

**SAN FRANCISCO BIOSCIENCES TASK FORCE**

**REPORT TO**

**THE SAN FRANCISCO BOARD OF SUPERVISORS**

**AND**

**THE PLANNING COMMISSION**

**FEBRUARY 15, 2005**

# **BIOSCIENCE TASK FORCE REPORT**

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## **INTRODUCTION**

Unlike some Bay Area cities that are home to many life science firms, San Francisco does not expressly identify life science or bioscience (these terms are used interchangeably in this report) within a land use category. Presently, bioscience laboratories are permitted as a use in the industrial zones through a 1988 Zoning Administrator interpretation, and generally, in the downtown commercial districts. The lack of clarity in the Planning Code creates uncertainty for both life science companies and community members about the appropriate location for the industry in San Francisco as it grows in the future.

By Resolution 217-03 (attached as Appendix I), the Board of Supervisors charged the Biosciences Task Force (Task Force) with developing recommended policies for consideration by the Planning Commission and the Board itself on land use and zoning controls for bioscience industries in areas outside of the Mission Bay, Hunters Point Shipyard and Hunters Point Redevelopment Areas, including how to define a land use classification and zoning districts for the Planning Code that includes biosciences, which allows laboratory space as an accessory use to non-industrial uses; and where to permit as of right, conditionally permit or prohibit bioscience.

The Task Force appointed subcommittees to discuss the following issues: Functional Definition of Bioscience; Land Use and Zoning (the "Ad Hoc" Committee); Industry Location Criteria; and Cost/Benefits (subsequently renamed Community Perspectives). Detailed reports from our research and the committees are appended to this report.

Because land use in San Francisco includes community acceptance as well as zoning, the Task Force agreed to give consideration to other issues that relate to the mandate of the resolution, particularly those issues that reflect the concerns of the community regarding the safety of bioscience uses. A major concern is that of environmental health and safety for workers and neighbors.

Even though the primary focus of the Task Force was to consider land use issues outside of the Redevelopment Areas, the Task Force Recommendations made under the Environmental Health and Safety (EH&S), Community Concerns and Economic Development/Training and Employment sections should apply to life science companies citywide, including the Redevelopment Areas.

## **PERMITTING RESEARCH AND DEVELOPMENT SPACE OUTSIDE THE REDEVELOPMENT AREAS**

The University of California San Francisco (UCSF) alone has spun-off around sixty to seventy start-up life science and bioscience companies. Many of these companies, located in the Bay Area, are now leading drug, diagnostic and medical device companies, and have grown into

internationally recognized entities. However, none of these companies have located in San Francisco.

Start-up companies require costly specially designed and equipped laboratory space meeting strict regulatory requirements to conduct their research and development (R&D). Start-up firms are largely financed by “angel” and venture capital funds. . During the long R&D process their scarce financial resources must be husbanded for many years before they actually generate revenues, let alone profits. Start-up companies must respond to their investors who implore them to conserve capital by locating in reasonably priced space, usually, at the beginning, in leased space.

To succeed, these start-up companies typically require smaller square footage (2,000 to 10,000 square feet) and possibly “incubator” laboratories with shared common facilities. To develop this type of specialized laboratory space, meeting complex health, safety, building code and research standards is several times more expensive than typical commercial space.

The 300-acre Mission Bay redevelopment project, housing the 43-acre UCSF life science research and healthcare campus, has land reserved for two million square feet of R&D space adjacent to the UCSF campus. The developer has struggled to secure commercial tenants. Buildings built on bay fill require foundations above grade and must be constructed on expensive piles driven down to bedrock. The redevelopment agreement imposes premium developer exactions on space constructed. The significant costs associated with construction and exactions are anticipated to make Mission Bay's commercial bioscience campus more suited for larger, established companies needing large floor plates than for small life sciences incubators. UCSF's campus could be the magnetic and synergistic key to finally attracting life science companies to start or relocate to San Francisco.

Until very recently, no developer had stepped forward to develop bioscience laboratory space at Mission Bay. Alexandria Real Estate Equities, a national developer specializing in R&D space for pharmaceutical companies, has now bought several parcels zoned for 1.4 million square feet of commercial office and laboratory space. On January 5, 2005, Alexandria announced plans to break ground in the spring of 2005 on a 165,000 square ft. commercial building at 16<sup>th</sup> and Owens Streets. This building will include space for small, early-stage biotech companies and also slightly bigger companies, as well as high-end office space to be leased to legal, financial and venture capital institutions, probably serving bioscience firms.

Notwithstanding Alexandria's plans for this "spec" incubator friendly building, it is unclear whether Mission Bay will be an affordable or readily available place for small-stage companies who want to cluster around UCSF and larger companies.

San Francisco, to foster UCSF spin-offs and other start-up companies desiring to locate in the City, may want to zone areas near Mission Bay to create additional opportunities for these laboratories and R&D facilities. These companies need turnkey facilities that are designed and

equipped for R&D. In areas outside Mission Bay, it would be possible to reuse existing buildings or construct moderate sized facilities for small tenants. Even though the cost of converting existing industrial space will still be significant because of the special requirements for laboratory buildings, the space would be lower priced than that likely to be found within Mission Bay. Ideally, some of this non-Mission Bay space would be in incubator facilities that will allow researchers' creative ideas to be nurtured through the fragile and costly R&D phase. Later on these firms may move into other space in Mission Bay or other redevelopment areas that meet the needs of a growing company.

In addition, the industry needs facilities for manufacturing and production, which may be more appropriately located in the industrially zoned areas now referred to as "Production, Distribution and Repair" (PDR) areas (defined below), utilizing adaptable warehouse or light industrial space, as long as that conversion does not supplant needed traditional PDR industries. If regulated with proper balance, such life science uses could help maintain the vitality of the city's industrial districts, and nurture home grown firms that can contribute to the long-term economic, fiscal and employment health of the City.

With development of appropriate zoning in the proposed PDR zones and other zoning districts for startup R&D companies and bioscience manufacturing and production, San Francisco could capture a portion of the forecasted 32% growth in biotechnology and pharmaceutical employment, as well as indirect jobs over the next ten-years.

## **BENEFITS AND CONCERNS ABOUT THE BIOSCIENCE INDUSTRY**

It is safe to say that there are varying opinions among San Franciscans about bioscience. There are clearly a number of potential economic benefits to the City and its workforce from the industry. However, there are also lingering community concerns about the unknown economic, social and environmental impacts. This report attempts to flesh out the range of potential "pros" and "cons" from both a citywide economic development perspective and from a local community perspective.

Based on the report prepared by Todd Ewing of the San Francisco Center for Economic Development and by Task Force members Michael Costa and Dick Morton, (see Appendix II: Benefits of Bioscience for detailed information), the potential benefits of the bioscience industry for San Francisco and its workforce are multiple and include:

**Leveraging Existing Advantages:** Economic development and jobs occur as a result of private sector activity that flows to areas with existing advantages. In UCSF and its Mission Bay life science campus, San Francisco has a significant advantage that can be leveraged to benefit our economy and expand a range of employment opportunities for residents. This economic activity will generate revenues to fund essential city services.

**Diversifying the Economy:** To date, the drivers for San Francisco's economic growth have been clustered in a handful of industry sectors – financial services, business and professional services, information technology, tourism, retail and telecommunications. Broadening and diversifying the economy to include additional sectors will enhance the economic security of the City and make it less susceptible to downturns in any single industry. Capturing a growth sector – bioscience - in the U.S. economy will reinforce and strengthen existing economic sectors in the City.

**Providing Jobs Across the Economic Spectrum:** Although the needs of each employer differ dependent upon the type of company and its development stage, employment within the bioscience industry is available to individuals with a range of educational backgrounds and skill levels. San Francisco already has strong bioscience training and education programs to link residents to new bioscience job opportunities. Life sciences executives believe the availability of a skilled workforce to be among the most important factors contributing to business success.<sup>1</sup> (See Appendix III, Bioscience Employment and Training Report, prepared by Theresa J. Feeley, a Task Force member and Executive Director of SFWorks, a workforce development intermediary organization affiliated with the Chamber of Commerce.)

