IBRL
INTEGRATED BIOPROCESSING RESEARCH LABORATORY

Operations Manual & Use Policy

February 24, 2019

(Rev. 5)

Vijay Singh, PhD **Phone: (217) 333-9510** **Email: vsingh@illinois.edu**
Director & Distinguished Professor of Bioprocessing

Brian Jacobson **Phone: (217) 300-5404** **Email: bjacobs3@illinois.edu**
Assistant Director of Food & Bioprocessing Pilot Plant Operations

Beth Conerty, PhD **Phone: (217) 300-4543** **Email: bconerty@illinois.edu**
Business Development Manager

Eric Wolfe **Phone: (217) 300-7519** **Email: ewolfe@illinois.edu**
Pilot Plant Specialist

Phillip Manning **Phone: (217) 300-1120** **Email: manningp@illinois.edu**
Pilot Plant Specialist

James Johnson **Phone: (217) 300-7080** **Email: jamesfj@illinois.edu**
Office Specialist

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Full floor plan details available at end of this document

Available Utilities:

1. High Pressure Steam – 100 PSI (Pilot Plant & Volatile Extraction Room)
2. Clean Steam – 80PSI (Pilot Plant & Volatile Extraction Room)
3. Process Chill Water – Campus Loop (Pilot Plant & Volatile Extraction Room)
4. Potable Cold Water (Pilot Plant, Volatile Extraction Room, & Analytical Laboratory)
5. Compressed Air – 90PSI (Pilot Plant, Volatile Extraction Room, & Analytical Laboratory)
6. Other Compressed Gases (Pilot Plant, Volatile Extraction Room, & Analytical Laboratory)
7. Natural Gas (Pilot Plant, Volatile Extraction Room, & Analytical Laboratory)
8. Distilled Water (Pilot Plant, Volatile Extraction Room, & Analytical Laboratory)
9. 3ph 208V/460V power (Pilot Plant, Volatile Extraction Room, Grinding Room & Analytical Laboratory)
10. 1ph 110V/208V power (Pilot Plant, Volatile Extraction Room, Grinding Room & Analytical Laboratory)

Available Equipment:

Equipment available in the IBRL and associated spaces varies widely and changes quickly. An updated list is maintained on the IBRL website or is available via inquiry to IBRL Management.

1. Goals

a. To create a professional and safe environment in which teaching, research, and extension activities can be conducted in support of the mission of the Integrated Bioprocessing Research Laboratory (IBRL). All activities in the IBRL must generate sufficient economic returns to cover the cost of the activity.

The Integrated Bioprocessing Research Laboratory (IBRL) mission is to advance research and education focused on bioprocessing platforms in renewable fuel, fiber, and food and to stimulate bio-economic development in the State of Illinois. The IBRL will provide the critical resources required to scale-up research technologies smoothing the path to commercialization. The near term strategic objective is to engage with industry to promote a unique collaboration between industrial needs and the academic resources available at the University of Illinois.

b. The priorities of the Pilot Plant are as follows:
    i. Industry Projects
        1. To provide facilities and staff support on a fee schedule to assist companies and individuals with production and testing of their products.
    ii. Research & Extension
        1. To provide a state-of-the-art facility and technical assistance for conducting processing research at the pilot scale.
        2. To assist in the transfer of new technology/processes from research to industry.
        3. To provide facilities for use in applied extension research and continuing education programs/short courses.
    iii. Education & Workforce Development
        1. To provide a hands-on learning experience for students enrolled in the traditional Department of Agricultural and Biological Engineering degree programs, Bioprocessing and Bioenergy Professional Science Master's program, and other related programs in the College of ACES.

2. Authorized Personnel

a. Every person that works in the facility needs to have a completed and signed ***IBRL Safety Orientation Checklist*** turned into IBRL Management. Only individuals with this training will be authorized to work in the IBRL. IBRL management (or designee) must provide this training. More details below in **Section 5: Safety**.

b. Visitors are only allowed in the processing spaces of IBRL when accompanies by IBRL staff. For liability reasons, persons that are not students, staff, individuals holding contracts for facility use, members of an approved RSO or community organization, or officially enrolled in an extension short course are not allowed to work in the IBRL. Visitors touring or observing a process must be kept a safe distance away from hazardous equipment that is in operation.

c. Tour groups not affiliated with IBRL should be directed to IBRL Management. Due to the sensitive nature of the work of IBRL, it is unlikely these tours will be able to be accommodated. Children under the age of 12 are not allowed in the IBRL facilities.

