance, and agree to conduct animal studies with professionalism, using ethical principles of sound animal stewardship. I further acknowledge that I will perform only those procedures that are described in this AUP and that my use of animals must conform to the standards described in the Animal Welfare Act, the Public Health Service Policy, The Guide For the Care and Use of Laboratory Animals, the Association for the Assessment and Accreditation of Laboratory Animal Care, and East Carolina University.

Please submit the completed animal use protocol form via e-mail attachment to iacuc@ecu.edu. You must also carbon copy your Department Chair.

PI Signature: _____ Date: _____

Veterinarian:_____Date:_____

IACUC Chair: _____Date:_____

Appendix 9: IACUC/OB Protocol Form

APPENDIX 1-HAZARDOUS AGENTS			
Principal Investigator:	Campus Phone:	Home Phone:	
IACUC Protocol Number:	Department:	E-Mail:	
Secondary Contact: Department:	Campus Phone:	Home Phone:	E-Mail:
Chemical Agents used:	Radioisotopes used:		
Biohazardous Agents used:	Animal Biosafety Level:	Infectious to humans?	
PERSONAL PROTECTIVE EQUIPMENT REQUIRED:			
Route of Excretion:			
Precautions for Handling Live or Dead Animals:			
Animal Disposal:			
Bedding/Waste Disposal:			
Cage Decontamination:			
Additional Precautions to Protect Personnel, Adjacent Research Projects including Animals and the Environment:			

Appendix 9: IACUC/OB Protocol Form

Initial Approval Safety/Subject Matter Expert Signature & Date _____	

Appendix 10: IACUC/OB Periodic Report

Please attached a copy of the latest facilities (including laboratory inspections) and program assessment report conducted by the IACUC/OB .

Memorandum to: Mary Farwell, Ph.D.
Assistant Vice Chancellor for Research Compliance

From: Institutional Animal Care and Use Committee

Subject: Semiannual Report of the Program Review and Facility Inspection

Date: October 21, 2019

This report summarizes the IACUC's results of its most recent program review and facility inspection, as required by the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals (Policy), Section IV.B.1.-3., the *Guide for the Care and Use of Laboratory Animals* (*Guide*), and the Animal Welfare Act (AWA) regulations, as applicable. Submission of semiannual reports to the Institutional Official is a condition of this institution's Animal Welfare Assurance with the NIH Office of Laboratory Animal Welfare (OLAW).

Since the last review, the following changes have occurred in the institution's program for animal care and use (PHS Policy IV.A.1.a.-i.): [*optional*]

[redacted] **as the senior administrative officer of East Carolina University, has appointed in writing Mary Farwell Assistant Vice Chancellor for Research Compliance to the position of Institutional Official (IO), effective September 1, 2019.**

I. Description of the Nature and Extent of the Institution's Adherence to the PHS Policy, the *Guide*, and the AWA

Departures from the PHS Policy, the *Guide*, and the AWA.
Select A or B:
[ ] A. There were no departures during this reporting period.
[X] B. The following departures have been reviewed and approved by the IACUC: [*include reason for each departure*]

See attached list of all approved departures

II. Deficiencies in the Institution's Animal Care and Use Program

Animal Care and Use Program Review Date(s): **September 30, 2019**
Select A or B:
[X] A. There were no deficiencies in the program during this reporting period.
[ ] B. The following deficiencies have been identified: [*describe each deficiency, identify each deficiency as either minor or significant, and provide a reasonable and specific plan and schedule for the correction of each deficiency, deficiencies may be recorded on a separate table and attached, the last page of OLAW's Sample Semiannual Program Review and Facility Inspection Checklist provides a sample table*]

See attached report

Semiannual Report v6/25/2013 1

Appendix 10: IACUC/OB Periodic Report

III. Deficiencies in the Institution's Animal Facility

Animal Facility Inspection Date(s): [redacted] **September 11, 19, and 20, 2019; [redacted] October 3, 2019; [redacted] September 30, 2019; [redacted] – September 26, 2019; [redacted] October 14 and 16, 2019; [redacted] Campus – September 23, 2019; [redacted] October 18, 2019; [redacted] – October 7, 2019**

Select A or B:

[ ] A. There were no deficiencies in the animal facility during this reporting period.

[X] B. The following deficiencies have been identified: [*describe each deficiency, identify each deficiency as either minor or significant, and provide a reasonable and specific plan and schedule for the correction of each deficiency, deficiencies may be recorded on a separate table and attached, the last page of OLAW's Sample Semiannual Program Review and Facility Inspection Checklist provides a sample table*]

See attached reports for the list of minor deficiencies.

IV. Minority Views

Select A or B:

[X] A. No minority views were submitted or expressed.

[ ] B. The following minority views were expressed: [*insert minority views here or attach*]

V. Status of AAALAC Accreditation [*identify accredited facilities, if applicable*]

The program continues to be fully accredited by AAALAC - International

Appendix 10: IACUC/OB Periodic Report

VI. Signatures [*signatures of a majority of the IACUC members required by AWAR (§2.31,c,3), if applicable*]

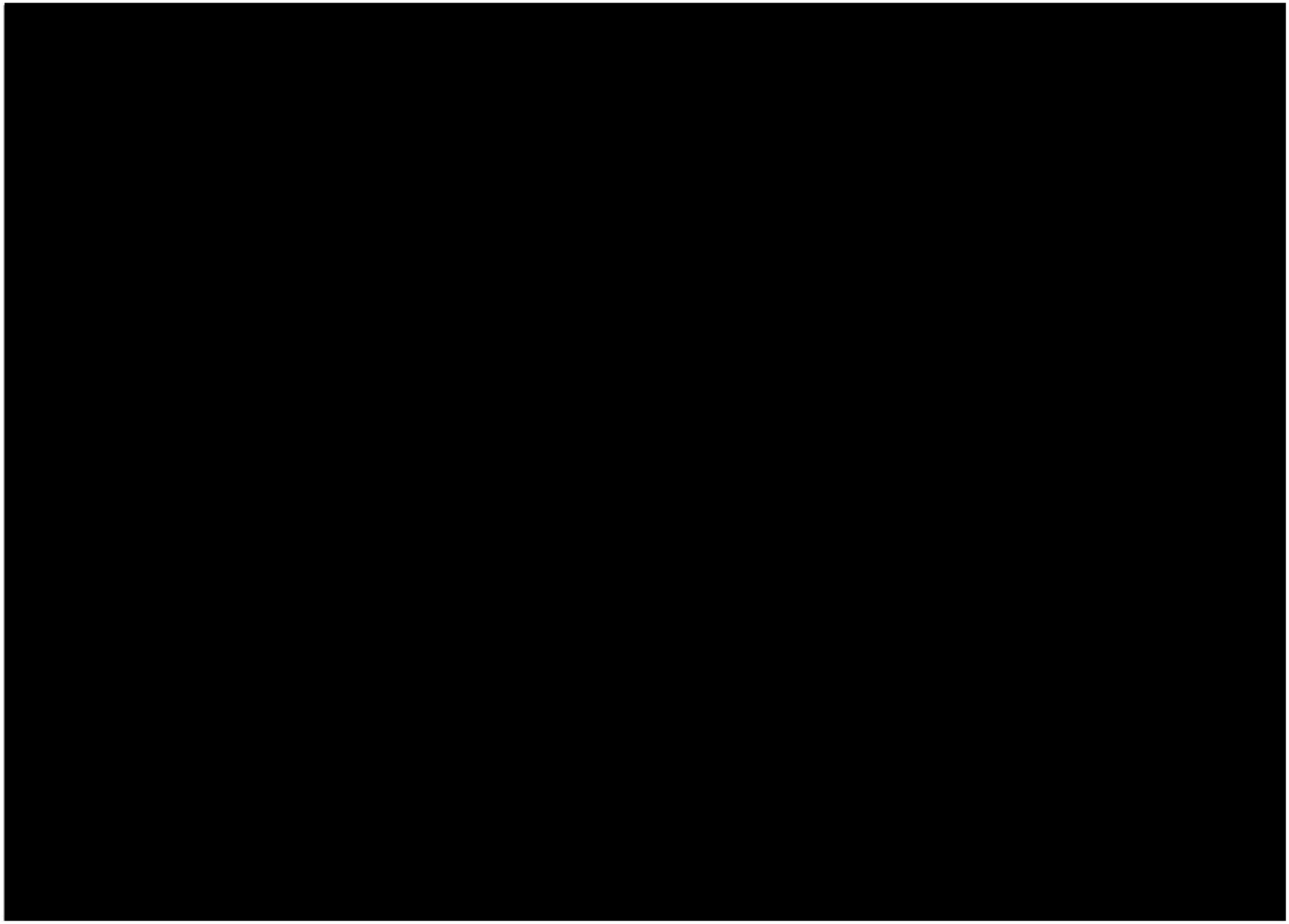
Names of IACUC Members	[redacted]	Signatures
[redacted]		

Appendix 10: IACUC/OB Periodic Report

EXCEPTION TO THE GUIDE 10/10/19

AUP#	Date Approved	Investigator	Exception	Exception To Guide	Rationale	Enrichment W/held
[redacted]						

