I am following up on my email about the NYT coronavirus lab article with a pdf attachment of the article.

Thank you.
Barbara Salzman

On Sat, Jun 26, 2021 at 1:05 PM Barbara Salzman [redacted] wrote:

> Please share this email with Robin, whose personal email I do not have. I have included Diana Lipari because she is now the PB liaison. I am also including John Markowitz as Chair of the Select Board. My intention is to share with the entire PB. As well, I suggest you share this with the BOH.
>
> The NYT article, ***Where Did the Virus Come From? What We Already Know is Troubling*** by Zeynep Tufekci, highlights the dangers of research lab accidents. I assume the Town is taking this very seriously and making sure that stringent regulations and an ongoing monitoring system is in place to protect the residents of Boxborough as well as our water supply. Nevertheless, accidents do happen and I urge the Town to have an emergency plan in place for such a possibility.
>
> From the NYT:
>
> *"In 2016 the Wuhan institute reported experimenting on a live bat coronavirus that could infect human cells in a BSL-2 lab — a biosafety level that has been compared with that of a dentist's office. Protective gear other than gloves and lab coats is usually optional at this level, and there's often no airflow control sealing ventilation between the work area and the rest of the building. Michael Lin, an associate professor of neurobiology and bioengineering at Stanford, told me it was "an actual scandal, recorded in print," that a SARS-like virus capable of replicating in human cells was worked on under such low safety conditions."*
>
> *"....This means putting the public interest before personal ambitions and acknowledging that despite the wonders of its power, biomedical research also holds dangers."*.....
>
> I urge you to read the entire article. I tried to copy/paste it to this email but was unable to.
>
> As well as the issues in this article, I would like to take the opportunity to express my own concerns about protecting our water supply **quantity** as well as quality. From what I understand, in order to protect water quality, water waste from research will be shipped off-site. However, I am equally concerned about water **quantity**, especially given global warming and droughts. How will our water supply be monitored? Are research labs limited to the amount of water they can use and ship off site? Is there a reporting mechanism?
>
> Thank you for all that you are doing on the Town's behalf.
>
> Best regards,
>
> Barbara Salzman

Response to Barbara Salzman

RE email of June 26, 2021

United States Standards for an American Lab with Biosafety Level 2 work is as follows:

Basics of Biosafety Level 2

The term **containment** is used in describing safe methods for managing biological materials in the laboratory environment where they are being handled or maintained. The purpose of containment is to reduce or eliminate exposure of laboratory workers, other persons, and the outside environment to potentially hazardous or detrimental materials.

The Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH) established criteria for four levels of containment called **Biosafety Levels (BSLs)**. These criteria consist of combinations of laboratory practices and techniques, safety equipment, and laboratory facilities. Each combination is specifically appropriate for the operations performed, biological materials to be used, and the laboratory function or activity.

Biosafety Level 2 (BSL2) practices, equipment, and facility design are applicable to clinical, diagnostic, teaching, and other laboratories in which work is done with moderate-risk agents that are present in the community such as; Hepatitis B virus, HIV, the Salmonellae, and Toxoplasma spp. are representative of microorganisms assigned to this containment level. With good microbiological techniques, these agents can be used safely in activities conducted on the open bench, when the potential for producing splashes or aerosols is low. BSL2 is appropriate when work is done with any human-derived blood, body fluids, tissues, or primary human cell lines where the presence of an infectious agent may be unknown.

Primary concerns at BSL2 include accidental needle sticks or cuts or mucous membrane exposures, or ingestion of infectious materials. Even though organisms routinely manipulated at BSL2 are not known to be transmissible by the aerosol route, procedures with aerosol or high splash potential is to be conducted in a biological safety containment cabinet to minimize laboratory personnel exposure.

Basics of Biosafety Level 2

- Limit access to work areas. Close doors during work with research materials.
- Post biohazard warning signs at access points and on equipment containing or contaminated by potentially infectious materials.
- Wash hands after handling biological materials, removing gloves, or before leaving work area.
- Don't eat , drink, etc. in the work area.
- Never mouth pipette.
- Use sharps only when no alternatives (e.g., safety devices or non-sharps) exist.
- Take extreme precautions when sharps must be used. Dispose of sharps carefully and properly.
- Conduct procedures likely to create splashes, sprays, or aerosols within a biological safety cabinet that is certified annually.
- Decontaminate work surfaces at least daily.
- Decontaminate waste materials before disposal.
- Wear a BUTTONED lab coat to protect street clothes.
- Wear gloves when hands may contact potentially infectious materials, contaminated surfaces, or equipment.