3. Scheduling & Activity Prioritization

a. Use of the IBRL is limited to projects that further its mission and must be approved by IBRL Management. All potential projects must include a budget and anticipated schedule. IBRL Management reserves the right to deny access to any project or individual and has final determination in project priority.
b. Scheduling of the IBRL facility is best handled through email to the ***Assistant Director of Food & Bioprocessing Pilot Plant Operations***. **NO** activities are to take place in the IBRL without prior permission from IBRL Management.
c. IBRL staff will assist in connecting potential projects to relevant faculty expertise. Scheduling of the IBRL facility is for equipment use and facilities support ONLY. Faculty support is often available, but will require coordination and agreement between IBRL staff, project members, and faculty.
d. All projects must be compatible with other activities in the facility and be within the scope of existing IBRL equipment and staff capabilities; or the project must account for leased, rented, or project-owned equipment approved by IBRL Management.
e. Scheduling Priority
    i. Industry Projects
        1. Industry projects are a critical component of the mission of IBRL and assist in industry relations, promote opportunities for students, and provide funds for IBRL operations.
        2. No work will begin until a Technical Testing Agreement (TTA), Research Agreement, or other contract is signed by both parties. The contract will outline dates and times of use as to not interfere with other IBRL activities, as well as a budget for work, IP and liability details, and other items.
    ii. Research & Extension
        1. Research projects by faculty associated with IBRL or affiliated programs in the College of ACES will be considered high priority.
        2. Projects must include a CFOP & budget for materials, maintenance of equipment, and staff wages.
    iii. Education & Workforce Development
        1. Classes associated with Bioenergy or Bioprocessing topics in either the traditional or PSM degree programs will take precedent over all other classroom requests. The IBRL classroom is **NOT** available as a general use classroom.
        2. Requests for other use of the facility must be directed to IBRL Management for consideration. Activities related to Bioenergy and Bioprocessing will be most likely to be approved to use the IBRL facility.
    iv. Other projects as established in consultation with IBRL Management will be considered after the above activities.

4. Fees

a. General
    i. The IBRL operates under a cost recovery model and all projects in the facility must have an approved budget by IBRL Management.
    ii. All activities by non-UIUC faculty, staff, and students in the IBRL will require an executed contract before beginning work.

b. Industry Projects
    i. Industry projects must be approved by the ***Assistant Director of Food & Bioprocessing Pilot Plant Operations*** and hold an executed Technical Testing Agreement (TTA), Research Agreement, or other contract.
    ii. Projects with companies or individuals that will require the specific expertise of a faculty member or the use of processing equipment that is part of a faculty member's laboratory will be required to include an appropriate budget as agreed with the faculty member.
        1. Projects organized by faculty members involving outside industry will require an approved budget by the ***Assistant Director of Food & Bioprocessing Pilot Plant Operations*** before commencing.
c. Research
    i. Research projects held in the IBRL must be approved by the ***Assistant Director of Food & Bioprocessing Pilot Plant Operations***, and include a CFOP & budget for materials, maintenance of equipment, and staff wages.
d. Education & Workforce Development
    i. Educational activities held in the processing spaces, conference rooms, or classrooms of IBRL must be approved by IBRL Management and include cost recovery.
e. Other
    i. Fees for all other activities will be determined on a case by case basis by IBRL Management.