Appendix 10: IACUC/OB Periodic Report



Appendix 10: IACUC/OB Periodic Report

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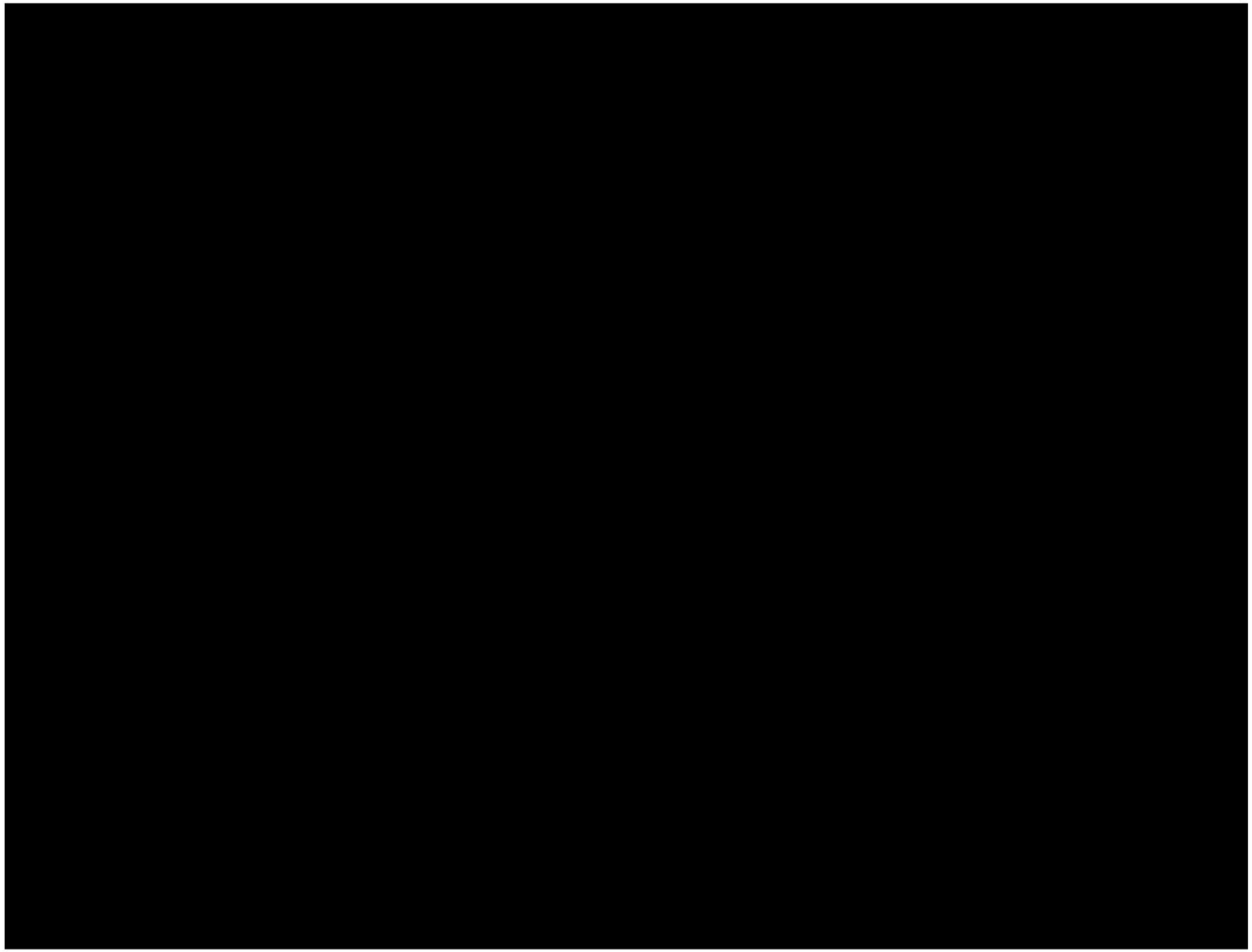

Appendix 10: IACUC/OB Periodic Report

Appendix 10: IACUC/OB Periodic Report

October 15, 2019

Susan McRae, PhD
Chair, Institutional Animal Care and Use Committee
East Carolina University
Greenville, NC 27858

Re: Semiannual review of the Institutional Animal Care and Use Program

Dear Dr. McRae:

On September 30, 2019 a subcommittee of the Institutional Animal Care and Use Committee (IACUC) conducted a semi-annual review of the Animal Care and Use Program at ECU. The following members of the Department of Comparative Medicine (DCM): [redacted]

Using the OLAW Semiannual Program Review Checklist and guided by previous evaluation reports, we conducted a thorough review of the program. We found that the program continues to be well run, the faculty, technical and administrative staff for DCM, and the IACUC continue to do an outstanding job in holding the university's program to a high standard. Proper care and husbandry for the animals are assured by the ACUP currently in place. No major or minor deficiencies in animal care were noted.

Animal Care and Use Program

As mentioned in previous reports funding remains limited, but the program receives support campus wide.

The IACUC retreat has been scheduled for December 6, 2019 and will be held at the Coastal Studies Institute (CSI).

The space turned over to DCM earlier this year is now occupied by the IACUC [redacted] is currently using the office space. Three rooms are being fitted for use as shared procedure spaces, each room will have a fume hood (provided courtesy of Health Sciences and the ECU Space Committee). Further study is being conducted for repurposing the remaining space.

Disaster Planning and Emergency Preparedness

The Emergency Response Plan is complete and being implemented campus-wide. The current satellite facilities [redacted] also have emergency plans in place.

Appendix 10: IACUC/OB Periodic Report

IACUC, Protocol Review, Membership and Functions, Training Records and Reporting Requirements

Composition of the committee will be undergoing change shortly. As noted above, [redacted] Most meetings see full attendance by the membership.

AAALAC will be making their on-campus internal review this fall. The program description is being prepared.

The new IO, Dr. Mary Farwell, appointed by the Chancellor to replace [redacted] was introduced to the committee at a recent meeting.

Although there is limited funding for IACUC, 7 (seven) members were able to attend the 2019 IACUC Conference in Raleigh which was sponsored by the NC Association for Biomedical Research. Members also attend the NABR webinars offered during the year.

Veterinary Care

Staffing: The Department of Comparative Medicine has 3 full-time veterinarians and is currently fully staffed.

Cage Washing: The scheduling of 4 part-time workers dedicated to cage washing is going well. The replacement of the 4 cage rack washers is progressing, but is still being worked on. The emergency showers in the cage wash areas have not been installed as of the time of this review. DCM will follow up with EH&S leadership to resolve this issue by the end of December.

[redacted]

Respectfully submitted,

[redacted]
Unaffiliated Member

Appendix 10: IACUC/OB Periodic Report

Department of Internal Medicine

Brody School of Medicine | Brody Medical Sciences Building | 600 Moye Boulevard
East Carolina University| Greenville, NC 27834-4354
252-744-2570 office | 252-744-3611 fax | www.ecu.edu/internalmedicine

October 8, 2019

Susan McRae, PhD
Department of Biology
Chair, Institutional Animal Care and Use Committee
East Carolina University
Greenville, NC 27858

Dear Dr. McRae,

[redacted]

Since the previous inspection, the principal investigator [redacted] At that time an [redacted]

The AUP itself is part of a skills-based class directed at measuring student reaction to the use of equine assisted learning activities. [redacted] gave a brief outline of the program and the level of student interaction.

[redacted]

As was noted on the last inspection, [redacted] now has a printed copy of the AUP available for her review.

Respectfully submitted,

[redacted]

Appendix 10: IACUC/OB Periodic Report

I. Semiannual Program Review and Facility Inspection Report

Date: October 7, 2019
Members in Attendance: DR. Sue McRae, [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
A		[redacted]	No deficiencies to report	[redacted]		

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

East Carolina University

Department of Biology
Thomas Harriot College of Arts and Sciences
Howell Science Complex
East Carolina University
Greenville, NC 27858-4353

252-328-6716 office
252-328-4178 fax
www.biology.ecu.edu

20 October 2019

Dr. Sue McRae
Chair, Institutional Animal Care and Use Committee
[redacted]
East Carolina University
Greenville, NC 27858

Dear Sue:

On October 18th, 2019, [redacted] and I conducted the IACUC semiannual inspection of [redacted] for a facility tour. As is typically the case, we found the park grounds, buildings, and aviaries to be exceptionally maintained, and its birds in excellent care. We focused on the [redacted] aviary, the new walk-through facility where, among many other birds, finches, waxbills, and wydahs (species under study by ECU researchers) are becoming established residents. [redacted] explained that the building's new heating units, in combination with circulating and exhaust fans, should provide appropriate 'tropical' temperatures throughout fall and winter. This winter will be the test for maintaining temperatures continuously above a lower minimum of 45° F. Should the aviary's temperature drop below 45°, birds will be transferred to smaller, warmer quarters. We also closely examined the [redacted] food prep and food storage facilities; all was in good order.

Respectfully submitted,

[redacted]

East Carolina University is a constituent institution of the University of North Carolina. An equal opportunity university.

Appendix 10: IACUC/OB Periodic Report

From:

[redacted]

To:

Dr. Susan McRae,

Chair, IACUC, ECU, Greenville NC.

Re: Semiannual inspections of [redacted]

Dear Dr. McRae,

On September 23rd, 2019, [redacted] and myself inspected ECU's [redacted] facilities used by PIs approved for animal use by the IACUC. In general, we found the laboratories and animal facilities compliant with IACUC guidelines and research animals well cared for. There were a few deficiencies noted; they are listed and elaborated on in the following OLAW report pages and can be easily remedied. We also request that [redacted] be added to IACUC's inspection list and those rooms no longer in use for animal work (per this report) be removed. Thank you!

Sincerely,

[redacted]

Appendix 10: IACUC/OB Periodic Report

I. Semiannual Program Review and Facility Inspection Report

Date:
Members in Attendance:

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	Cloth chairs cannot be sanitized; replace.	[redacted]	Correct by 12/1/19	
			In freezer – syringe with ID dye exp 1/21/19, please discard. Thank you for housekeeping since the last inspection!		Immediately	
A		[redacted]	No animals in the room.	[redacted]		
M		[redacted]	AUP in the room should be current version. Dead roaches on floor. Missing dates for daily checks and feeding (Correct immediately).	[redacted]	Correct by 11/15/19	
			Repashy Superfood exp 03/17 (Discard immediately). Excessive accumulation of algae inside tanks and on small froglet housing units impedes visualization of animals. Accumulation of debris on top of tanks and on floor. Open bag of moss substrate in room – please place in a sealed container			
M		[redacted]	No animals in the room. Cloth chairs cannot be sanitized; replace.	[redacted]	Correct by 12/1/19	

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

II. Semiannual Program Review and Facility Inspection Report

Date:
Members in Attendance:

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	No deficiencies	[redacted]		
M		[redacted]	No deficiencies			
M			No deficiencies			
M			MS222 shows expiration date of April 2018.		Immediately	
M			Missing several dates for daily checks and feeding.		Immediately	

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

III. Semiannual Program Review and Facility Inspection Report

Date:
Members in Attendance:

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	Cloth chairs cannot be sanitized; replace.	[redacted]	Correct by 12/1/19	
			Should have a log for daily animal checks and care o incubator. Should clean incubator, including removin condensation, and rust (which impedes effective sanitation). Make sure that pads on benchtop where fish-work is done, are clean and changed before animal use.		Immediately	
A			(to transport frogs [redacted] lab).			
			No deficiency			
A			No deficiency			
M			No animals currently. However, lawn mowing needs to be done prior to use.		Prior to use	