### **Enhancing the Tax Base**

The City recently approved a payroll tax exclusion to apply to bioscience companies for 7.5 years. Some view this as ensuring that the tax base enhancements from bioscience companies will not be realized for many years, or that the City gave away a lot. However, advocates for the tax policy say:

1. The payroll tax is unique to San Francisco. This was a competitive disadvantage compared with other Bay Area cities, whereas property taxes are comparable in all jurisdictions.
2. There was a very small base of bioscience companies that were paying payroll tax when the exemption was approved, and none of those companies (primarily device manufacturers or bioinformatics firms) are eligible for the payroll tax exemption. They will continue to pay payroll as well as property taxes. One R&D company (FivePrime), which moved into the Gladstone Institutes building in Mission Bay after the payroll tax exemption was approved, would not have relocated to San Francisco without it.
3. Bioscience companies will end up paying much more in property taxes than traditional commercial occupancies because bioscience facilities are built out at much higher cost per square foot than other commercial space. Office buildings typically have tenant improvements to the shell of the building added in the \$30-\$50 per square foot range, whereas biotech companies have laboratory improvements to the shell of the building that cost anywhere from approximately \$250 to \$500 per square foot. In other words, property tax is paid on a bioscience building anywhere in the range of \$200 to \$450 per square foot more than office buildings.

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<sup>1</sup> Bay Area Life Sciences Clusters of Innovation Quantitative Survey, 2002 in *Taking Action for Tomorrow: Bay Area Life Sciences Strategic Action Plan*.

4. The "multiplier effect" for bioscience companies is much higher than for other industries - some estimate the multiplier factor to be as much as five. In other words, for each job created in bioscience, up to five jobs are created in supporting economic sectors.

As the presence of the bioscience industry in San Francisco may have both positive and negative impacts on our neighborhoods and communities, the Bioscience Task Force has considered the bioscience industry in the context of overall economic development objectives of San Francisco.

**Direct and Indirect Impacts:** Consideration about economic development policy decisions should be given to multiple goals simultaneously: a sustainable diverse economy that meets neighborhood and city wide economic needs, meaningful well-paying jobs for all city residents, and addressing environmental health and safety. It is important to ensure that both direct and indirect impacts of bioscience uses be considered and balanced in the City's approach to locating and accommodating the life science industry. The perspective here is not to fuel a debate for or against bioscience but rather to create a dialogue on how best to develop these industries.

Some of the recommendations included in this report are intended to mitigate these community concerns.

**Environmental Justice:** The City of San Francisco has made a commitment to applying environmental justice principles and taking a precautionary approach to decision-making where public health and the environment may potentially be impacted.

As there is little space left in San Francisco for industrial growth besides the southeast sector of the city, issues of environmental justice become immediately relevant. In the past, San Francisco has made land use decisions with little regard for the impact on health or the environment, to the detriment of neighborhoods of concern. As a result, the residents in that sector are overburdened with activities that have known or potential negative health impacts.

**Health and Safety and Community Education:** With regard to attracting the bioscience industry to San Francisco and where that industry might locate, San Francisco must consider the impacts such location will have on residents. While the industry may be convinced that bioscience activities proposing to locate in San Francisco pose little or no threat of harm to the residents, the impact of not proving that to residents can lead to opposition that would become a deterrent to businesses locating in the City. For example, if every time a new business attempts to move to San Francisco, local residents oppose the location and require that additional steps be taken to protect residents from unsubstantiated, but perceived, hazards, businesses would see that as a negative and chose not to locate here. Therefore, a plan should be developed to educate residents of the potential benefits of the industry, the health and safety regulatory framework that exists to minimize the opportunity for exposure to harmful substances and activities, and the efficacy of locating all the activities in the same general area.

In this report, the Task Force has addressed the issues of industry-related physical hazards in a direct way, but a substantial discussion or debate about a number of potential economic and

social impacts has been outside the purview of the Task Force. This limitation needs to be specifically acknowledged, as it is critical to understand these potential impacts through meaningful public dialogue. San Francisco residents need accurate information with which to judge both economic and environmental impacts and the opportunity to have their opinions counted in the policy process. Only limited community outreach has occurred in this regard so far. See the report prepared by the Task Force's Community Perspectives Subcommittee in [Appendix IV - "Biotech, how?"](#) for some additional concerns as well as the Board of Supervisors Office of Legislative Analyst (OLA) Bioscience Report.

## **BIOSCIENCE LOCATION FACTORS**

The Bioscience Location Factors subcommittee of the Task Force reviewed a wide variety of research, including a survey of interviews with 88 life science leaders, to determine what factors influence a firm's decision making about where to locate. The results of this review indicate that the presence of high quality research institutions such as UCSF and a quality workforce, access to available capital and the overall costs of doing business are the three most important factors in a life science firm's decision process. San Francisco scores very highly on the first two factors compared to the rest of the country. The bioscience payroll tax credit was a positive policy step by the Board of Supervisors and the Mayor to reduce startup costs for businesses considering locating in San Francisco. Proactive zoning and land use regulations can impact cost factors. Please see [Appendix V: Bioscience Location Factors](#) for a presentation and discussion of these issues.

## **WORKING DEFINITION OF BIOSCIENCE**

For the purposes of this report, life sciences and bioscience are used interchangeably. The life science industry in the Bay Area can be divided into three subsections: 1) the diagnostics section involves the creation of products and services used to analyze and detect various illnesses; 2) the therapeutics sector designs products that cure illnesses; and 3) the supplier sector provides capital goods and services, machinery, instruments, software and reagents related to research and production. Long product cycles, high private expenditures for research and development and complex regulatory approvals, as well as a tendency to form geographic clusters, are all factors that characterize the bioscience industry.

A more detailed definition of the bioscience industry can be found in [Appendix VI](#), the report of the Land Use/Zoning subcommittee of the Task Force.

## **BIOSCIENCE: DIVERSE USES**

Bioscience is a mix of uses including research and development laboratories (sometimes including vivaria), research office, administrative office, and warehouse and equipment areas. The type of business, research science, or product manufacturing, determines the concentration of each use.



The Planning Department, as part of the *Better Neighborhoods 2002* process, has studied Production, Distribution and Repair (PDR) activities in San Francisco<sup>2</sup>. Like traditional PDR, Bioscience activities can be grouped into core, medium and light activities based on a number of factors: the total amount of building space required for the business; the amount of space needed per worker; the amount of space required for equipment and storage, both inside and outside; the type of loading facilities required; the amount of trucking activity generated; hours of operation; as well as some of the environmental impacts such as noise, odors, lighting and the treatment of hazardous and/or infectious materials. These activities are more fully described in Appendix VI.

### **Light Bioscience Use**

This category includes a range of uses that cluster for potential collaborative business ventures. These uses include biology and chemistry labs, vivaria/animal facilities, and computational research/ bioinformatics labs, requiring only small amounts of trucking or noisy outdoor support areas. Administrative offices are usually required to support these operations but are typically not a principal use. Computational research and bioinformatics are principally an office use but rarely are a primary use of a bioscience operation. Computational research and bioinformatics uses may be permitted in all commercially zoned districts of the city.

### **Medium Bioscience Use**

Research and development of biopharmaceutical products requires scaled up processes that create greater volumes of material for testing and proving compliance with regulatory requirements. Facilities and their environmental impacts are measured by the volume and type of material they produce. Because increased volume increases noisy equipment, cooling towers, chillers, boilers, and air compressors, material handling is more intense in pilot production, and operations may require extra shifts to meet demands for development cycles, the use is less compatible with a mixed-use environment. *A buffer zone from non-industrial uses may be appropriate.*

### **Core Bioscience Use**

Core bioscience uses include those businesses in diagnostics, therapeutics, or suppliers that are manufacturing, distributing and selling commercial products. The requirements outlined in the Planning Department's definition of Core PDR<sup>3</sup> apply directly to core bioscience uses. Truck access to and from freeways is critical for core bioscience uses. Manufacturing facilities typically require utility yards and expansive paved support areas on the site to maintain and service the supporting systems. Equipment requirements in core bioscience areas are

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<sup>2</sup> The Central Waterfront Neighborhood Plan, December 2002, Appendix 3, Understanding Production, Distribution and Repair.