5. Safety & Required Practices

a. General
    i. The IBRL is a safe facility, but there are many risks not found in common laboratories or workspaces. These will be covered in the ***IBRL Safety Orientation Presentation.***
    ii. Failure to follow safety guidelines will result in immediate removal from the IBRL and referral to the IBRL Director.
    iii. Report any injury or safety incident to IBRL Management as soon as possible.
    iv. Any individual entering the IBRL processing spaces must dress in a professional and hygienic manner at all times. Shorts, sandals, or open toed shoes cannot be worn. Full description of required dress code is included in the ***IBRL Safety Orientation Presentation.***
b. Emergencies
    i. In case of serious emergency, immediately dial 911 from the nearest facility phone IBRL 1010-Pilot Plant, IBRL 1053-Workshop, or IBRL 2051-Laboratory.
    ii. First Aid Kit Locations
        1. IBRL 1010 – Located in hallway entrance to facility, near PPE
        2. IBRL 2051 – Located on West wall, center of room
    iii. Safety Shower & Eye Wash Locations
        1. IBRL 1010 – Located on either end of pilot plant
        2. IBRL 2051 – Located on North & South end of analytical lab
    iv. Fire Alarm
        1. Located near exterior doors to building
    v. Fire Extinguishers
        1. Located in various locations throughout facility with signage above

vi. Serious Weather
    1. Gather in basement hallway near ABL stair tower

c. Security & Off-Hours Activities
    i. The IBRL will be open for regular hours from 8:30am-4:30pm Monday through Friday. The IBRL and associated areas will be locked, and if access outside of these hours is necessary, it must be scheduled in advance with IBRL Management.
    ii. Any off-hour activity will require prior approval from IBRL Management, along with the presence of two people who have completed the ***IBRL Safety Orientation Checklist***.
    iii. All doors in the IBRL are locked via monitored card access. The doors are not to be left or propped open in any way. If doors are left open, alarms will sound. Authorized users will be issued a key card that must be returned upon completion of the project.
    iv. Many entrances and spaces in the IBRL are monitored and recorded by a camera system.
d. Intellectual Property (IP)
    i. The IBRL serves many different users, and the protection of IP is of utmost concern. Executed contracts will cover IP topics, but all users must respect privacy while working in the space.
    ii. Access is only granted to those on contract, with a key card. No other individuals are allowed in processing spaces. Many locations in the processing spaces are video recorded.
    iii. You are restricted to working in the areas assigned to you. Any attempt to access unauthorized areas will result in immediate removal from the facility and referral to the IBRL Director for further action. These include all curtained areas in the Pilot Plant.
e. Material Handling & Maintenance Shop Equipment
    i. Only trained personnel are allowed to use the forklift and scissor lift. Training must be completed by Facilities & Services or IBRL Management.
    ii. Only trained operators are allowed to use maintenance shop equipment (mill, metal working equipment, welders, plasma table, band saw, etc.)
f. Processing Equipment & Utilities
    i. Connection of all equipment and allocation of space for equipment is under the direction of IBRL Management. Any unsafe utility connection or failure of any mechanical or utility service shall be reported immediately to IBRL Management.
    ii. No equipment will be operated without proper training and prior permission from IBRL Management. Training for individual equipment will be provided by IBRL Management.
    iii. No equipment will be brought to, or taken into the facility without prior permission from IBRL Management
    iv. No equipment shall be removed or “borrowed” from the IBRL without permission from IBRL Management. Specific use and time frame for removal of equipment must be provided in any request to remove equipment. Borrowed equipment must be checked back in to IBRL Management to ensure functionality and cleanliness before being returned to the IBRL.
    v. Many pieces of equipment have specialized safety considerations (steam, sharp surfaces, rapid rotations, etc.). These will be mentioned during discussion of projects with IBRL Management. All manuals, SOPs, and associated materials are kept in IBRL 2044 – Technician Office.
g. Chemical Usage
    i. When using chemicals, you must have ready access to and follow precautions found in the Safety Data Sheets (SDS). Let others in the area know of potential hazards.

ii. Properly Label every container with the compound, concentration, date, and name of person who prepared or is using it.
iii. SDS Plan and documents are located at the entrance to IBRL 1010 – Pilot Plant. An oil spill kit is located in IBRL 1010 – Pilot Plant and chemical spill kits are located in IBRL 2051 – Analytical Lab.
iv. Chemicals are to be stored only in proper chemical storage locations.