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M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

IV. Semiannual Program Review and Facility Inspection Report

Date:
Members in Attendance:

Deficiency Category*	✓	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	Field equipment was stored outside in a haphazard fashion; area should be decluttered and organized.	[redacted]	Correct by 1/1/20	
M			Cloth chairs cannot be sanitized; replace.		Correct by 12/1/19	
			Add daily check, feeding log for incubator.		Immediately	

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
✓ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

I. Semiannual Program Review and Facility Inspection Report

Date:9/11,19,20/2019
Members in Attendance: [redacted]

Deficiency Category*	√ Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M	[redacted]	Replace empty hand soap container	[redacted]	Correct by 11/18/2019	
M		Clean behavior equipment		Correct by 11/18/2019	
M		Please update AUP Appendix 1; capped needle found in sharps container.		Correct by 11/18/2019	
M		Container of expired 10% buffered formalin (12-20-18) was found. Contact EH&S for disposal.		Correct by 11/18/2019	
M		Eye wash log is missing dates.		Immediately	
M		Treadmill needs to be cleaned and blue tape replaced.	[redacted]	Correct by 11/18/2019	

Appendix 10: IACUC/OB Periodic Report

M	[redacted]	Construction paper around cages cannot be disinfected, recommend laminating the paper so it can be cleaned and disinfected or replace paper when soiled.	Correct by 11/18/2019
M		Update emergency contact list to include [redacted]	Correct by 11/18/2019
M		Eyewash not checked since June	Immediately
M		Shattered plastic light cover on the floor must be cleaned up.	Correct by 11/18/2019
M		Eyewash not checked since June	Immediately
M		Isoflurane use should be monitored with a badge.	Correct by 11/18/2019
M	[redacted]	Meloxicam dosing not consistent with AUP #247 (Meloxicam given for 3 days instead of 4). Make sure Meloxicam administration is consistent with AUP and IACUC guidelines.	Immediately
M		Cardboard boxes on the floor need to be moved up off the floor.	Correct by 11/18/2019

Appendix 10: IACUC/OB Periodic Report

M	[redacted]	The date "opened" on IV bag at the time of inspection was 7-18-2019, a maximum of 30 days once opened is recommended. Replace IV bag if longer than 30 days.	[redacted]	Immediately
M		Appendix 1 from AUP J199c needs to be updated.		Correct by 11/18/2019

M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (Include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

Department of Biology
Thomas Harriot College of Arts and Sciences
N-108 Howell Science Complex | Mail Stop 551
East Carolina University | Greenville, NC 27858-4353
252-328-6718 office | 252-328-4178 fax | www.biology.ecu.edu

Sept. 27, 2019

Dr. Dorcas O'Rourke
Attending Veterinarian
Dept. of Comparative Medicine
East Carolina University
Greenville, NC 27858-4353

Dear Dorcas,

On September 26th, 2019, the IACUC subcommittee comprised of [redacted] and myself, toured the [redacted] We found no major deficiencies, and only a small number of minor deficiencies.

We found that the equipment being used for mouse euthanasia using isoflurane and the 'cottonball method' was deficient in two labs. In the [redacted] lab, adult mice and pups were being euthanized using this method in a 50mL Falcon tube in a fumehood, while in the [redacted] lab, mice were anesthetized in the same manner but on an open bench top with potential exposure to personnel. There was no barrier between the mouse and the cottonball, and the small tube size meant there was little space between the mouse and the isoflurane. It was not the first time that members of these labs have been told they cannot perform this procedure in this manner. They were urged to use a dessicator instead, and one was found in the [redacted] lab.

In the [redacted] lab, there was a minor problem that the glass lid of the dessicator that was being used was cracked and taped, which was not sanitizable (and may have allowed volatiles to escape, though it was housed in the fume hood). However, an intact replacement lid was found in the lab and the problem was addressed immediately. One other minor deficiency we found was a bottle of expired saline on a cart that had not been used since before the expiry date.

These issues aside, we found the labs to be clean and in good order, the controlled substance drug logs to be complete. The lab personnel we met were informed and all had access to the AUPs on which they are named.

Sincerely,

Susan McRae, PhD
IACUC Chair

Appendix 10: IACUC/OB Periodic Report

I. Semiannual Program Review and Facility Inspection Report

Date: September 26, 2019
Members in Attendance: [redacted]

Deficiency Category*	✓	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
A		[redacted]	No deficiencies	[redacted]		
A			PI was informed that the bell jar for euthanasia should be not be opaque (peel wax from clear plastic top) Not currently in use		Corrected immediately; lid replacement found in lab	9/25/19
M			Replace cracked glass lid of dessicator used for euthanasia that has tape on it.		Corrected immediately; lid replacement found	9/25/19
A			Decommissioned, PI left institution			
A			PI will be leaving November 29th-No deficiencies			
M			Expired saline left on cart, but not used since expired		Discarded immediately	9/25/19
A			No deficiencies			
A			No animal work in this lab (only in [redacted]			

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M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
✓ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

II. Semiannual Program Review and Facility Inspection Report

Date: September 26, 2019
Members in Attendance: [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	Euthanasia container for isoflurane 'cottonball method' must ensure no contact between animal and soaked cottonball. Please replace 50mL Falcon tube with a dessicator or larger container and use a physical barrier. Use this in the fume hood.	[redacted]	Correct 11/15/19	
A			No deficiencies			
M			Euthanasia container for isoflurane 'cottonball method' must ensure no contact between animal and soaked cottonball. Use this in the fume hood.		Correct 11/15/19	

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M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

East Carolina University

Department of Biology
Thomas Harriot College
of Arts and Sciences
Howell Science Complex
East Carolina University
Greenville, NC 27858-4353

252-328-6710 office
252-328-4178 fax
www.biology.ecu.edu

20 October 2019

Dr. Sue McRae
Chair, Institutional Animal Care and Use Committee
[redacted]
East Carolina University
Greenville, NC 27858

Dear Sue:

IACUC semiannual inspections of [redacted] were conducted on October 14th & 16th, 2019, by a team comprising [redacted] and me. We also examined the controlled substances safe and log for both departments.

We found the labs to be clean and in good order—the majority of which showed no deficiencies. The deficiencies we did observe, all minor, are detailed in the attached OLAW pages.

Respectfully submitted,

[redacted]

East Carolina University is a constituent institution of the University of North Carolina. An equal opportunity university.

Appendix 10: IACUC/OB Periodic Report

I. Semiannual Program Review and Facility Inspection Report

Date: Oct. 14, 2019
Members in Attendance: [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
A		[redacted]	No deficiencies	[redacted]		
A			No deficiencies			
M			Make sure AUPs are accessible to all lab members; do not label controlle substance drawer "Equithesin" (label removed at inspection); Make sure controlled substances storage and accounting is consistent with DEA/DHHS guidelines; recapped needles in sharps container (do not recap; discard current container)		Correct by 11/15/19	
M			Isoflurane badging recommended (contact [redacted]		Immediately	
M			Current preparation of vehicle for injection inconsistent w/approved AUP (submit amendment to AUP#247a to update injection prep); recapped needles in sharps container (do not recap; discard current container); prepping the skin with betadine once (should prep the skin 3x with alternance of saline solution and betadine)		Correct by 11/15/19	
M			Expired vial of ketamine (removed from safe and discarded)			

Appendix 10: IACUC/OB Periodic Report

II. Semiannual Program Review and Facility Inspection Report

Date: October 14 & 16, 2019
Members in Attendance: [redacted]

Deficiency Category*	✓	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	Recapped needles in sharps disposal bin (do not recap; discard current container)	[redacted]	Correct by 11/15/19	
A			Vertebrate research to resume November 2019			
A			No deficiencies			
A			No deficiencies			
M			Vial of Fatal Plus has no expiration date and may be expire discard.		Immediately	

Appendix 10: IACUC/OB Periodic Report

III. Semiannual Program Review and Facility Inspection Report

Date: Oct. 14, 2019
Members in Attendance: [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	No sharpness records in decap log (update log); Buprenex storage/usage not listed in controlled substance log, nor was its usage recorded on yellow procedure cards (update log & see yellow card training on IACUC website)	[redacted]	Correct by 11/15/19	
A			No current vertebrate work			
M			Euthanasia diluted solution contaminated- discard immediately; Drink cups observed in lab (no food/drinks allowed in lab spaces)		Immediately	
M			Make sure AUP accessible to all lab personnel.		Correct by 11/15/19	

Appendix 10: IACUC/OB Periodic Report

To: Susan McRae, Ph.D.

From: [redacted]
IACUC Member

Subject: Laboratory Inspection

Date: October 14, 2019

Dear Dr. McRae,

On Thursday, October 3, [redacted] and I inspected the [redacted] Accompanying us through the facilities was [redacted]

Our inspection team found the facilities to be well maintained and clean. The animals appeared to be in good health and well cared for.

We did not find any major deficiencies, only a few minor deficiencies that can be easily corrected. The attached OLAW report provides the listing of these minor deficiencies.

Respectfully submitted,

[redacted]

Appendix 10: IACUC/OB Periodic Report

I. Semiannual Program Review and Facility Inspection Report

Date: October 3, 2019
Members in Attendance: [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	Expired Food/Expired autoclaved Water	[redacted]	mmediately	
M			Blue pads covering florescent ceiling lights to dim lighting in the room. Pads attached with tape to ceiling. Remove the pads and consult with DCM Facility Manager or Veterinarians for recommendation for alternative methods. Also, behavioral testing equipment was placed directly on the floor. Please consult DCM for acceptable options.		Correct by 11/15/19	
M			Additional containers of chew guard spray. No expiration date on containers. Please discard.		mmediately	
M			Storage – needs general housekeeping. Gauze under sink shows water stains. EnZol-Enzymatic detergent-expired 6/30/19. Metricide 28-sterilizing solution-expired 2/01/19. Contact EH&S to have expired cleaning solutions disposed of properly. Discard all items showing wate damage.		Correct by 11/15/19	
M			General housekeeping and organization needed.		Correct by 11/15/19	

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M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

I. Semiannual Program Review and Facility Inspection Report

Date: October 3, 2019
Members in Attendance: [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
M		[redacted]	[redacted] checking on chew guard solution to determine useful life. No expiration date or lot # on bottle. Please discard.	[redacted]	Immediately	
M			First-aid kit – aspirin and ointment tubes expired. Replace items in kit.		Immediately	
M			Eyewash cover missing. Enter work order with facilities to have covers replaced.		Correct by 11/15/19	

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M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

The Brody School of Medicine
Office of Prospective Health
East Carolina University
188 Warren Life Sciences Building • Greenville, NC 27834
252-744-2070 office • 252-744-2417 fax

Occupational Medicine
Employee Health
Radiation Safety
Infection Control
Biological Safety

October 21, 2019

Susan McRae, PhD
Chair, Institutional Animal Care and Use Committee (IACUC)
East Carolina University
[redacted]
Greenville, NC 27834

Dear Dr. McRae,

On September 30, 2019 [redacted] consisting of [redacted] Our report was guided by the semiannual review and facility inspection checklist provided by Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC).