- Wear eye/face protection if splashes or sprays are anticipated during work outside a biological safety cabinet.
- Transport materials outside of the laboratory using secondary containment and a cart. Avoid public areas during transport.
- Transfer materials to and from the Boxborough facility according to federal and international regulations.
- Be familiar with written instructions for laboratory procedures and proper responses to emergencies.
- Report spills, exposures, illnesses, and injuries immediately.

These standards are in effect for most Hospital Medical Labs and General Medical Testing Laboratories in Massachusetts. These labs are where most of the Physician requested patient tests are done when Physicians are looking for diagnostic information.

The Boxborough Board of Health has implemented Biosafety Regulations to monitor the work in Labs and any development/production of vaccines for medical use. These regulations are posted on the Board of Health webpage.

The Board does not know if the Wuhan lab you refer to in your letter meets these same Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH) established criteria for Biosafety Levels (BSLs) since this lab is in a foreign country.

The Biologic Facility proposed in Boxborough is required to meet these Federal and State requirements to maintain operations. This includes monitoring of the production facility procedures and process on a regular basis by a Biosafety Team that is required to include identified representatives from the Town and the production facility.

The wells providing water for this facility constitute a privately owned public water supply regulated by the Massachusetts Department of Environmental Protection (DEP). These wells are permitted and monitored by DEP and testing information is reported regularly to both DEP and the Boxborough Board of Health. The wells as constructed have limitations on the amount of water that can be withdrawn in accordance with DEP permits. Our understanding is that these rock wells have been reviewed by DEP and have had a DEP water system study done to meet certification by DEP for operation.

Cindy and Simon,

I am sending this email to you both - Cindy as the Planning Board member chairing the public hearings on the Arranta Bio Site Plan Review, and Simon as the Town Planner. I have copied Mark Barbadoro as the Chair of the Planning Board for his awareness.

The Economic Development Committee met on August 19th and discussed the Arranta Bio Site Plan Review and Planning Board public hearings on the subject. Discussion centered on the questions that were raised by Planning Board members and the public with respect to the products and processes that Arranta Bio is planning, the bio-safety aspects of those products and processes, and the handling of potential changes to the same. The EDC also discussed the importance of Arranta Bio (as a related operation to Vibalogics) and its pending occupancy of 1414 Mass Ave to the town from an economic and community perspective.

The EDC believes that businesses and property owners need clarity and efficiency in all processes in town, as the town looks to fill vacant spaces while ensuring it is done safely for residents and our community. We believe that the town needs to bring to bear its collective resources across all boards, committees and departments to proficiently and efficiently work with businesses and property owners to review and permit operations in a safe and practical manner. To this end, the EDC is available to help the Planning Board with this application (and others), to facilitate cross board, committee, and department engagement as may be necessary, or to support the process in any other way we can.

Very respectfully,

Rich Guzzardi
Chair - Boxborough Economic Development Committee

Hi,

I'm a Boxborough resident with experience in biotechnology research and development for working at several different companies/academic institutions for the past 30 or so years. I was pleased to hear about companies like Vibralogix and Arranta Bio coming to town to help with our tax base but was also initially concerned about the town's ability to properly regulate their operations since it is something new. I was encouraged to see that the Boxborough Board of Health adopted Biological Safety regulations on 3/31/21 that include an annual permitting process. The annual review is particularly important for contract manufacturers like Viralogix and Arranta Bio who may change their product focus depending on their customers and desired products. My understanding is that Biological Safety applications and permit renewals are going to be reviewed by the Board of Health, supported by technical adviser(s), and that the BoH will designate a representative to the Institutional Biosafety Committee for each company. I believe that this arrangement could provide good oversight of the two biotechnology companies currently operating in town and would be interested in assisting in BoH review of the Biosafety applications as a technical adviser or in another capacity. I'm familiar with the technologies being used at both Arranta and Vibralogics so believe that my expertise could be useful. I'm happy to send more information on my background if that helps.