h. Facility & Equipment Cleaning
   i. There is no contract cleaning in the IBRL. Groups or individuals generating trash are responsible for removing their own trash to the dumpsters OUTSIDE. There is a dumpster located directly next to the IBRL dock on the North side of the building.
   ii. Groups or individuals are also responsible for cleaning of equipment and areas that they use unless prior arrangements are made and agreed upon by IBRL Management. All users of the facility are expected to clean up the area and equipment they use. This includes the product on the floor, caught in drain traps, and product on the surface of the equipment.
   iii. If equipment is not cleaned properly, IBRL staff will re-clean the equipment and the group or individual leaving the equipment or area dirty will be billed for cleaning. Routine cleaning of floors, walls, steam pipes, etc. is the responsibility of the IBRL staff.
   iv. All waste must be disposed of per Division of Research Safety (DRS) rules.
      1. A ***Waste Disposal Decision Guide*** is included in the Safety Binders across the facility.

6. Facility Spaces & Capabilities

a. Processing & Laboratory Spaces
   i. IBRL 1010 - Pilot Plant
      1. The Pilot Processing Plant is a unique processing space to be used and occupied only by individuals and equipment with active projects. The facility is designed as a flexible space where equipment is quickly moved in and out to complete projects, careful consideration will be given to permanent installations.
      2. The Pilot Plant has 8 “suites” for private setup and running of equipment, each with its own dedicated utilities. Up to 4 suites can be connected for larger projects. Available utilities are listed above.
   ii. IBRL 1072 – Volatile Extraction Room
      1. The Volatile Extraction Room is a dedicated space for processing activities that release volatiles into the environment. The space is rated Class 1: Division 2 for electrical spark protection and features once through HVAC exhaust along with an exterior pressure blow out wall in case of failure of other safety systems. Available utilities are listed above.
      2. No equipment is to be placed in this room without prior permission of IBRL Management. All equipment placed in this space must be rated Class 1: Division 2 to maintain the rating of the room.
   iii. IBRL 1061 – Grinding Room
      1. The Grinding Room is a dedicated space for dust generating processes. The space features a dedicated exhaust capture system and sealed walls.

2. No equipment is to be placed in this room without prior permission of IBRL Management.

iv. IBRL 2051 – Analytical Laboratory
    1. The analytical laboratory is setup only for users of the IBRL space with an active project. A technician is available for assistance and will be required for completion of certain analyses.
    2. The laboratory infrastructure features (4) chemical hoods, a biosafety cabinet, and a 2-glove anaerobic chamber. Additional available equipment and utilities are listed above.

v. IBRL 1053 – Workshop
    1. The Workshop contains tools and equipment necessary for the maintenance of IBRL spaces. Only IBRL Management and employees are allowed access to this room.

b. Storage Spaces

i. General
    1. Nothing is to be stored in processing areas outside of what is being immediately used.
    2. Due to limited space, all storage areas will be maintained and monitored by IBRL Management. Requests for storage and removal of equipment or supplies need to be made to IBRL Management for approval.
    3. All materials stored must be in a suitable container and include a legible label containing the following info. (Product Name, Date In/Out, Name, NetID, Phone Number)
    4. Common food processing tools (buckets, utensils, thermometers, timers, etc.) have designated storage areas. Ensure these items are cleaned and returned after use. They should not be placed on top of, or hung on steam lines, electrical lines, or processing equipment.
    5. The IBRL is a processing, production, development, and research laboratory. It is designed to be an activity center, not a storage location. Therefore, space in the IBRL neither shall not be used for storage of excess equipment or supplies, nor is it the responsibility of the IBRL Management to locate storage.

ii. Storage Areas
    1. All supplies must be kept in sealed containers when applicable. An opened bag of ingredients or packaging material in storage areas is unacceptable. All materials must be sealed in a plastic or metal container to avoid attracting insects or rodents. The IBRL will provide a limited number of these containers, but it is best to plan on providing your own as materials without an appropriate container will be removed and discarded.