<sup>3</sup> Ibid - Understanding Production, Distribution and Repair

significantly more intense than in pilot plants and clinical manufacturing facilities as the volume of production in core areas is higher. Service yards with noisy equipment, cooling towers, chillers, boilers, and/or air compressors are in constant operation. These areas are not compatible with residential uses unless sound abatement is deployed. These uses are unlikely to be housed in San Francisco.

## **EXISTING REGULATORY FRAMEWORK**

Bioscience firms that contain "wet" laboratories (laboratories handling biological materials) are regulated like hospitals in terms of how they operate and how they must dispose of biohazards and medical waste. A complex set of federal, state and San Francisco laws apply to bioscience firms, including regulations pertaining to onsite hazardous materials, air and water quality, waste disposal and occupational safety. The Fire, Building and Health Departments oversee many of these regulations in San Francisco.

San Francisco and other cities rely on the Uniform Building Code (UBC), Uniform Mechanical Code (UMC), Uniform Electrical Code (UEC), and Uniform Plumbing Code (UPC) to deal with issues of life safety, energy efficiency, and engineered systems (utilities) compliance. The Building Department has responsibility for the uniform codes and specific city code implementation. The Fire Department requires a Hazardous Material Management Plan (HMMP) for accounting, regulating, and preparing the emergency team for occurrences at all bioscience facilities. The Planning Code governs issues such as use, use size, parking, traffic, and building design. The Health Department regulates certain provisions of state regulations, including Hazardous Waste Control, Medical Waste and Air Quality.

The National Institutes of Health has established and regulates biosafety hazard levels (BSL). Equivalents of BioSafety Laboratory Levels 1 through 3 can be found in San Francisco. These NIH Biosafety levels are essential regulations for employee and community safety.

### **a) BioSafety Level 1**

- Used for bioagents not known to consistently cause disease in healthy adults.
- Standard microbiological laboratory practices
- **Where they are located: high school or college labs and research institutions**

### **b) Biosafety Level 2**

- Used for a broad spectrum of bioagents in the community and associated with human disease of moderate severity.
- Limited access separated from public areas, plus enhanced microbiological practices that are identified before work begins.
- **Where they are located: research institutions, essentially all hospitals and medical and veterinary schools, dental offices and medical laboratories.**

**c.) Biosafety Level 3**

- Used for bioagents with potential for aerosol transmission that may cause serious or potentially lethal disease by inhalation if left untreated.
- Workers are immunized for agents handled or potentially present.
- Biosafety Level 2 practices and controls plus controlled access and appropriate biological safety cabinets that are totally enclosed.
- Materials being removed are sterilized by heat and pressurized steam; all waste is disinfected and disposed of according to local, state and federal regulations.
- **Where they are located: biological research institutions, hospitals and medical and veterinary schools.**

**c) Biosafety Level 4**

- Used for dangerous and exotic bio-agents that pose a high risk of life-threatening disease for which there is no available vaccine or therapy.
- This is the highest level of containment for biological organisms.

**The first three NIH levels are appropriate for San Francisco and exist in some form throughout the City. The Task Force recommends that no BioSafety Level 4 laboratories should be located in San Francisco.**

The Board of Supervisors Office of the Legislative Analyst (OLA) Bioscience Industry report dated June 26, 2002 (see Appendix VII) contains a Regulatory Framework Chart that indicates the agencies responsible for enforcement of health and safety regulations for employees and the community.

A draft Bioscience Use and Potential Impacts Matrix (Appendix VIII) has been prepared by Task Force member Scott Williams to provide detailed information about all regulatory agencies and their jurisdiction. When completed, it will be valuable as a reference guide to the regulatory environment of the bioscience industry.

The OLA report did not find an example of a jurisdiction in California that has adopted health and safety controls specifically for bioscience firms. However, Cambridge, Massachusetts, which is comparable to San Francisco in terms of having residential uses near commercial/industrial uses, passed a Recombinant DNA ordinance in 1976 out of concern for the release of genetically altered organisms into the community. This ordinance has come to represent an opportunity to work constructively with companies that have made Cambridge their home. The Cambridge BioSafety Committee (CBC) staffed by unaffiliated Cambridge residents carries out enforcement of the Cambridge rDNA Ordinance (based on the requirements of NIH Guidelines for Research Involving DNA Molecules). The CBC meets monthly.

*The Task Force recognizes that enforcement of existing federal, state and local regulations is a serious concern, and this concern will be addressed in our recommendations.*

## **SUMMARY OF EXISTING ZONING REGULATIONS**

According to the June 26, 2002 OLA Report on the Bioscience Industry, the Planning Code does not include the term "bioscience" in the use classifications of the Code. However, a 1988 Zoning Administrator bulletin clarified which zoning districts permit Research and Development (R&D) facilities. (See Appendix IX) The Zoning Administrator defined an R&D facility as a facility that has as its primary purpose scientific or technical research and development activities, including several subcategories of uses that relate to bioscience activities, such as research laboratories, equipment and support facilities. Consequently, bioscience laboratories are permitted as a primary use only in the industrial zones, and generally, in downtown commercial districts.

Planning Code Section 313.1 requires developers of R&D projects to contribute to affordable housing through fees or housing construction. Bioscience is included expressly in the R&D category defined as "space within any structure or portion thereof intended or primarily suitable for basic and applied research or systematic use of research knowledge for the production of materials, devices, systems, information or methods, including design, development and improvement of products and processing, including bioscience, which involves the integration of natural and engineering sciences and advanced biological techniques using organisms, cells, and parts thereof for products and services, excluding laboratories which are defined as light manufacturing uses consistent with Section 226 of the Planning Code".

The Planning Code does not contain a use category that encompasses all of the various functions that may make up a contemporary bioscience facility. Consequently, the Planning Department has discretion in characterizing the principal use of a bioscience firm and in determining where bioscience firms are allowed. The lack of a clear category definition and open-end Planning Department discretion has been cited by life science companies looking at San Francisco as a potential location as a major barrier.

## **REZONING PROCESS FOR THE EASTERN NEIGHBORHOODS**

The Planning Department has been engaged in planning for the Eastern Neighborhoods since January 2002 (*Profiles of Community Planning Areas, San Francisco's Eastern Neighborhoods*). The Eastern Neighborhoods encompasses areas including Showplace Square, areas of South of Market east of 4<sup>th</sup> Street, the Northeast Mission, parts of lower Potrero Hill, and parts of Bayview/Hunters Point. Many of San Francisco's industrial zones and heavy commercial zoning districts are located in these areas. The Central Waterfront Area extends from Mariposa Street to Islais Creek, east of the 280 Freeway. Various types of PDR zoning districts that permit Light, Medium and/or Core PDR uses with or without residential uses, are proposed to replace industrial and heavy commercial zones in the Eastern Neighborhoods areas.

In February 2003, zoning options were presented to the Planning Commission. The Planning Department proposed to rezone many parts of the Eastern Neighborhood areas to preserve production, distribution and repair activities, or PDR uses. Shortly thereafter, a draft definition of PDR uses was introduced. These controls are under environmental review. Because the new zoning has not yet been formalized, there is a concern that rampant land speculation threatens to force out industrial uses.

The Board of Supervisors has approved legislation introduced by Supervisor Sophie Maxwell to formally set 12 month interim controls governing Showplace Square, lower Potrero Hill, and areas proposed for PDR in the Eastern Neighborhoods Plan.