I've been getting involved in discussion about biosafety in Boxborough, at Town Meeting and at the recent Planning Board meeting with Arranta Bio on August 9th, so have a few observations/recommendations:
- While the BoH may have the bandwidth for monitoring two biotechnology companies, it may be beneficial for the town or the BoH to stand up a separate town Biosafety Committee if the number of companies increases to the point where permitting, inspection, and review become too much of a burden.
- There seems to be some overlap between the role of the Planning Board and the BoH in regulating biotechnology regulations. I'm just learning about the town committee's and their responsibilities, but please let me know if I can help with that in any way.
- I feel it is important for the BoH to better engage the public on the incoming biotechnology companies and town regulations/oversight. One possibility is to give an opportunity for incoming companies (or require them?) to give a public presentation about their products/operations as well as a time for town residents to voice their concerns. This public discourse would give residents a chance to better understand the benefits and risks of the company's biotechnology and to help with future discussions about regulations and biosafety.
- I've reviewed the adopted biosafety regulations, which I think are based on those from the town of Beverly, and have some suggestions for possible improvement. These are listed below.

1) On Page 2, Section 4: the definition of "Biological Agent" and "Regulated Biological Agent" is very narrow in that it includes only microorganisms or infectious substances. It should be expanded to include any organism (plants and animals), cells derived from any organism, biomolecules such as nucleic acids, proteins, lipids, etc., bionanoparticles (liposomes, for example), and other biotechnologies. While these might not have the human-to-human transmission potential of some infectious agents, they have the potential to cause significant issues if handled improperly. Not an issue with the current companies but may be in the future.

2) More attention should be given to the use of recombinant DNA (rDNA) technology in general and particularly in instances other than producing engineered microorganisms. There are numerous other new applications of rDNA (plants, animals, insects, cells, nucleic acid vaccines, in vitro synthesis, etc.) where the type of use and implemented safety measures should be more closely monitored. These are not necessarily more dangerous but there is less of an understanding of the potential health and environmental risks associated with many of these technologies since they are new.
- Section 7, Part D requires listing of all biological agents utilized, any inserted gene sequences that would elevate risk (e.g, oncogenes), the BSLs assigned after BSL review, etc. I feel that the underlined statement is open to interpretation (who judges that a gene would elevate risk?, why only inserted genes?) and should be strengthened to include description of all recombinant or synthetic nucleic acid (nature of insert or target gene, vector, source organism, recipient strain or cells, oncogenic potential, source from pathogen or toxin, protein expression, % of viral genome in insert) being used on the premises and the intended use.
- Special attention should be paid to:
  - the use of viral vectors in research or production, including detailed information on the vector system
  - the use of nanoparticles for delivery of recombinant DNA/RNA
  - the production or use of transgenic animals, insects, or plants
  - the use of human source material (generally considered BSL2)
- I believe there are NIH or other risk categories for rDNA work that could be used as guidelines for the town.

4) Section 9, Part D: should read "...shall not be permitted at any one time..." Also, liters should be used instead of gallons for units since that is industry standard. It also may be prudent to regulate by the vessel size, "use of more than 1,500 L of live culture in a single vessel". This limit could be adapted for risk level, for instance 500 L of BSL-2 or 5,000 L of BSL-1. My understanding is that Arranta Bio is requesting a waiver for this limit since they are planning to use 2,500 to 5,000 L bioreactors. My recommendation is that this should not be a blanket waiver but only be for a particular product. Each new product should require a new waiver. This enables better assessment of the risk for each waiver request. For instance, their current manufactured product involves no infectious agents or rDNA but this may change in the future.

5) I would suggest adding the option for an annual inspection by the BoH and/or their advisors to the regulations so that the town could, if needed, get additional visibility into any potential issues and/or identify regulatory issues that have not been anticipated.

6) As written, the reporting requirements for a biotechnology company to the BoH are redundant. The company needs to submit minutes from the company IBC meeting with details of each project and protocols (Section 7D), an annual report with IBC minutes and a bunch of other information (Section 6E), and an annual permit application (Section 9). Plus there is some difference in reporting dates. Much, if not all, of the same information will be contained in each of these, so they should be consolidated. Also, since two Boxborough residents will be in attendance at the IBC, the IBC reporting requirements could potentially be relaxed.

7) Similarly, Sections 6F and 9F: each of these describe incident reporting but seem to have different requirements. These should be harmonized.

Please let me know if I can help implement or execute these changes, or if you have questions or would like additional information. I'm happy to get more engaged. Thanks.

Best,
Jim Comolli
451 Sargent Road