iii. IBRL 1055 & 1070 – Cold & Cryo Storage
    1. The Cold & Cryo Rooms are managed by IBRL Management. They are locked areas and are only for use by IBRL activities.
    2. The temperatures in the cold rooms are adjusted and maintained by IBRL Management and should not be changed for any reason. If a user observes a problem with one of the cold rooms, it should be reported immediately to IBRL Management.

iv. IBRL 007 – Chemical Storage

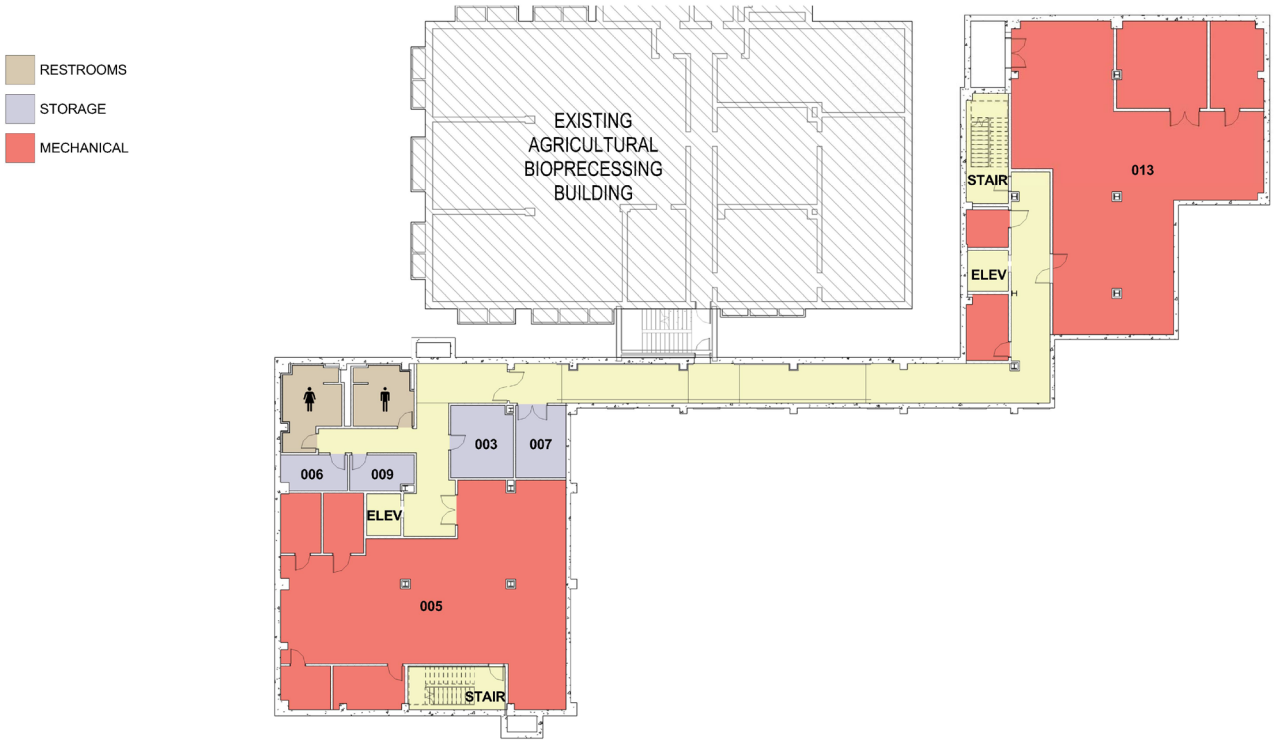
1. The Chemical Storage room is for storage of non-food chemicals, soaps, sanitizers, cleaning supplies, excess PPE, and equipment support items only. All chemicals stored must follow the ***SDS – Hazard Communication Plan.***