In general, the facilities were well maintained, with knowledgeable staff, ensure proper care of research animals. Importantly, all deficiencies from the previous inspection had been addressed.

Attached is the Office of Laboratory Animal Welfare (OLAW) report page with the results of our inspection. There were no major deficiencies noted and only a few minor deficiencies.

Overall the team was pleased with the results of this semi-annual inspection. The animal care and research staff are to be commended for the level of care provided.

Respectfully,

[redacted]

Appendix 10: IACUC/OB Periodic Report

I. Semiannual Program Review and Facility Inspection Report

Date: 9/30/19
Members in Attendance: [redacted] **Dr. Dorcas O'Rourke,** [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
A		[redacted]	No deficiencies noted	[redacted]		
A			Not an active lab			
A			No deficiencies noted			
A			No deficiencies noted			
A		[redacted]	No deficiencies noted	[redacted]		

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M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

II. Semiannual Program Review and Facility Inspection Report

Date: 9/30/19
Members in Attendance: [redacted] **Dr. Dorcas O'Rourke,** [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
A		[redacted]	No deficiencies noted	[redacted]		
A			No deficiencies noted			
A			No deficiencies noted			
A			No deficiencies noted			
A			No deficiencies noted	[redacted]		

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

III. Semiannual Program Review and Facility Inspection Report

Date: 9/30/19
Members in Attendance: [redacted] **Dr. Dorcas O'Rourke,** [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
A		[redacted]	No deficiencies noted	[redacted]		
A			No deficiencies noted			
A			No deficiencies noted			
M			Expired meloxicam		Immediately	
A			No deficiencies noted			

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M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

IV. Semiannual Program Review and Facility Inspection Report

Date: 9/30/19
Members in Attendance: [redacted] **Dr. Dorcas O'Rourke,** [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
A		[redacted]	No deficiencies noted	[redacted]		
A			No deficiencies noted			
A			No deficiencies noted			
A			No deficiencies noted			
A			No deficiencies noted			

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 10: IACUC/OB Periodic Report

V. Semiannual Program Review and Facility Inspection Report

Date: 9/30/19
Members in Attendance: [redacted] **Dr. Dorcas O'Rourke,** [redacted]

Deficiency Category*	√	Location	Deficiency and Plan for Correction	Responsible Party	Correction Schedule and Interim Status	Date Complete
A		[redacted]	No deficiencies noted	[redacted]		

* **A** = acceptable
M = minor deficiency
S = significant deficiency (is or may be a threat to animal health or safety)
C = change in program (PHS Policy IV.A.1.a.-i.) (include in semiannual report to IO and in annual report to OLAW)
NA = not applicable
√ Check if repeat deficiency

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility:	[redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

[redacted] is a 100 % outside air, one pass through, building. The building is designed such that each room is served by its own supply VAV and reheat coil. Each room's temperature is controlled by its own thermostat. Each room also has a dedicated return VAV so that each room can be configured to operate at either positive or negative pressure in relation to the adjoining spaces. The HVAC system has ability to control for high humidity but does not have ability to add humidity. Hot water for the reheat coils is generated by steam to hot water heat exchangers located centrally in each mechanical room. All reheat valves are configured to fail in the closed position. Cooling is supplied by large air handling units (AHU) that are centralized in the main mechanical rooms on each floor. The AHUs have Three-stage filtration systems (Fresh Air intake MERV 8, Prefilter MERV 8, and Finial filter 95%). The AHU receives chill water that is produced at the Central Utility Plant (CUP) which is located directly across the street. The CUP also provides the steam used to in the building heat exchangers. All utilities to and from [redacted] are either underground or are contained within an underground utility tunnel and therefore not susceptible to damage from things like storms or vehicular traffic. The CUP maintains N+1 redundancy of all major components of the chilled water hydronic system. All animal rooms are monitored in real time for temperature control utilizing a Building Automation System (BAS). Any deviation above or below the control limits creates an alarm in the BAS. The BAS is monitored 24/7/365 by an operator at the CUP. If an alarm is received,

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

a technician is dispatched to investigate. Staff of each discipline are on call 24/7 and must be available to return to campus within 45 minutes of being dispatched.

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms (excluding rooms housing aquatic species only) and cage washing facilities must be completed* ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution*. Information may be provided in another format, providing all requested data is included.

Room No.	**Specific Use**	**Temperature Set-Point** (define units)	**Electronic / Emergency Monitoring of Temperatures** (Y/N)	**Alert/Alarm Temperature Ranges** (if applicable; define units)	**Humidity Control** (Y/N)	**Relative Pressure**	**Air Exchange Rate** (per hour)	**Date Verified / Measured**
		(settings to be verified)					**(values to be measured)**	
[redacted]	Autoclave	73F	N	N	N	Neg	7.0	9/23/19
[redacted]	Ante Room	73F	N	N	N	Neg	11.3	9/23/19
[redacted]	Procedure Room	73F	Y	70-77F	N	Neg	11.9	11/20/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	27.7	11/20/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	12.5	11/20/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	20.0	11/20/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	9.3	11/20/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	9.2	11/20/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	15.4	9/23/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	19.3	9/23/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	15.6	9/23/19
[redacted]	Ante Room BSL 3	73F	Y	70-77F	N	Neg	11.4	9/23/19
[redacted]	Procedure Room BSL 3	70F	Y	65-75F	N	Neg	17.5	9/23/19
[redacted]	Support Room BSL 3	73F	N	N	N	Neg	24.4	9/23/19
[redacted]	Rodent Housing BSL 3	71F	Y	68-77F	N	Neg	27.5	9/23/19
[redacted]	Ante Room BSL 2	73F	N	N	N	Neg	21.4	9/23/19
[redacted]	Procedure Room BSL 2	73F	Y	70-77F	N	Neg	15.0	9/23/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	15.1	9/23/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	34.6	9/23/19
[redacted]	Cage Storage	73F	N	N	N	Pos	10.8	9/23/19
[redacted]	Cage Storage	73F	N	N	N	Pos	6.3	9/23/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	10.3	9/23/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	10.7	9/23/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	NHP Treatment Room	73F	N	N	N	Neg	11.7	9/27/19
[redacted]	NHP Procedure Room	73F	N	N	N	Neg	16.5	9/27/19
[redacted]	NHP Housing	73F	Y	70-77F	N	Neg	17.7	9/27/19
[redacted]	NHP Housing	73F	Y	70-77F	N	Neg	11.9	9/27/19
[redacted]	NHP Procedure Room	73F	N	N	N	Neg	10.6	9/27/19
[redacted]	Enrichment Storage	73F	Y	N	N	Neg	1.5	8/27/19
[redacted]	NHP Housing	73F	Y	70-77F	N	Neg	10.4	9/23/19
[redacted]	NHP Housing	73F	Y	70-77F	N	Neg	11.9	9/27/19
[redacted]	Diet Kitchen	70F	Y	N	N	Pos	10.4	8/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	10.5	11/20/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	10.5	11/20/19
[redacted]	Procedure Room	73F	Y	N	N	Pos	10.8	8/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	14.3	8/27/19
[redacted]	Cage Storage	73F	Y	N	N	Pos	11.2	8/27/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Pig Housing	73F	Y	70-77F	N	Neg	10.6	8/27/19
[redacted]	Cage Storage	66F	Y	N	N	Neg	9.0	8/27/19
[redacted]	Feed and Bedding Storage	66F	Y	60-69F	N	Neg	8.6	8/27/19
[redacted]	Sample Storage	66F	Y	N	N	Pos	5.9	8/27/19
[redacted]	Animal Receiving Supply Storage	66F	Y	N	N	Pos	9.5	8/27/19
[redacted]	Tank Storage	73F	Y	N	N	Neg	22.5	8/27/19
[redacted]	Loading Dock	73F	Y	N	N	Neg	4.9	8/27/19
[redacted]	Caging Supplies/Storage	66F	Y	N	N	Neg	16.4	8/27/19
[redacted]	Laundry	66F	Y	N	N	Neg	14.0	8/27/19
[redacted]	PPE Storage	66F	Y	N	N	Pos	8.2	8/27/19
[redacted]	Rodent Cold Exposure Procedure Room	42F	N	35-48F	N	NA	NA	8/27/19
[redacted]	Procedure Room	73F	N	N	N	Neg	11.0	8/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	14.6	8/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	24	8/27/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	23	8/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	19.6	8/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	17.6	8/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	22.2	8/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	19.4	8/27/19
[redacted]	Dirty Side of Cage Wash	68F	N	N	N	Neg	18.0	9/27/19
[redacted]	Clean Side of Cage Wash	68F	N	N	N	Pos	4.1	9/27/19
[redacted]	Chemical Storage	73F	N	N	N	Pos	8.0	9/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	19.2	9/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	27.5	9/27/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	21.1	9/27/19
[redacted]	Rodent Housing (cross foster)	73F	Y	70-77F	N	Neg	24.8	9/27/19
[redacted]	Rodent Housing (quarantine)	73F	Y	70-77F	N	Neg	12.0	9/27/19
[redacted]	Ante Room	73F	N	N	N	Neg	24.9	9/27/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Necropsy	68F	Y	N	N	Neg	19.7	9/27/19
[redacted]	Procedure Room	73F	N	N	N	Neg	27	8/26/19
[redacted]	Procedure Room	73F	N	N	N	Neg	30	8/26/19
[redacted]	Procedure Room	73F	N	N	N	Neg	46.8	8/26/19
[redacted]	Diagnostic Lab	73F	Y	N	N	Neg	10.6	8/26/19
[redacted]	Radiology	73F	N	N	N	Pos	13.1	8/26/19
[redacted]	Surgery Instrument Prep	73F	N	N	N	Neg	7.8	8/26/19
[redacted]	Surgery OR	71F	Y	N	N	Pos	16.5	8/26/19
[redacted]	Surgery OR	70F	Y	N	N	Pos	13.7	8/26/19
[redacted]	Surgery Supply Storage	73F	Y	N	N	Pos	4.7	8/26/19
[redacted]	Surgery Recovery	73F	Y	70-77F	N	Neg	16.8	8/26/19
[redacted]	Surgery Recovery	73F	Y	70-77F	N	Pos	11.9	8/26/19
[redacted]	Surgery Treatment/ Prep	73F	Y	70-77F	N	Pos	11.4	8/26/19

[Create additional rows by pressing TAB in the bottom-right box.]