*The Biotechnology Task Force endorsed the interim controls, which will enable the Task Force recommendations to be considered, and the fast-tracked analysis of whether there is sufficient PDR land in San Francisco to be prepared in advance of the EIR and incorporated into the environmental analysis.*

PDR uses are sorted into Light PDR (limited externalities such as noise, trucking and odors), Medium PDR (more production and distribution oriented than Light PDR, more externalities with moderate to heavy trucking) and Core PDR activities (production, assembly, repair and processing oriented, many externalities including heavy trucking). Bioscience uses are not defined in the definitions of PDR activities, so it is unclear as to how bioscience would be treated vis-à-vis PDR uses.

*At present, bioscience laboratories are permitted as a primary use only in the industrial zones, and if the industrial zones are replaced by proposed PDR zoning districts, it is not clear how bioscience labs and other uses will be treated in the new PDR zoning districts. The Task force recommends that those functions be allowed in limited defined areas.*

## **BIOSCIENCE TASK FORCE RECOMMENDATIONS**

Based on our research over the past year, the Bioscience Task Force recommends that it is appropriate to encourage life science firms to locate in limited areas of industrial zones outside the Mission Bay, Bayview Hunters Point and Hunters Point Shipyard Redevelopment areas, especially reserving space for start-up companies and manufacturing and production, subject to land use and environmental health and safety controls.

The Task Force has made recommendations regarding land use and zoning controls; environmental health and safety regulations; and how economic development, training, employment, and community concerns can be addressed.

### **I. LAND USE AND ZONING CONTROLS**

The Planning Department's *Better Neighborhoods 2002* planning process for the Eastern Neighborhoods and the Central Waterfront Area provide a framework for establishing land use controls in limited areas that are currently zoned for heavy commercial or industrial uses - the prospective PDR areas. A subcommittee of the Task Force has developed prospective Overlay Zones and Zoning Controls that should be addressed by the Planning Commission as part of the Environmental Impact Report for the Central Waterfront and Eastern Neighborhoods, and, as appropriate, enacted as life science land use and zoning controls by the Planning Commission and the Board of Supervisors. The report is attached as Appendix VI - Land Use/Zoning Committee Report.

In general, the areas immediately adjacent to UCSF Mission Bay and along the 3<sup>rd</sup> Street corridor and connecting to the India Basin Industrial Area between Mission Bay and the Hunters Point Shipyard offer the most promising sites for clustering life science businesses. It is critically important that interim controls protect the PDR areas from parcel-by-parcel rezoning until comprehensive planning is completed. The following discussion reflects the key recommendations of the committee's report and additional input from other Task Force members.

It is important to note that since the Task Force members represented multiple constituencies and perspectives on bioscience in San Francisco, the land use/zoning recommendations resulted from a deliberative process of balancing and weighing the broad range of issues and concerns raised by Task Force members. This process included sound technical analyses and serious consideration of health and safety concerns and industry practices. Although the Task Force did not vet its discussions widely with the public, the debate and discussion of the Task Force took into account the diverse opinions of its members, resulting in the recommendations below.

- **Recommendation:** Bioscience use classifications based on the definitions in this report should be adopted in the Planning Code to allow regulation of the industry as a specifically identified use type.

- **Recommendation:** Bioscience should be treated as a mixed use in the Planning Code, comprised of research and development laboratories, research offices, offices, vivarium, warehouse and equipment areas, as discussed earlier in this report. Appendix VI contains a list of Bioscience Use definitions, grouped into three major groups of Bioscience activities: Light Bioscience, Medium Bioscience and Core Bioscience. These definitions should be used in amendments to the Planning Code to incorporate bioscience uses therein.
- **Recommendation:** Two overlay zones should be established to allow bioscience uses in the city's industrial "PDR" areas. The Task Force developed a Zoning Controls matrix for each of these overlay zones and a corresponding Overlay Zones Map showing the geography of these two use areas in the context of the city's currently proposed PDR districts for the eastern neighborhoods (included in this report).

In general, the overlay zones are contrasted by a relatively "constrained" area immediately proximate to Mission Bay and Hunters Point Shipyard, which are designated as the city's hubs for development of the bioscience industry, and a more "expansive" area farther from these key nodes and in some cases deeper into well-established large-scale PDR activity areas. (See the accompanying map). It is important to note that the Task Force expects that the Planning Dept and the Redevelopment Agency would refine the boundaries and the proposed zoning controls for these overlay areas based on precise analysis of land uses and other parcel characteristics.

The zoning controls, which dictate entitlement requirements and development flexibility, are structured to essentially be the inverse of the geographic limits of each overlay zone. The most "flexible" zoning controls are associated with the constrained overlay area while a set of more "restrained" zoning controls is paired with the expansive overlay area. These are conceived of as distinct overlay zones that build outwards in sequence. In other words, Zone 2 is warranted only if Zone 1 is instituted.

Several options of zoning controls for the Bioscience use classifications noted above were developed reflecting the different policy perspectives after extensive and balanced discussion by the committee and the Task Force as a whole. As shown in the Zoning Controls matrix that follows, three options were developed: Option 1 ("Permissive"), Option 2 ("Moderate"), and Option 3 ("Restrained"). All options include use controls for Light, Medium and Core Bioscience (i.e., whether or not such uses are permitted and if so, to what extent), maximum use sizes, minimum separation from residential districts (for BSL 3 labs only), and maximum use percentages for offices used for data analysis (computational and bioinformatics) that are not integrated with lab uses and for administrative/support offices.

These types of controls are analogous to the use size limits and separation requirements extant for other types of uses in other zoning districts in San Francisco, as well as the accessory use provisions of the Planning Code. It was considered necessary to regulate Bioscience uses with these types of controls in order to ensure that Bioscience development is compatible with the mix of commercial, industrial and residential uses in the geographic

areas covered by the overlay zones, as well as to mitigate displacement pressure from bioscience office development on existing businesses and competition with other potential emerging industries. As can be seen, the options differ in nuances of details rather than as radically different approaches.

*It is important to note that the Task Force proposes below that, for NC and C districts, office-based bioscience uses (described above as office uses for data analysis, e.g. computational and bioinformatics, that are not integrated with lab uses) be incorporated into the appropriate Planning Code definitions for offices, and therefore be permitted as offices in those zoning districts. This would allow office-based bioscience to be permitted in downtown and neighborhood commercial zoning districts, subject to the same controls that apply to other types of office uses. Therefore, such office-based bioscience uses could locate outside the bioscience overlay zones as principal uses without restrictions on percentage of total floor area devoted to office use. As office uses, these office-based bioscience uses would be treated as office space as defined in Section 320 of the Planning Code, and thus be subject to the Annual Limit on Office Development (see reference below).*

Option 1, “Permissive”, incorporates into Overlay Zone 1 controls which are designed to allow the industry’s needs to determine the types of uses, concentrations, and to some degree the sizes of these uses, and limited requirements for conditional use authorization. In Overlay Zone 2, this option is more prescriptive about the sizes and composition of uses permitted, and requires conditional use authorization for some of the same uses that are permitted as of right in Zone 1. This option offers more flexibility for companies to locate in the geographic areas covered by the two zones, to grow at those locations and to change the mix of uses in the space they occupy. On the other hand, it limits the ability of the City to mitigate the displacement pressure of growing bioscience companies on existing and new businesses.

Option 3, “Restrained”, the most conservative approach relative to the other two options, applies lower maximum use sizes and the lowest maximum percentages for offices not integrated with labs and administrative offices. This option offers the least flexibility to bioscience businesses to grow and change, arguably to a degree that may be impractical. On the other hand, it provides the City with greater control over the growth and use mix of bioscience companies in the bioscience overlay zone areas.