c. Shared Spaces
   i. IBRL 2042 – Executive Conference Room
      1. Table seating available for 14, with 4 additional chairs along exterior of room. 80" TV with AV and web conference capabilities, and credenza for storage and drinks/snacks.
      2. The executive conference room features views into the pilot plant and convenient access to the analytical laboratory. This room is only for use by IBRL Management.
   ii. IBRL 2005 – Staff Suite Conference Room
      1. Table seating available for 6. 60" TV with speakers and web conference capabilities.
   iii. IBRL 1032 – Flex Room
      1. Mobile table seating available for 14, additional chairs along exterior of room. Projector and screen with AV capabilities, audience-facing camera, and credenza for storage and drinks/snacks.
      2. When divider wall to break room is open, seating increases to 24 in classroom configuration. Teaching station available.
   iv. IBRL 1030 – Break Room
      1. Mobile seating on tables for 10, includes 60" TV with AV ports, refrigerator, microwave, and sink.
      2. Room can be joined with Flex Room with center divider opened for special events, otherwise serves as common lunch room for users of facility.
   v. IBRL 1002 – Classroom
      1. Seating for 32 in classroom configuration or can be reconfigured in multiple layouts. Projector, smart board, teaching station, and presenter-facing camera available, along with credenza for storage and drinks/snacks.
   vi. IBRL Mail & Copy Rooms
      1. Please contact IBRL Management for needs in the mail & copy room.

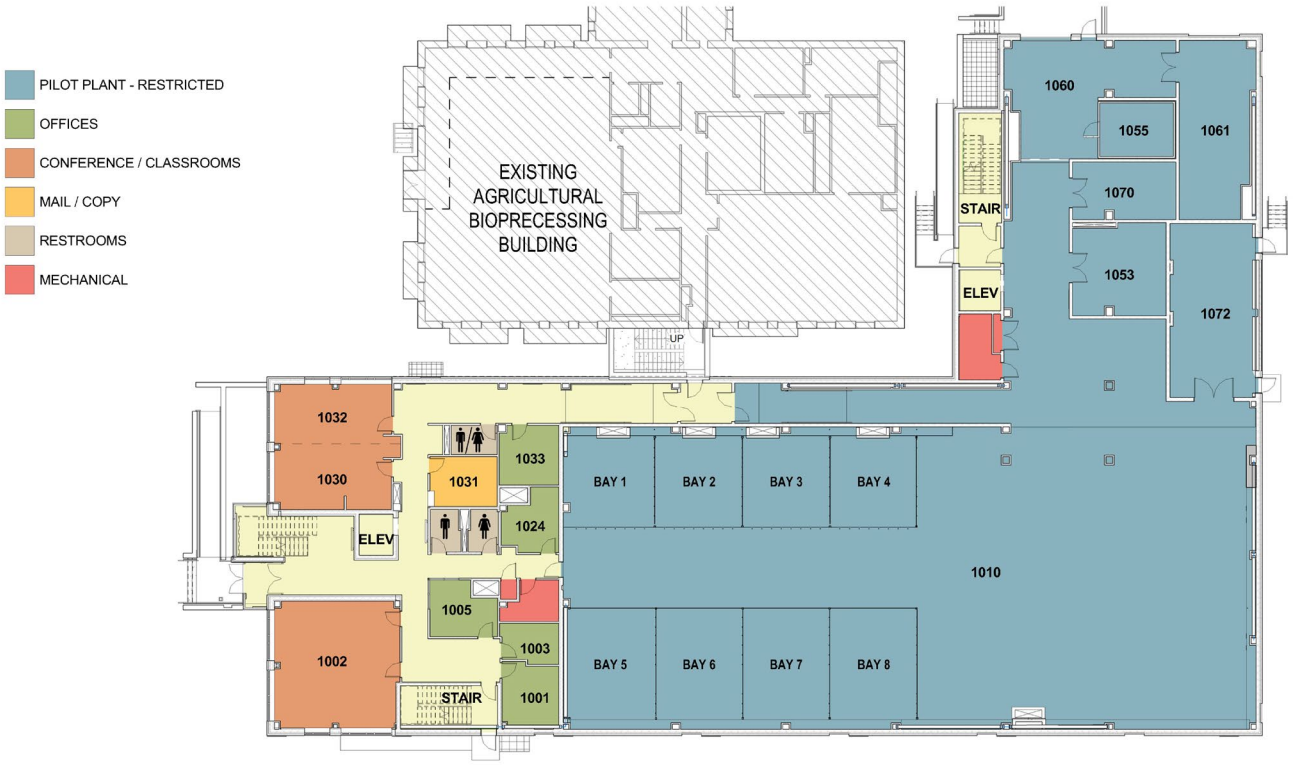
d. Offices
   i. Staff Offices
      1. Staff offices are all offices located in staff suite on SW corner of IBRL, and the technician office located near the Analytical Lab. Access to these offices is restricted to IBRL staff only.
   ii. User Offices
      1. User offices in the building are configured as single fully-furnished offices with desktop computer, ethernet access, file storage, etc. Two offices have been configured as a shared workspace with (4) smaller desks inside each.
      2. All office spaces are reserved for active users of the IBRL, with priority given to long-term projects or clients travelling long distances. All office spaces have an associated fee for use.