Copy and repeat the Description and Table for each location, including all satellite housing locations.

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility:	[redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The [redacted] animal facility is a 100 % outside air, one pass through, building. The building is designed such that each room is served by its own supply VAV and reheat coil. Each room's temperature is controlled by its own thermostat. Each room also has a dedicated return VAV so that each room can be configured to operate at either positive or negative pressure in relation to the adjoining spaces. The HVAC system has ability to control for high humidity but does not have ability to add humidity. Hot water for the reheat coils is generated by steam to hot water heat exchangers located centrally in the ground level mechanical room. All reheat valves are configured to fail in the closed position. Cooling is supplied by large air handling units (AHU) that are centralized in the main mechanical rooms on the ground floor. The AHUs have two-stage filtration systems , prefilter MERV 8 and the final filter is 95%. The AHU receives chill water that is produced at the Central Utility Plant (CUP) which is located directly across the street. The CUP also provides the steam used to in the building heat exchangers. All utilities to and from the [redacted] building are underground and therefore not susceptible to damage from things like storms or vehicular traffic. The CUP maintains N+1 redundancy of all major components of the chilled water hydronic system. All animal rooms are monitored in real time for temperature control utilizing a Building Automation System (BAS). Any temperature outside the control limits creates an alarm in the BAS. The BAS is monitored 24/7/365 by an operator at the CUP. If an alarm is received, a technician is dispatched to investigate. Staff of each discipline are on call 24/7 and must be available to return to campus within 45 minutes of being dispatched.

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms (excluding rooms housing aquatic species only) and cage washing facilities must be completed* ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution*. Information may be provided in another format, providing all requested data is included.

Room No.	**Specific Use**	**Temperature Set-Point** (define units)	**Electronic / Emergency Monitoring of Temperatures** (Y/N)	**Alert/Alarm Temperature Ranges** (if applicable; define units)	**Humidity Control** (Y/N)	**Relative Pressure**	**Air Exchange Rate** (per hour)	**Date Verified / Measured**
		(settings to be verified)					**(values to be measured)**	
[redacted]	Procedure Room	73F	N	N	N	Neg	16.8	9/11/19
[redacted]	Procedure Room	73F	N	N	N	Pos	29.5	9/11/19
[redacted]	Procedure Room	73F	N	N	N	Pos	17.7	9/11/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	22.2	9/11/19
[redacted]	Diet Kitchen	70F	N	N	N	Pos	16.9	9/11/19
[redacted]	Large Animal Housing	73F	Y	70-77F	N	Pos	19.3	9/11/19
[redacted]	Chemical Storage	73F	N	NA	N	Neg	13.2	9/1/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	20.1	9/11/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	20.6	9/11/19
[redacted]	Procedure Room	73F	Y	N	N	Neg	4.9	9/11/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	22	9/11/19
[redacted]	Ante Room	73F	N	70-77F	N	Neg	37.8	9/13/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Ante Room	73F	N	70-77F	N	Neg	38	8/19/19
[redacted]	Ante Room	73F	N	70-77F	N	Neg	150	8/19/19
[redacted]	Cage Storage	73F	N	70-77F	N	Pos	198	8/29/19
[redacted]	Ante Room	73F	N	70-77F	N	Pos	28	8/29/19
[redacted]	Procedure Room	73F	Y	70-77F	N	Neg	47.2	10/24/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	14.7	10/24/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	21.4	10/24/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	14.0	10/24/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	11.3	10/24/19
[redacted]	Procedure Room	73F	Y	70-77F	N	Neg	45.3	10/24/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	16.1	10/24/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	26.7	10/24/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	22.1	10/24/19
[redacted]	Rodent Housing BSL 2	73F	Y	70-77F	N	Neg	4.6	10/24/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	X Irradiator	73F	N	N	N	Neg	10.8	8/29/19
[redacted]	X Irradiator	73F	N	N	N	Neg	0	8/29/19
[redacted]	Bird Housing	76F	Y	73-80F	N	Neg	10	8/30/19
[redacted]	Procedure Room	73F	N	N	N	Pos	8.7	8/30/19
[redacted]	Bird Housing	76F	Y	73-80F	N	Pos	29.2	8/30/19
[redacted]	Ante Room	73F	N	N	N	Pos	11.1	8/30/19
[redacted]	Equipment storage	73F	N	N	N	Pos	6.2	8/30/19
[redacted]	Surgery Suite	73F	N	N	N	Neg	17.1	8/30/19
[redacted]	Surgery Prep	73F	N	N	N	Pos	25.2	8/30/19
[redacted]	Surgery Suite	73F	N	N	N	Pos	29.5	8/30/19
[redacted]	Bird Housing	76F	Y	73-80F	N	Pos	22.7	8/30/19
[redacted]	Procedure Room	73F	N	N	N	Pos	16.6	8/30/19
[redacted]	Bird Housing	76F	Y	73-80	N	Pos	17.8	8/30/19
[redacted]	Bird Housing	76F	Y	73-80	N	Neg	7.8	8/30/19
[redacted]	Procedure Room	80F	N	N	N	Pos	18.5	8/30/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	15.5	8/30/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	16.4	8/30/19
[redacted]	Rodent Housing	70F	Y	68-74F	N	Pos	22.9	8/30/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	28.7	9/12/19
[redacted]	Fish Housing	80F	Y	77-84F	N	Neg	12.1	9/12/19
[redacted]	Bird Housing	76F	Y	73-80F	N	Neg	27.4	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	21.5	9/12/19
[redacted]	Procedure Room	73F	Y	70-77F	N	Pos	25.1	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	17.1	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	18.9	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	16.6	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	14.5	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	16.6	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	18.4	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	22.8	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	26.9	9/12/19
[redacted]	Procedure Room	73F	Y	70-77F	N	Neg	21.9	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	16.0	9/12/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Procedure Room	73F	N	70-77F	N	Pos	14.0	9/12/19
[redacted]	Procedure Room	73F	Y	70-77F	N	Neg	14.1	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	620	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	870	9/15/19
[redacted]	Feed and Bedding Storage	66F	N	N	N	Pos	40	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	60	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	64	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	60	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	65	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	43	9/15/19
[redacted]	Break Room	66F	N	N	N	Neg	92	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	134	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	122	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	129	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	52	9/15/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	110	9/15/19
[redacted]	Chemical Storage	73F	N	N	N	Neg	435	9/15/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	38	8/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	41	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	46	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	41	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	43	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	65	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	58	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	73	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	69	9/12/19
[redacted]	Rodent Housing	73F	Y	70-77F	N	Neg	91	9/12/19
[redacted]	Necropsy Room	68F	N	N	N	Neg	9	9/12/19
[redacted]	Cage Storage	73F	N	N	N	Pos	5	9/12/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Dirty Side of Washroom	68F	N	N	N	Neg	15	9/12/19
[redacted]	Clean Side of Washroom	68F	N	N	N	Neg	23	9/12/19
[redacted]	Dirty Rodent Housing	73F	Y	70-77F	N	Neg	13	9/12/19
[redacted]	Dirty Rodent Procedure Room	73F	N	70-77F	N	Neg	6	9/13/19
[redacted]	Dirty Rodent Storage	73F	N	70-77F	N	Pos	10.7	9/13/19
[redacted]	Dirty Rodent Facility Entry	73F	N	70-77F	N	Pos	10.1	9/13/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility: [redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The [redacted] animal facility is a 100 % outside air, one pass through, HVAC system. The facility is designed such that each room is served by its own supply VAV and reheat coil. Each room's temperature is controlled by its own thermostat. Each room also has a dedicated return VAV so that each room can be configured to operate at either positive or negative pressure in relation to the adjoining spaces. The HVAC system has ability to control for high humidity and low humidity. Hot water for the reheat coils is generated by steam to hot water heat exchangers located centrally in the ground floor mechanical room. All reheat valves are configured to fail in the closed position. Cooling is supplied by large air handling units (AHU) that are centralized in the main mechanical room located on the top floor. The AHUs have Three-stage filtration systems (Fresh Air intake MERV 8, Prefilter MERV 8, and Finial filter 95%). The AHU receives chill water that is produced at the Central Utility Plant (CUP). The CUP also provides the steam used to in the building heat exchangers. All utilities to and from [redacted] are underground and therefore not susceptible to damage from things like storms or vehicular traffic. The CUP maintains N+1 redundancy of all major components of the chilled water hydronic system. All animal rooms are monitored in real time for temperature control utilizing a Building Automation System (BAS). Any deviation above or below set points creates alarm in the BAS. The BAS is monitored 24/7/365 by an operator at the CUP. If an alarm is received, a technician is dispatched to investigate. Staff of each discipline are on call 24/7 and must be available to return to campus within 45 minutes of being dispatched. Because the HVAC system is not on the EPSS, environmental conditions cannot be maintained in the event there is a loss of power.

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms (excluding rooms housing aquatic species only) and cage washing facilities must be completed* ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution*. Information may be provided in another format, providing all requested data is included.