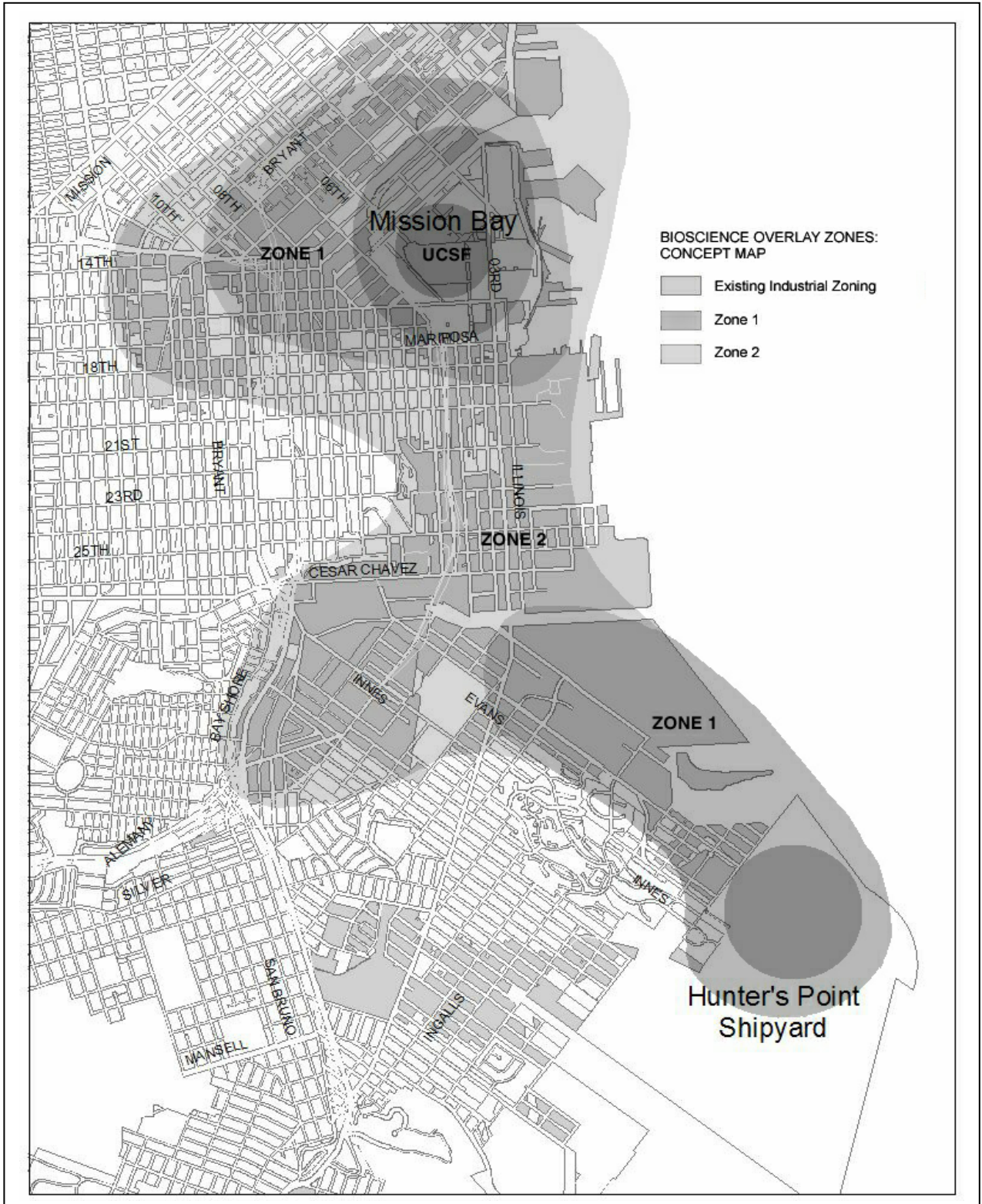
**A majority of the Task Force recommends Option 2, “Moderate” as the preferred option in regulating Bioscience uses in these overlay zone areas.** The preferred option was favored because it best addresses and balances the range of concerns and issues raised by Task Force members. Specifically, in Zone 1, Light Bioscience uses are principally permitted (or as of right) with a maximum use size of 60,000 square feet, allowing for 100% offices in uses up to 10,000 square feet and 50% offices in uses between 10,000 and 60,000 square feet. The 60,000 square feet limit recognizes that for larger businesses it is common to have in a single facility two typical research “neighborhoods” in bioscience research and development, each requiring roughly 30,000 square feet of floor area.



Like in Option 1, Medium Bioscience uses are principally permitted, and Core Bioscience uses are principally permitted in PDR districts and conditionally permitted in Buffer/Light PDR and South of Market Service Light Industrial (SLI) districts. Unlike Option 1, however, Medium Bioscience has a maximum use size of 60,000 square feet with or without conditional use authorization; this cap on these uses' size moderates the growth of these types of activities (i.e. pilot manufacturing and pharmaceutical processing kilo labs) vis-à-vis other businesses and industries in the overlay zone areas. Offices for computational science and bioinformatics uses can occupy up to 50% of the floor area occupied by Medium and Core Bioscience, while administrative offices can occupy up to 25% of the floor area. These allowances for offices are consistent with the Planning Department's current proposed policy for accessory uses in PDR uses (50% of floor area of the PDR use), and current Planning Code provisions for accessory uses in general (25% of floor area of the principal use).

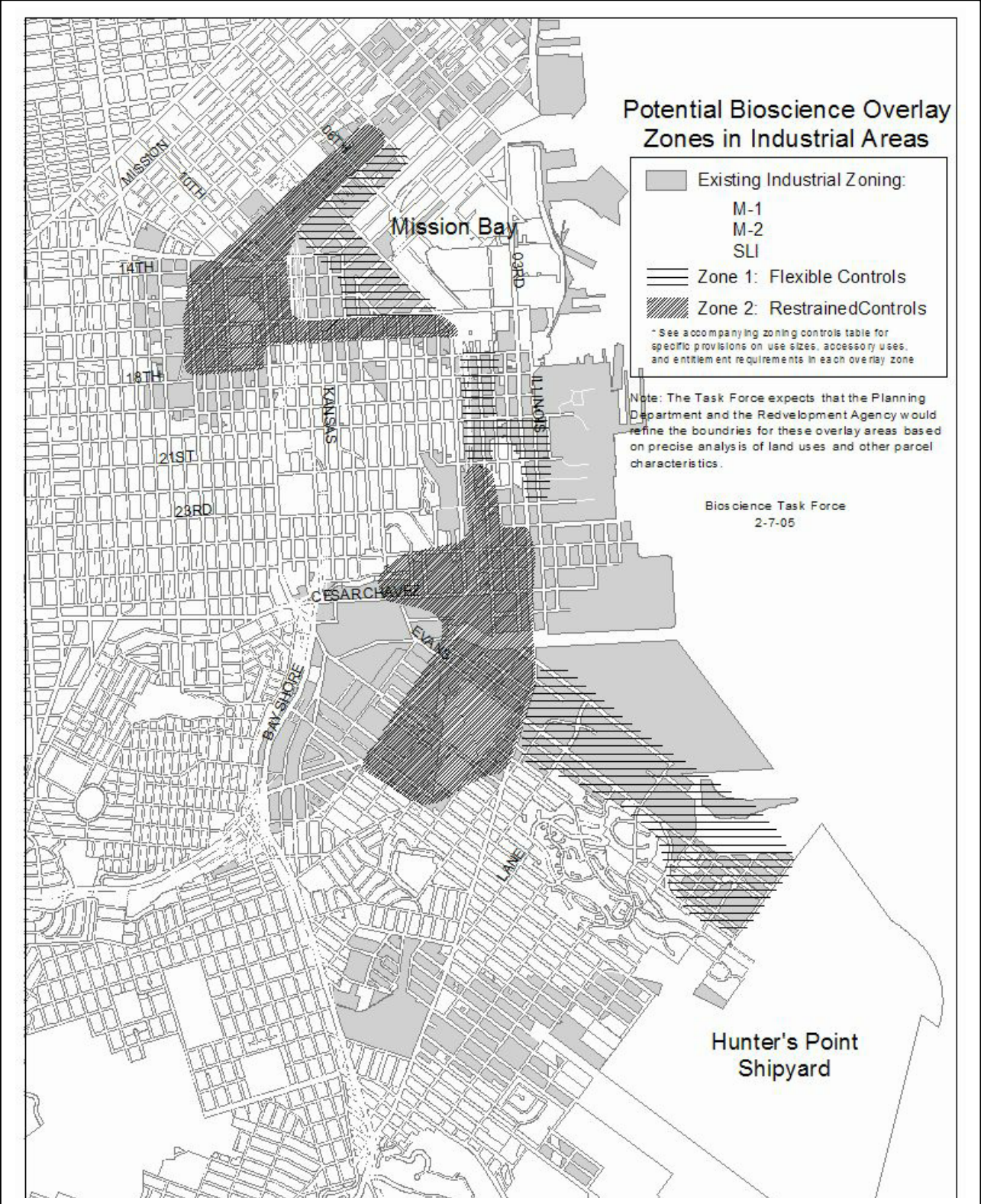
The goal in recommending these two potential overlay zones and a range of zoning controls options is to give policy makers a choice of practical possibilities that recognize the mixed use nature of the bioscience industry with a coordinated set of corresponding regulatory guidelines. The task force intends to leave finalization of policy making to the elected officials and precise regulatory language to the Planning Department.