e. Parking
   i. IBRL does not offer parking for users. Most of campus and the surrounding community utilize the Mobile Meter (http://www.mobilemeter.us/) app to simplify paying & renewing parking. UIUC Parking (http://parking.illinois.edu) offers daily through monthly permits as well.

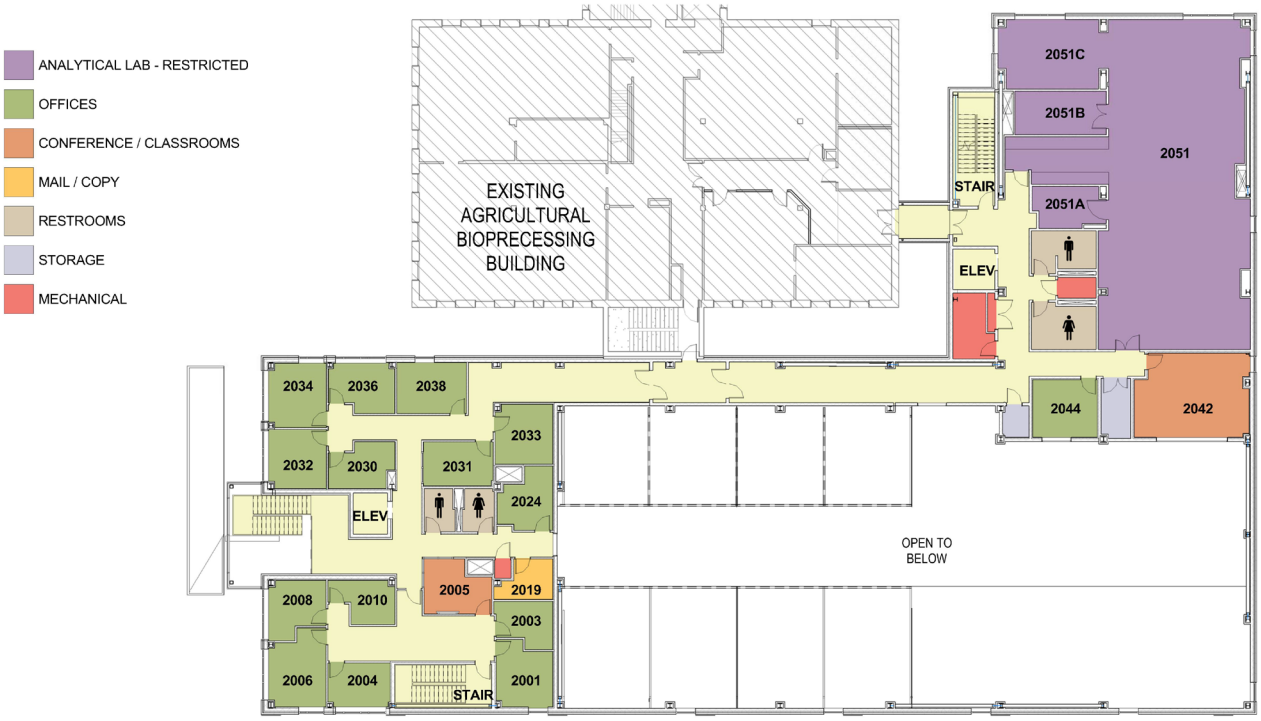
Facility Floor Plans



LOWER LEVEL



FIRST LEVEL



SECOND LEVEL