Room No.	**Specific Use**	**Temperature Set-Point** (define units)	**Electronic / Emergency Monitoring of Temperatures** (Y/N)	**Alert/Alarm Temperature Ranges** (if applicable; define units)	**Humidity Control** (Y/N)	**Relative Pressure**	**Air Exchange Rate** (per hour)	**Date Verified / Measured**
		(settings to be verified)					**(values to be measured)**	
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	11.2	12/2/2019
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	11.1	12/2/2019
[redacted]	Procedure Room	73F	Y	70-77F	N	Pos	16.9	12/2/2019
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	13.5	12/2/2019
[redacted]	Rodent Housing	73F	Y	70-77F	N	Pos	15.6	12/2/2019
[redacted]	Procedure Room	73F	Y	70-77F	N	Pos	90.4	12/2/2019
[redacted]	Corridor	73F	Y	70-77F	N	Neg	21.7	12/2/2019
[redacted]	Cage Storage	73F	Y	70-77F	N	Pos	0.78	9/26/2019
[redacted]	Robotic Surgery	73F	Y	70-77F	N	Pos	8.5	10/8/19
[redacted]	Robotic Surgery	73F	Y	70-77F	N	Pos	9.5	10/8/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility: [redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The [redacted] is 100 % outside air, one pass through, facility. The facility is designed such that each room is served by its own supply VAV and reheat coil. Each room's temperature is controlled by its own thermostat. Each room also has a dedicated return VAV so that each room can be configured to operate at either positive or negative pressure in relation to the adjoining spaces. The HVAC system has ability to control for high or low humidity. Hot water for the reheat coils is generated by natural gas fired condensing water boilers located centrally in the main mechanical room on the top floor. All reheat valves are configured to fail in the closed position. Cooling is supplied by large air handling units (AHU) that are centralized in the main mechanical room on the top floor. The AHUs have Three-stage filtration systems (Fresh Air intake MERV 8, Prefilter MERV 8, and Finial filter 95%). The AHU receives chill water that is produced at the Central Utility Plant (CUP). All utilities to and from [redacted] are either underground or contained within an underground utility tunnel and therefore not susceptible to damage from things like storms or vehicular traffic. The CUP maintains N+1 redundancy of all major components of the chilled water hydronic system. All animal rooms are monitored in real time for temperature control utilizing a Building Automation System (BAS). Any deviation above or below set points creates alarm in the BAS. The BAS is monitored 24/7/365 by an operator at the CUP. If an

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

alarm is received, a technician is dispatched to investigate. Staff of each discipline are on call 24/7 and must be available to return to campus within 45 minutes of being dispatched.

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms (excluding rooms housing aquatic species only) and cage washing facilities must be completed* ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution*. Information may be provided in another format, providing all requested data is included.

Room No.	**Specific Use**	**Temperature Set-Point** (define units)	**Electronic / Emergency Monitoring of Temperatures** (Y/N)	**Alert/Alarm Temperature Ranges** (if applicable; define units)	**Humidity Control** (Y/N)	**Relative Pressure**	**Air Exchange Rate** (per hour)	**Date Verified / Measured**
		(settings to be verified)					**(values to be measured)**	
[redacted]	Procedure Room	Under Const	Y	NA	N	NA	NA	NA
[redacted]	Procedure Room	Under Const	Y	NA	N	NA	NA	NA
[redacted]	Procedure Room		Y		N			

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility: [redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc*.)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The [redacted] is a 100 % outside air, one pass through, facility. The facility is designed such that each room is served by a separate supply and exhaust with its own CAV box and hot water reheat coil. Each room's temperature is controlled by its own thermostat. Each room can be configured to operate at either positive or negative pressure in relation to the adjoining spaces. The HVAC system has ability to control for high humidity but not low humidity. Hot water for the reheat coils is generated by steam heat exchanger located centrally in the main mechanical. All reheat valves are configured to fail in the closed position. Cooling is supplied by a single large air handling unit (AHU) that is located on the roof. The AHU has a two-stage filtration system with pre and finial filters, both being MERV 8. The AHU receives chill water that is produced by the on-site, air cooled, chiller. All animal rooms are monitored in real time for temperature control utilizing a Building Automation System (BAS). There are redundant mini-split units in the procedure rooms. Any temperatures outside of the control limits creates an alarm in the BAS. The BAS is monitored 24/7/365 by an operator at the [redacted]. If an alarm is received, a technician is dispatched to investigate. Staff of each discipline are on call 24/7 and must be available to return to campus within 45 minutes

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

of being dispatched. Because the HVAC system is not on the EPSS, environmental conditions cannot be maintained in the event there is a loss of power.

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms (excluding rooms housing aquatic species only) and cage washing facilities must be completed* ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution*. Information may be provided in another format, providing all requested data is included.

Room No.	**Specific Use**	**Temperature Set-Point** (define units)	**Electronic / Emergency Monitoring of Temperatures** (Y/N)	**Alert/Alarm Temperature Ranges** (if applicable; define units)	**Humidity Control** (Y/N)	**Relative Pressure**	**Air Exchange Rate** (per hour)	**Date Verified / Measured**
		(settings to be verified)					**(values to be measured)**	
[redacted]	Procedure Room (1)	73F	N	NA	N	Pos	15	9/18/19
[redacted]	Procedure Room (2)	73F	Y	71-75F	N	Pos	14	9/18/19
[redacted]	Procedure Room (6)	73F	N	NA	N	Pos	15	9/18/19
[redacted]	Procedure Room (5)	73F	N	NA	N	Pos	7	9/18/19
[redacted]	Rodent Housing (3)	73F	Y	71-75F	N	Pos	8.5	9/18/19
[redacted]	Procedure Room (7)	73F	N	NA	N	Pos	4.5	9/18/19
[redacted]	Procedure Room (4)	73F	Y	71-75F	N	Pos	7	9/18/19
[redacted]	Storage (11)	73F	N	NA	N	Neg	15	9/18/19
[redacted]	Office (12)	73F	N	NA	N	Pos	18	9/18/19
[redacted]	Procedure Rm (15)	73F	N	NA	N	Neg	5	9/18/19
[redacted]	Cage Storage (13)	73F	N	NA	N	Pos	14	9/18/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility: [redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The [redacted] is a 100 % outside air, one pass through, facility. The facility is designed such that each room is served by a separate supply and exhaust with its own CAV box and hot water reheat coil. Each room's temperature is controlled by its own pneumatic thermostat. The HVAC system has no ability to control for humidity, this is done manually utilizing portable units operated by the PIs. Heat and cooling is supplied by a large package unit (PACU) located at ground level. The AHU has a two-stage filtration system with pre and finial filters. Prefilters are MERV 8 and the final filter is MERV 13. The AHU receives chill water that is produced at the central chiller plant number one (CCP#1) located at the [redacted] Hot water for the room reheat coils is generated by steam heat exchanger located centrally in the main mechanical room located in the basement. All reheat valves are configured to fail in the closed position. A few rooms have window units for redundancy. The temperatures in the animal rooms are not monitored. The AHU is monitored in real time for temperature control utilizing a Building Automation System (BAS). Any temperatures outside the control limits creates an alarm in the BAS. The BAS is monitored 24/7/365 by an operator at the [redacted]. If an alarm is received, a technician is dispatched to investigate. Staff of each discipline are on call 24/7 and must be available to return to campus within 45 minutes of being dispatched. Because the HVAC system is not on the EPSS, environmental conditions cannot be maintained in the event there is a loss of power.

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms (excluding rooms housing aquatic species only) and cage washing facilities must be completed* ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution*. Information may be provided in another format, providing all requested data is included.

Room No.	**Specific Use**	**Temperature Set-Point** (define units)	**Electronic / Emergency Monitoring of Temperatures** (Y/N)	**Alert/Alarm Temperature Ranges** (if applicable; define units)	**Humidity Control** (Y/N)	**Relative Pressure**	**Air Exchange Rate** (per hour)	**Date Verified / Measured**
		(settings to be verified)					**(values to be measured)**	
[redacted]	Fish Housing	68F	N	NA	N	Pos	12	9/10/19
[redacted]	Fish Housing	80F	N	NA	N	Pos	7.7	9/10/19
[redacted]	Procedure Room		N	NA	N			
[redacted]	Fish and Frog Housing	78F	N	NA	N	Neu	5.7	9/10/19
[redacted]	Frog Housing	73F	N	NA	N	Pos	5.2	9/10/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility: [redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The [redacted] is a 100 % outside air, one pass through, facility. The facility is designed such that each room is served by a separate supply and exhaust with its own CAV box and hot water reheat coil. Each room's temperature is controlled by its own pneumatic thermostat. The HVAC system has no ability to control for humidity, this is done manually utilizing portable units operated by the PIs. Heat and cooling is supplied by two large package units (PACU) located on the roof. The AHU has a two-stage filtration system with pre and finial filters. Prefilters are MERV 8 and the final filter is MERV 13. The AHU receives chill water that is produced at the central chiller plant number one (CCP#1) located at the Science and Technology building. Hot water for the room reheat coils is generated by steam heat exchanger located centrally in the main mechanical room. The temperatures in the animal rooms are not monitored centrally. Research staff monitor room temperatures. The AHU is monitored in real time for temperature control utilizing a Building Automation System (BAS). Any temperatures outside the control limits creates an alarm in the BAS. The BAS is monitored 24/7/365 by an operator at the [redacted]. If an alarm is received, a technician is dispatched to investigate. Staff of each discipline are on call 24/7 and must be available to return to campus within 45 minutes of being dispatched. Because the HVAC system is not on the EPSS, environmental conditions cannot be maintained in the event there is a loss of power.

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms*

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

(excluding rooms housing aquatic species only) and cage washing facilities must be completed ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution*. Information may be provided in another format, providing all requested data is included.

Room No.	**Specific Use**	**Temperature Set-Point** (define units)	**Electronic / Emergency Monitoring of Temperatures** (Y/N)	**Alert/Alarm Temperature Ranges** (if applicable; define units)	**Humidity Control** (Y/N)	**Relative Pressure**	**Air Exchange Rate** (per hour)	**Date Verified / Measured**
		(settings to be verified)					**(values to be measured)**	
[redacted]	Fish Housing	25C	N	NA	N	Neg	4.5	9/10/19
[redacted]	Fish Housing	58F	Y	55-61F	N	Neg	NA	9/10/19
[redacted]	Larval Fish Housing Incubator	28.5C	Y	26-29C	N	Pos	1.8	9/10/19

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility:	[redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc*.)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The [redacted] is used for seasonal outdoor cattle tank mesocosm housing of amphibians and fish.