# BIOSCIENCE OVERLAY ZONES - CONCEPT MAP





**POTENTIAL BIOSCIENCE OVERLAY ZONES IN INDUSTRIAL AREAS**



**POTENTIAL BIOSCIENCE USE CLASSIFICATION AND ZONING CONTROLS**

Bioscience Overlay Zone 1 -- Constrained Area										
		Underlying zoning districts in Zone 1								
	Use Classification (in Planning Code)	PDR district	Buffer/Light PDR district	SLI district	Maximum use size w/o CU	Maximum use size with CU	Min. separation from Residential district for BSL3 labs	Max. Non-lab Comp Science Office (incl. Admin space)	Max. Admin office space	
<b>Bioscience Uses</b>										
<b>Option 1 (permissive)</b>										
Light mixed-use Bioscience	Mixed Bio R&D Light*	P	P*	P	60,000sf	no limit	50'	100%	25%	
Medium mixed-use Bioscience	Mixed Bio R&D Med*	P	P	P	60,000sf	no limit	50'	50%*	25%	
Core mixed-use Bioscience	Mixed Bio R&D Core*	P	C*	C	60,000sf	60,000sf	50'	50%*	25%	
<b>Option 2 (moderate)</b>										
Light mixed-use Bioscience	Mixed Bio R&D Light*	P	P	P	10,000sf	na	50'	100%	25%	
		P	P	P	60,000sf	na	50'	50%	25%	
Medium mixed-use Bioscience	Mixed Bio R&D Med*	P	P	P	60,000sf	na	50'	50%	25%	
Core mixed-use Bioscience	Mixed Bio R&D Core*	P	C	C	60,000sf	60,000sf	50'	50%	25%	
<b>Option 3 (restrained)</b>										
Light mixed-use Bioscience	Mixed Bio R&D Light*	P	P	P	10,000sf	na	50'	100%	25%	
		P	P	P	40,000sf	na	50'	25%	25%	
Medium mixed-use Bioscience	Mixed Bio R&D Med*	P	P	P	40,000sf	na	50'	25%	25%	
Core mixed-use Bioscience	Mixed Bio R&D Core*	P	C	C	40,000sf	40,000sf	50'	25%	25%	
			*P = principally permitted use permitted			*C = conditionally permitted				

Bioscience Overlay Zone 2 -- Expansive Area										
		Underlying zoning districts in Zone 2								
	Use Classification (in Planning Code)	PDR district	Buffer/ Light PDR district	SLI district	Maximum use size w/o CU	Maximum use size with CU	Min. separation from Residential district for BSL3 labs	Max. Non-lab Comp Science Office (incl. Admin space)	Max. Admin office space	
<b>Bioscience Uses</b>										
<b>Option 1 (permissive)</b>										
Light mixed-use Bioscience	Mixed Bio R&D Light	P	P	P	5,000sf	na	50'	100%	25%	
		P	P	P	7,500sf	na	50'	60%	25%	
		C	C	C	na	30,000sf	50'	60%	25%	
Medium mixed-use Bioscience	Mixed Bio R&D Med	P	P	C	60,000sf	60,000sf	50'	50%*	25%	
Core mixed-use Bioscience	Mixed Bio R&D Core	P	C	NP	60,000sf	60,000sf	50'	50%*	25%	
<b>Option 2 (moderate)</b>										
Light mixed-use Bioscience	Mixed Bio R&D Light	P	P	P	5,000sf	na	50'	100%	25%	
		C	C	C	na	20,000sf	50'	40%	25%	
Medium mixed-use Bioscience	Mixed Bio R&D Med	P	P	C	60,000sf	60,000sf	50'	40%	25%	
Core mixed-use Bioscience	Mixed Bio R&D Core	P	C	NP	60,000sf	60,000sf	50'	40%	25%	
<b>Option 3 (restrained)</b>										
Light mixed-use Bioscience	Mixed Bio R&D Light	P	P	P	2,500sf	na	50'	100%	25%	
		C	C	C	na	15,000sf	50'	25%	25%	
Medium mixed-use Bioscience	Mixed Bio R&D Med	P	P	C	40,000sf	40,000sf	50'	25%	25%	
Core mixed-use Bioscience	Mixed Bio R&D Core	P	C	NP	40,000sf	40,000sf	50'	25%	25%	
								*Consistent with proposed Planning Dept provision for PDR 'accessory uses'		

PDR Districts (outside Overlay zones)								
	Use Classification (in Planning Code)	PDR district	Buffer/ Light PDR district	Min. separation from Residential district for BSL3 labs	Max. Accessory Uses* (incl. Admin space)	Max. Admin office space		
<b>Bioscience Uses</b>								
<b>Manufacturing</b>								
Biotech Pilot Mfg	Medium PDR	P	P	50'	50%	25%		
Biotech Mfg	Core PDR	P	C	50'	50%	25%		
Pharmaceutical Pilot Mfg	Medium PDR	P	P	50'	50%	25%		
Pharmaceutical Mfg	Core PDR	P	C	50'	50%	25%		
<b>Warehousing/Distribution</b>								
Warehouse	Core PDR	P	P	50'	50%	25%		
Cold Storage	Medium PDR	P	P	50'	50%	25%		
Freezer Storage	Medium PDR	P	P	50'	50%	25%		
					*Consistent with proposed Planning Dept provision for PDR 'accessory uses'			
<b>NC and C Districts</b>								
	Use Classification (in Planning Code)	NC districts	C districts	Max. Accessory lab				
<b>Bioscience Uses</b>								
<b>Research Offices</b>								
Bioinformatics	Office	C	P	40%				
Data Center	Office	C	P	40%				
Imaging (MRI)	Office	C	P	40%				
<b>Vendors</b>	Biomed Sales	C	C	40%				

- **Recommendation:** Light bioscience mixed uses should be defined to include research office space, which is co-located with research and development laboratories where basic or applied research is conducted. Such research offices would be subject to the same zoning regulations as research and development laboratories, rather than be treated as office space as defined in Section 320 of the Planning Code.
- **Recommendation:** Light bioscience mixed uses should be defined to include research office space that is co-located with research and development laboratories where basic or applied research is conducted. Such research offices would be subject to the same zoning regulations as research and development laboratories, rather than be treated as office space as defined in Section 320 of the Planning Code. Consequently, if such bioscience research office space does not fall into the office space definition it can be argued that it should not be subject to the Annual Limit on Office Development, as set forth in Sections 321 through 324 of the Planning Code. However, the Zoning Administrator would make final determination of the application of the Annual Limit. Computational science/bioinformatics offices and administrative office components of a bioscience mixed use facility would still be subject to provisions of the Annual Limit (irrespective of the allowable use and square footage provisions in the Zoning Controls Matrix).
- **Recommendation:** All mixed bioscience uses, as defined in this report, with lab and research office uses, should be subject to the jobs/housing linkage fees under 313.1(42) of the Planning Code consistent with its current application to bioscience as a “research and development” use under the standing 1988 Zoning Administrator interpretation. The Planning Department should make Section 313.1 (42) consistent with the 1988 Zoning Administrators Bulletin [Section 226 (d), 226 (e) and 226 (f)]. See Appendix IX for the text of the 1988 Zoning Administrators Bulletin.
- **Recommendation:** Allow a maximum of 25% of the floor area of any mixed bioscience use to be allocated for administrative activities. Because bioscience companies evolve and tend to change focus and operations as they mature, the treatment of administrative office as a percentage of the total area is a major consideration. The Planning Department is proposing a provision that would allow a maximum of 50% administrative and/or non-lab computational science office accessory uses in PDR uses.
- **Recommendation:** BSL 3 operations should require a buffer zone of 50 feet from adjacent residential districts.
- **Recommendation:** BSL 4 facilities should not be allowed in San Francisco.
- **Recommendation:** Manufacturing and warehousing activities of the bioscience industry should be incorporated into the definitions for medium and core PDR in the existing PDR

districts, as appropriate. The zoning controls matrix also suggests provision for certain bioscience uses in areas outside the two overlay zones.