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility:	[redacted]

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The [redacted] Aviary is located within the [redacted]. The aviary is an outdoor flight space with access to shelter. In winter months, a heater is used to keep the shelter temperature appropriate for the species. Plastic panels are also put in place to protect from drafts and extreme temperatures during winter months.

Appendix 12: Aquatic Systems Summary – Part I

Please summarize water management and monitoring information programs for each animal facility, including all satellite facilities, rooms, enclosures. The following key will assist you in completing the form:

(1) List location of aquaria, including outdoor enclosures (ponds or outdoor tanks). If indoors, list building and room number. Note that all species housed at the same location and maintained via the same design and monitoring may be listed in the same row.
(2) Please indicate if embryonic (E), larval (L), juvenile (J) or Adult (A)
(3) Group tanks (ponds, outdoor tanks, multiple aquaria) are arranged as arrays with shared water supply; individual aquaria have exclusive water handling systems.
(4) Indicate water type, e.g., fresh, brackish, or marine.
(5) Indicate water pre-treatment, e.g., dechlorination, rough filters.
(6) Indicate water circulation, e.g., static, re-circulated, constant flow, or some combination of these. If applicable, indicate water exchange frequency and amount (percentage).
(7) Provide a key word for filtration employed, e.g., biological, chemical, mechanical, and type (e.g., mechanical-bead filter). A diagram may be provided showing the flow of water, filtration, source of "make-up" water and amount replaced daily.

Part I

Location (1)	Species (2)	System Design					
		Group / Individual (3)	Water Type (4)	Pre-treatment (5)	Circulation (6)	Filtration (7)	Disinfection (e.g., UV, ozone)
[redacted]	Zebrafish E,L, J, A	Grouped Individual	Fresh	Reverse Osmosis	Re-circulated and exchanged 10% of H2O capacity, daily	Mechanical: Cellulose Polyester Filter Cartridge, stainless steel mesh	UV sterilization
[redacted]	Stickleback (E, L, A)	Individual	Fresh (with low salt)	Dechlorination, filters	Re-circulated	Mechanical, biological filter with floss, sponge	N/A

Appendix 12: Aquatic Systems Summary – Part I

Location (1)	Species (2)	System Design					
		Group / Individual (3)	Water Type (4)	Pre-treatment (5)	Circulation (6)	Filtration (7)	Disinfection (e.g., UV, ozone)
[redacted]	Naked goby A	Individual	Marine	Dechlorination	Static w/ air supply provided by air stones; tanks monitored for evaporation and fresh water replenished as needed, usually every week	None	N/A
[redacted]	Zebrafish (E, L)	Individual	Fresh	Dechlorinated	Static	None	None
[redacted]	Zebrafish	Group	Fresh	Reverse osmosis	Recirculated	Biological, mechanical, carbon	UV
[redacted]	Amphibians, fish	Individual	Fresh	Dechlorinated	Static	None	None

Note: Records of equipment maintenance (filter changes, UV bulb changes, probe changes, calibrations, *etc.*) should be available for review.

[Create additional rows by pressing TAB in the bottom-right box.]

Appendix 12: Aquatic Systems Summary – Part II

The following key will assist you in completing this form:

(1) In these columns, please indicate monitoring frequency, e.g. daily, weekly, monthly or other point sampling frequency; continuous/real time, or none, if applicable. Also indicate method of control (heaters versus room HVAC, hand versus auto dosing, etc.).

(2) Indicate other parameters and their monitoring frequency, e.g., alkalinity, total hardness, conductivity, chlorine/chloramine.

Part II

Monitoring ***Indicate in the boxes below the frequency of monitoring and method of control for the following parameters. (1)***									
Location (from Part I)	**Temperature**	**Salinity**	**pH**	**NH_4**	**NO_2**	**NO_3**	**Dissolved O_2**	**Total Dissolved Gases**	**Other. Please List (2):**
[redacted]	C	C	C	Weekly	Weekly	Weekly			
[redacted]	C	C	C	Weekly	Weekly	Weekly			
[redacted]	Bi-Weekly	Bi-Weekly	Bi-Weekly	Bi-Weekly	Bi-Weekly	Bi-Weekly	n/a	n/a	
[redacted]	Temperature sensor checked daily	Checked weekly and replenished with fresh water as needed	N/A	N/A	N/A	N/A	Continuously bubbled in from airstones checked daily	N/A	

Note: This information may be provided in another format, provided that all requested data is included.

[Create additional rows by pressing TAB in the bottom-right box.]

Appendix 13: Primary Enclosures and Animal Space Provisions

Please complete the Table below considering performance criteria and guiding documents (e.g., Guide, Ag Guide, ETS 123 and/or other applicable standards) used by the IACUC/OB to establish adequacy of space provided for all research animals including traditional laboratory species, agricultural animals, aquatic species, and wildlife when reviewing biomedical, field, and agricultural research studies.

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Mouse	17"x9"x6" (Lg. Mouse) 10.5"x6.5"x5" (Sm. Mouse) 12"x6.25"x5.75" (Super Mouse 750 cage) 12"x12"x7" (Tecniplast) 12"x6.6"x5" ([redacted] IVC) 13.5"x11.5"x6.1" (Optimouse IVC) 11.5"X7"x5" (Innovive IVC)	10 (large cage) 5 (small cage) 5 under (20g)	*Guide*	Static microisolator cages and IVCS: high temp polycarbonate (PC), ultra-high temp PC, polypropylene SuperMouse, low profile ultra high temp Techniplast; special polycarbonate cages with wire bottoms for tick feeding

Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Rat	Plastics are all 17.5"x8.75"x8" or 20"x16"x8" SS size 10"x7"x7" 15.3"x22.4"x10.3" (Optirat IVC)	5 (under 200g) 1 (SS cages)	*Guide*	Static microisolator cages and [redacted] IVCS. High temp polycarbonate (PC); ultra-high temp PC, polypropylene
Stickleback	10, 27, and 50 gallon aquaria	5, 20, 20 fish per tank	*Guide* and performance standards	Glass
Zebrafish	.5L, 1.4L, 3L, 6L, and 10L tanks for [redacted] utomated systems	10 adults per liter	*Guide*, IACUC approved exception (Castranova et al, 2011)	Acrylic
Zebrafish	7 x 3 x 3.5 inches (0.5 L)	50 larvae	*Guide*, IACUC approved exception (Castranova et al, 2011)	Individual stand-alone tanks, manual water change, used for raising larvae until transferred to aquatic systems enclosures.
Poison Dart Frog	5-10 gallon aquaria	5	AAALAC Reference Resources, performance standards	Glass and plastic Multiple substrate layers with plants, hides and pools

Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Finches	84"x48"x72" 84"x96"x72" 27"x24"x18" 17"x13"10.5" 17.5"x13.5"x15"	50 in each Aviary 12 in medium cages	AAALAC Reference Resources, performance standards	There are multiple cages: aviaries, small cages
Fish, tadpoles, salamanders	100-300 gallon stock tanks	1-4 fish per 25 gallons 4 tadpoles per gallon 1 salamander per 35 gallons	AAALAC Reference Resources, study design dictates number of animals per enclosure	Heavy duty plastic
Naked goby (Gobiosoma bosc)	(approx.) 16 x 6 x 10 inches	10 fish	None	Enclosure is a plastic "critter keeper" aquarium tank filled with sea water (at a salinity matching where the fish were collected) and lined with clean oyster shell to serve as refuge space

Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Pig	8'x16'x4'	12 (<50)	*Guide*	Run: Galvanized chain link construction. Flooring is epoxy-quartz monolithic.
Rhesus Macaques	54"x26"x66" 68"x30"x64" 69"x26.5"x69" 70"x27"x79" 61"x60"x96"	3 adults (68x30x64) 7 juveniles (70x27x79) 4 juveniles (54x26x66)	*Guide*	[redacted] SS primate cages. [redacted] SS Primate cage. [redacted] SS Play cage.

*For aquatic species, provide tank volume.
**Include descriptors such as open-topped, static microisolator, individually-ventilated cage systems (IVCS).

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Please describe the cleaning and disinfection methods in the Table below. Note the washing/sanitizing frequency and method for each of the following:

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Micro-environment				
Solid-bottom cages (static)	Cage washer	1-2 times per week	Clout	
Solid-bottom cages (IVC)	Cage washer	Biweekly	Clout	
Suspended wire-bottom or slotted floor cages	Cage washer	Biweekly	Clout, Uri-Solv	
Cage lids	Cage washer	Biweekly	Clout	
Filter tops	Cage washer	Biweekly	Clout	
Cage racks and shelves	Cage washer	Biweekly	Clout	
Cage pans under suspended cages	Cage washer	1-3 times per week	Clout, Uri-Solv	
Play pens, floor pens, stalls, etc.	Cage washer or power wash	Biweekly	Clout, Uri-Solv, Quatricide	
Corrals for primates or outdoor paddocks for livestock	N/A	N/A		

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Aquatic, amphibian, and reptile tanks and enclosures	Hand washing – Zebrafish	Daily for holding tubs, bi weekly for housing tanks	None	Bleach
	Sides of tanks are cleaned with a sponge and paper towels – Dart Frogs	Once per month	None	
	Hand washing – Goby Tanks	After being used to house gobioid fishes (approx. 4 weeks)	Detergent	
	Hand Washing – Stickleback		Bleach	Bleach tank in between uses

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
		Once fish are moved; as needed		
Feeders	Cage washer	Biweekly	Clout	
Watering devices	Cage washer	1-2 times per week	Clout	
Exercise devices and manipulanda used in environmental enrichment programs, etc.	Cage washer	After each use	Clout	
Transport cages	Cage washer	After each use	Clout	
Operant conditioning & recording chambers, mechanical restraint devices (chairs, slings, etc.)	Hand washed	After each use	Quatricide	
Euthanasia chambers	Hand washed	After each use	Clidox	
Macro-Environment				
Animal Housing Rooms:				

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Floors	Mop	1 per week	Quatricide	
	Hand washing – Stickleback	Biweekly/as needed	Water, Lab soap/disinfectant	
	Hand Washing – Howell Zebra fish	Daily sweeping, monthly mopping, quarterly scrub		
	Swept, mopped- Dart frogs	1x week	Non-toxic cleaner	Cleaned with a mop and wet vac
Walls	Power wash or garden sprayer	Monthly	Quatricide	
	Hand washing – Stickleback	Yearly and as needed	Water	Cleaned by hand yearly or as needed
	Wiped down – Dart frogs	1x year	Non-toxic cleaner	