- **Recommendation:** NC and C Districts should include office-related bioscience activities - such as bioinformatics, imaging and data centers, and vendors- into the appropriate Planning Code definitions applicable to these zoning districts.
- **Recommendation:** The existing zoning categories of M-1 and M-2 or their equivalent, which allow for industrial use, should be reserved so that emerging R&D technologies, including medium and core bioscience facilities, may be accommodated in San Francisco.
- **Recommendation:** Some of the Port of San Francisco's Central Waterfront properties are ideally located near the UCSF Mission Bay campus and the potential bioscience overlay zones. As the Port evaluates possible new uses for its property not designated for maritime purposes, the Task Force encourages the Port to explore appropriate land use designations for bioscience or emerging R&D technology companies. In view of the restrictions of the Burton Act and the Bay Conservation and Development Commission's (BCDC) policies and regulations, the best opportunity may be constructive reuse of buildings that are listed in the National Register of Historic Places, bulkhead and connector buildings, or use as an incidental part of a larger development project of Public Trust uses within the Port's "Mixed Use Opportunity Areas".
- **Recommendation:** There are several large corporation yards (e.g., MUNI, PG&E, DPW) that may provide joint air rights development for bioscience and R&D projects. Rezoning in the area should preserve a flexible opportunity for long-term joint air rights development of these sites as well as ensuring that these industrial uses are not encroached upon by incompatible uses.
- **Recommendation:** The 3rd Street Corridor and the India Basin Industrial Park are viewed by the Task Force as potentially linking Mission Bay's bioscience core with the potential for development of R&D in the Hunters Point Shipyard. If and when the industry takes root in and around Mission Bay, this corridor could provide a natural extension that supports the clustering characteristic of the industry and links it with the Hunters Point Shipyard. It could also serve to contain growth of the life science industry, thereby protecting other industrial land for traditional industrial uses.
- **Recommendation:** As circumstances related to environmental clean up and land use become clearer, a task force should be constituted specifically focused on the unique issues related to bioscience activity in Bay View Hunters Point. The industrial sites in the area are potentially attractive to biotechnology, pharmaceutical and device manufacturing operations and could be a significant workforce development opportunity.



## **II. ENVIRONMENTAL HEALTH AND SAFETY REGULATION**

While the bioscience industry is heavily regulated at the federal and state level, enforcement of many of these regulations for the health and safety of workers and neighbors falls on San Francisco agencies, including the Department of Public Health (SFDPH), the Building Department (DBI) and the Fire Department (SFFD). Larger, well-established companies normally have Environmental Health and Safety (EH&S) staff, but the "incubator" and small start-up companies may rely on consultants to develop policies, procedures and programs, and external regulators to enforce safety procedures. As part of a comprehensive approach to ensuring environmental health and safety, San Francisco should require all bioscience companies in San Francisco with BSL1, BSL2 or BSL3 research or production facilities to:

- **Recommendation:** Register with the city as a bioscience facility, and create and submit to SFDPH a BioSafety Management Plan (consolidating submissions already required by various Federal, state or other agencies). BioSafety plans will exist either as stand-alone documents based on existing federal, state or local requirements, or may be integrated within other required environmental or occupational safety plans. SFDPH will review the plan and inspect the facility to ensure that the plan is implemented and documents are updated as needed. Appendix VIII contains the elements of a proposed BioSafety Management Plan. This should be referred back to SFDPH and other agencies as necessary for review and implementation. Each Company's Plan should be updated at least annually, or more frequently if necessary as company operations change.
- **Recommendation:** Designate a Safety Officer as required by CAL OSHA to be the primary contact between the company and City Agencies responsible for enforcement of health and safety.
- **Recommendation:** Create a Biosafety Committee that reports annually to the CEO. The Committee should be composed of at least three people, with one member from the community (completely unaffiliated with the bioscience industry) and one member from SF Department of Public Health or a certified EH&S consulting firm. This Committee would meet at least once a year and inspect facility and programs (not specific projects), prepare a report to the CEO that includes minority views, and provide a copy of the report to SFDPH and the San Francisco Biosciences Committee (described below).
- **Recommendation:** Compile and submit to SFDPH as a package the documents that are already required by other regulatory bodies, as outlined below:
  - Business Owner/Operator Identification Page
  - Facility Map
  - Chemical Inventory
  - Hazardous Materials Management Plan and Inventory Statement
  - Employee Training Plan
  - Emergency Response Plan

- Medical Waste Management Plan
- **Recommendation:** Require that all bioscience companies/institutions doing business in San Francisco pay a reasonable fee to cover the direct cost of inspection and enforcement to support Health Department staff monitoring compliance with the Environmental Health and Safety plans. Without a specific fee it would be difficult for the City to allocate adequate enforcement resources. Enforcement of EH&S procedures would also protect the companies from adversarial public relations and community misinformation.
- **Recommendation:** Use the completed Bioscience Use and Potential Impacts Matrix (Appendix VIII) as a reference guide to the regulatory environment of the bioscience industry.

### **III. ECONOMIC DEVELOPMENT AND EMPLOYMENT AND TRAINING**

- **Recommendation:** The Mayor's Office of Economic Development should create a Bioscience Economic Development Team ("BEDT") with existing staff that is focused on issues and advocating policy to attract and retain bioscience companies in San Francisco. A priority of the BEDT should be to update the DBI "Bioscience Process Guide & Facility Checklist" and "What you should know about the Permit Process for a Bioscience Business" and expand it to include land use and zoning regulations for Research and Development operations.

There should also be a comprehensive guide that incorporates information about the Department of Public Health Regulation of commercial biotechnology land uses in San Francisco, the bioscience payroll credit, employment and training links, and community outreach proposals. The BEDT should act as an ombudsman, providing all necessary information to a company planning to locate in San Francisco.

- **Recommendation:** San Francisco's economic development efforts should prioritize retention of small, start-up bioscience companies evolving out of UCSF and other local research facilities; recruitment of bioscience companies that offer a wide range of employment opportunities to the City's diverse residents; and provide information to decision makers to update the City's Economic Development Plan.
- **Recommendation:** The Controller's office should consider including questions relating to the bioscience industry in its periodic public opinion surveys to assess benefits and impacts to the community.
- **Recommendation:** The City's Workforce Development System should identify bioscience as a priority sector for public and private development. The Workforce Investment Board should track private sector investments in the City's various bioscience-related education and training programs and seek to leverage these resources with grant funding.

- **Recommendation:** In order to meet growing labor market needs throughout the region, San Francisco’s educational institutions should explore creating or expanding programs related to quality assurance, clinical trials and regulatory affairs. The feasibility of creating pre-certificate programs for these fields should be explored by the Community College and community-based education and training institutes.
- **Recommendation:** Adult basic and remedial education programs should be strengthened to help more community residents gain the basic skills necessary to enter pre-certificate education and training programs.

#### **IV. COMMUNITY CONCERNS**

In order to ensure that concerned citizens are adequately informed about the safety of the bioscience industry in San Francisco, coordination among various agencies having jurisdiction over the industry, and between the City and its residents, is essential.