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Ceilings	Power wash or garden sprayer	Monthly	Quatricide	
Ducts/Pipes	Filters	Checked daily		
Fixtures	N/A	N/A	N/A	
Corridors:				
Floors	Mop	1 per week	Quatricide	
Walls	Hand mopped	Annually	Quatricide	
Ceilings	Hand mopped	Annually	Quatricide	
Ducts/Pipes	N/A	N/A		
Fixtures	N/A	N/A		
Support Areas (e.g., surgery, procedure rooms, etc.); complete for each area:				

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Floors	Mop	1 per week, and after each procedure for surgery	Quatricide	
Walls	Hand wiped	Monthly	Quatricide	
Ceilings	Hand wiped	Monthly	Quatricide	
Ducts/Pipes	N/A	N/A		
Fixtures	Hand wiped	1 per week and after each use	Quatricide	
Implements (note whether or not shared):				
Mops	Laundered in house	Weekly	Chlorinated Bleach	Mops room specific

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Mop buckets	Cage Wash	After each use	Clout	Not Shared
Aquaria nets	Soak and hand wash – Zebra fish Hand washed – DCM Net Soak – Stickleback	Daily After each use Daily	Diluted bleach Benzalkonium Chloride Benzalkonium Chloride	Not shared
Other	n/a	n/a	n/a	
Other:				
Vehicle(s)	Small vans hand sanitized, box truck hosed and mopped	After each use	Quatricide	
Other transport equipment (list)	[redacted] Transport Carts – Cage wash	After each use	Clout	

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

*Please provide chemical, not trade name.

Appendix 15: Facilities and Equipment for Sanitizing Materials

In the Tables below, summarize the facilities and equipment used to sanitize animal related equipment (tunnel washer, bottle washer, rack washer, bulk autoclave, hand-washing area, bedding dispensing unit, *etc.*). Note that some descriptions may be combined if all share identical features (e.g., all rack washers).

[*Note*: Please remove the examples provided in the Table below.]

Building	Room No.	Equipment Type	Safety Feature(s)	Methods of Monitoring Effectiveness
[redacted]	[redacted]	Rack washer (4 units)	De-energizing pull cords, explosion release door latches, instructional signage inside and outside of each washer.	Temperature tapes daily, quarterly maintenance by outside contractors, cultures quarterly.
[redacted]	[redacted]	Bedding dispensing unit	Manual shut off, safety bars to limit access to moving parts inside the unit	Filters cleaned at least 3 times a week. Quarterly maintenance by outside contractors
[redacted]	[redacted]	Bedding disposal unit	Manual shut off, HEPA filter to limit staff exposure to allergens	Filters changed weekly, more often if needed. Annual certification
[redacted]	[redacted]	Autoclaves (not bulk) (4 units)	Abort buttons either side of autoclaves.	Quarterly testing with biological indicators, steri strips each load. Quarterly maintenance by outside contractors.

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Appendix 16: Lighting Summary

Using the Table below, summarize the lighting system(s) for the animal housing facility(ies). For each species or holding room type, list light intensity (range), construction features (e.g., water resistance), photoperiod (light:dark) and control (e.g., automatic versus manual, phasing). For systems automatically controlling photoperiod, describe override mechanisms (including alarms, if applicable).

Location: [redacted]

Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features**[b]	**Photo-period** (hrs)[c]	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)
Dog Holding Room	14-29fc	Recessed, water resistant	12:12	Automatic via building management system	Mechanical timer set at 30 minutes
Bird Holding Rooms	15-36fc	Surface mounted, and recessed, water resistant	12:12	Automatic via building management system and via wall-mounted timer boxes	Mechanical timer set at 30 minutes and Mechanical on/off switch
Primate Holding Rooms	19-31fc	Recessed, water resistant	12:12	Automatic via building management system	Mechanical timer set at 30 minutes
Rodent Holding Rooms	14-42fc	Recessed and surface mounted, water resistant	10:14 (Barrier) 12:12 (All other)	Automatic via building management system and via wall-mounted timer boxes	Mechanical timer set at 30 minutes and Mechanical on/off switch
Pig Holding Room	36fc	Recessed, water resistant	12:12	Automatic via building management system	Mechanical timer set at 30 minutes
Surgery	40-70fc	Surface mounted, water resistant	NA	N/A	N/A
Procedure Rooms	40fc	Surface mounted, water resistant	NA	N/A	N/A
Necropsy	Not measured	Surface mounted, water resistant	NA	N/A	N/A
Cage Wash Rooms	Not measured	Surface mounted, water resistant	NA	N/A	N/A

Appendix 16: Lighting Summary

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
Bird Holding Rooms	25-44fc	Surface mounted, water resistant	14:10 12:12	Automatic via wall-mounted timer boxes	Mechanical on/off switch
Fish Holding Room	27fc	Surface mounted, water resistant	12:12	Automatic via wall-mounted timer boxes	Mechanical on/off switch
Rodent Holding Rooms	23-35fc	Recessed and surface mounted, water resistant	12:12	Automatic via wall-mounted timer boxes	Mechanical on/off switch
Surgery	55-69fc	Surface mounted, water resistant	NA	N/A	N/A
Procedure Rooms	40-53fc	Surface mounted, water resistant	NA	N/A	N/A
Necropsy	Not measured	Surface mounted, water resistant	NA	N/A	N/A
Cage Wash Rooms	Not measured	Surface mounted, water resistant	NA	N/A	N/A

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
Rodent Holding Rooms	33-38fc	Recessed and surface mounted, water resistant	12:12	Automatic via wall-mounted timer boxes	Mechanical on/off switch
Procedure Rooms	43-50fc	Surface mounted, water resistant	NA	N/A	N/A
Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features[b]**	**Photo-period (hrs)[c]**	**Photoperiod and Lighting Control**	**Override Mechanisms (if applicable)**
Rodent Holding Rooms	32-40fc	Recessed and surface mounted, water resistant	12:12	Automatic via wall-mounted timer boxes	Mechanical on/off switch

Appendix 16: Lighting Summary

Location: [redacted]

Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features**[b]	**Photo-period** (hrs)[c]	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)
Procedure Rooms	45-50fc	Surface mounted, water resistant	NA	N/A	N/A

Location: [redacted]

Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features**[b]	**Photo-period** (hrs)[c]	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)
Fish Holding Rooms	30-64fc	Recessed and surface mounted, water resistant	14:10	Automatic	Mechanical on/off switch
Frog Holding Rooms	31-65fc	Surface mounted, water resistant	12:12	Automatic	Mechanical on/off switch

[a] A list of each room is not needed; group or cluster rooms by species or function
[b] Include such features as water resistance, red lighting, *etc*.
[c] Note if light cycle inverted/reversed

Repeat Location and Table as necessary for each location, including satellite housing locations.

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Appendix 17: [redacted]

Note: In the Program Description Section 2. IV. (Physical Plant), item C., describe the criteria used to determine a "Satellite Animal Holding Area." In the Table below, summarize these animal housing areas. Note that the total square footage for all each of these must also be included in the Summary of Animal Housing and Support Sites **(Appendix 2)**, and applicable information regarding these areas included in the Heating, Ventilation, and Air Conditioning (HVAC) Summary (**Appendix 11**) and Lighting Systems Summary (**Appendix 16**).

Building	Room(s)	Person Responsible	Species Used	Approximate Area (ft^2 or m^2) Devoted to Housing	Maximum Period of Stay	Purpose / Rationale / Justification	Construction Features and Finishes
[redacted]	[redacted]	[redacted]	Zebrafish	885 ft^2	Permanent animal facility	[redacted]	The facility has two separate rooms, with individual light switch controllers, which are completely sealed from the outside and each other. The photoperiod of the rooms is digitally controlled. The facility is equipped with four computer controlled 6-shelf double sided standalone zebrafish housing systems from [redacted] with automatic water quality monitoring and control.
[redacted]	[redacted]	[redacted]	Stickleback	350 sq ft	Permanent	[redacted]	Large environmental refrigerated chamber, interior recently renovated and repainted; sealed floor

Appendix 17: [redacted]

Building	Room(s)	Person Responsible	Species Used	Approximate Area (ft^2 or m^2) Devoted to Housing	Maximum Period of Stay	Purpose / Rationale / Justification	Construction Features and Finishes
[redacted]	[redacted]	[redacted]	Naked goby	300 ft^2	permanent	[redacted]	Epoxy painted CMU walls, honeycomb concrete ceiling and quarry tile floors. Doors are sealed wood. Windows are painted over.
[redacted]	[redacted]	[redacted]	killifish	300 ft^2	permanent		Epoxy painted CMU walls, honeycomb concrete ceiling and quarry tile floors. Doors are sealed wood. Windows are painted over.
[redacted]	[redacted]	[redacted]	frogs, fish	300 ft^2	permanent		Epoxy painted CMU walls, honeycomb concrete ceiling and quarry tile floors. Doors are sealed wood. Windows are painted over.
[redacted]	[redacted]	[redacted]	fish, tadpoles	200 ft^2	permanent		Epoxy painted CMU walls, honeycomb concrete ceiling and quarry tile floors. Doors are sealed wood. Windows are painted over.

Appendix 17: [redacted]

Building	Room(s)	Person Responsible	Species Used	Approximate Area (ft^2 or m^2) Devoted to Housing	Maximum Period of Stay	Purpose / Rationale / Justification	Construction Features and Finishes
[redacted]	[redacted]	[redacted]	poison dart frogs	200 ft^2	permanent	[redacted]	Epoxy painted CMU walls, honeycomb concrete ceiling and quarry tile floors. Doors are sealed wood. Windows are painted over.
[redacted]	[redacted]	[redacted]	zebrafish embryos and larvae	incubator	10 days	Incubators located in lab	Painted CMU walls, honeycomb concrete ceiling and sealed wood doors. Floors are vinyl tile.
[redacted]	[redacted]	[redacted]	frogs	0.25 acres	seasonal	Mesocosms imitate natural ponds	Rubbermaid cattle tanks
[redacted]	[redacted]	[redacted]	finches	1100 ft^2	permanent	Dual function research and education aviaries	Wood and wire with concrete base for predator exclusion and pea gravel substrate; wooden shelter for weather extremes

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