- **Recommendation:** The City should create a permanently empowered and appropriately staffed San Francisco Biosciences Committee (“BSC”). All relevant City departments [Health, Fire, Building, Planning, and a representative of the Bioscience Economic Development Team (BEDT)] should send a senior representative to regular meetings of this Committee at a regularly scheduled time and place.

The BSC would provide regulatory oversight of the bioscience industry in San Francisco, and identify and recommend changes in city planning codes and Redevelopment Plans that reflect community and industry concerns. As a complement to the documentation created for the Department of Public Health, the BSC would oversee the compilation or include by reference in a written or online document all relevant Federal, State and City regulations for bioscience uses (e.g. building, fire safety, hazmat, etc.) and ensure that the documents are properly completed and that the City keeps its regulatory framework up to date with changes in Federal or State regulations. Completion of the Bioscience Uses and Potential Impacts Matrix (Appendix VIII), and its review by a broad and educated audience should be a priority.

Each credible company/institution identified by the BEDT that is considering relocating to San Francisco would be assigned an ombudsman, with this relationship remaining after the company/institution moves to San Francisco. The BEDT/BSC ombudsman would interact with the CEO of small companies or a senior level executive for larger companies.

- **Recommendation:** The City should create a Bioscience Citizens Advisory Committee (the “BCAC”) to the Board of Supervisors (with staff support), which will review information gathered by the BEDT, the BSC and the Workforce Development Program, and provide, if necessary, public recommendations to the Board of Supervisors. This will ensure a

transparent process for reviewing location and supervision of bioscience research and development operations in San Francisco, and advise policy makers concerning changes in public policies impacting the life science industry. The chairperson of the BCAC would be an ex-officio member of the BSC. Specific appointments to the BCAC should reflect a broad range of stakeholders and community concerns.

- **Recommendation:** The City should coordinate with UCSF and bioscience companies to provide public information programs on the industry, to facilitate open house programs and to encourage youth outreach and internship programs for community colleges and high schools, in order to strengthen community relations, demystify the industry and educate and highlight jobs and skills.
- **Recommendation:** Public officials, civic leaders and the philanthropic community should support UCSF in acquiring the resources necessary to manage a large-scale On-the-Job Training Program that provides work experience to low-income residents.
- **Recommendation:** The City should expand its program of helping low-income community residents expunge prior criminal records (including multiple convictions) so that more residents are able to pass the background check necessary for employment in the bioscience industry.

## **V. CITYWIDE APPLICATION**

While the Land Use and Zoning recommendations are specific to certain areas of San Francisco, the Recommendations made under the Environmental Health and Safety (EH&S), Community Concerns and Economic Development/Training and Employment sections should apply to bioscience companies (including non-profit research institutions such as UCSF and the Gladstone Institute) citywide, including Redevelopment Areas.

Whether or not the Planning Commission and the Board of Supervisors decide to accept the land use and zoning recommendations of the Task Force, the other recommendations should be implemented to provide a coherent and transparent policy to accommodate and control this new industry.

## **BIOSCIENCE TASK FORCE**

### **MEMBERS AND AFFILIATION**

<b><u>SEAT NO.</u></b>	<b><u>NAME</u></b>	<b><u>AFFILIATION</u></b>
1	Madison L. Kilpatrick III	Financial Advisor - Morgan Stanley
2	Scott Williams, AIA	Design & function of biotechnology spaces
3	L. Michael Costa MPP	Health Policy business development biotech & pharmaceutical research
4	Dick Morten	SPUR Board of Directors, former VP Economic and Public Affairs, San Francisco Chamber of Commerce.
5	Lori Yamauchi	Assistant Vice Chancellor, UCSF Campus Planning
6	Scott Ogus (inactive)	Union Representative, UCSF
7	Reed M. Benet (resigned)	Commercial Real Estate Broker
8	Theresa J. Feeley	Executive Director, SF Works
9	My Do	(Mission District) Policy Analyst, Mission Economic Development Association
9	Joe Raguso	(SOMA) former VP, Strategic Partnerships, SRI International
10	Dr. Mike Le, D.C. (inactive)	(Potrero/Dogpatch) Golden Gate Business Association
11	Karen G. Pierce	(Bayview/Hunters Point) Community Activist - Environmental Health and Justice, Economic Development
14	Janice L. Bolaffi	(Western Addition Neighborhood Association - President), Founding scientist at Genteric, Director, Scientific Data Management
15	Peter Cohen	(Hayes Valley Neighborhood Association), Urban Land Use Planner and Geographer
16	Corinne W. Woods	(Mission Bay) Neighborhood Activist: Land Use, Planning, Environment
17	Gregory L. Stewart, Sr. (inactive)	Lieutenant, S.F.F.D. Hazardous Materials Specialist

## **EX-OFFICIO MEMBERS AND SUPPORT STAFF**

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Department of Administrative Services:	Jill Lerner
Department of Building Inspection:	Frank Chiu
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Department of the Environment:	Chris Geiger
Department of Public Health:	Dr. Rajiv Bhatia, Sue Cone
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## **OTHER CONTRIBUTORS**

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Land Use and Zoning ("Ad Hoc")	Lori Yamauchi, Joe Raguso, Scott Williams, Michael Costa Peter Cohen, Sue Exline
Location Factors:	Michael Costa, Dick Morten, Scott Williams, Peter Cohen, Joe Raguso, Jan Bolaffi
Functional Definition of Bioscience:	Scott Williams, Joe Raguso, Michael Costa, Jan Bolaffi
Editorial Committee:	Corinne Woods, Dick Morten, Jill Lerner, Karen Pierce

**APPENDIX I**

**Resolution 217-03 Creating Bioscience Task Force**

FILE NO. 021999 RESOLUTION NO. 217-03

[Biosciences Task Force.]

**Resolution establishing a Biosciences Task Force to make policy recommendations to the Board of Supervisors and setting forth the membership and duties of the Task Force.**

WHEREAS, Research and development land uses, including bioscience industries are relatively new industries that are expected to grow in the Bay Area because of the presence of university-based research facilities, such as at the University of California, and a prevalence of research and development land uses and the availability of substantial venture capital; and

WHEREAS, Bioscience industries have several components including laboratory research, academic and technology-based research, development and manufacturing of medicines and medical devices, and supplying of goods, machinery, instruments and other products for bioscience firms; and

WHEREAS, Bioscience industries have a range of facility design needs that include industrial, laboratory, laboratory-support and office uses; and

WHEREAS, The City's land use categories as set forth in the San Francisco Planning Code use traditional industrial classifications which are not expressly tailored to address newer industries such as the biosciences that are based on science, knowledge and information technologies; and

WHEREAS, Over the last several years, the City has approved redevelopment plans in the Mission Bay South Redevelopment Plan Area and the Hunters Point Shipyard Redevelopment Area that create land use classifications for research and development industries and identify with specificity the kinds of research and development activities permitted in those areas; and

WHEREAS, The Redevelopment Agency is undertaking a public process to develop amendments to the Hunters Point Redevelopment Plan and that planning process is

Supervisor Maxwell, Supervisor Duffy, Supervisor Ammiano, Supervisor Newsom  
**BOARD OF SUPERVISORS**

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San Francisco Department of Public Works  
Subject: Resolution 217-03 Creating Bioscience Task Force

1 evaluating areas within the Hunters Point Redevelopment Plan Area that would be desirable  
2 locations for bioscience uses; and

3 WHEREAS, The City Planning Department, with the support of the Board of  
4 Supervisors is currently engaged in a community planning process in the City's Eastern  
5 Neighborhoods, including the Mission, South of Market, Showplace Square/Potrero Hill, South  
6 Bayshore and Visitacion Valley; and

7 WHEREAS, The Eastern Neighborhoods contain all of the City's industrially zoned land  
8 and recent rapid economic growth followed by rapid decline has resulted in tremendous  
9 change in these areas and intense land use conflicts; and

10 WHEREAS, The community planning process is examining the need for and space  
11 requirements of production, distribution and repair industries, as well as housing needs and  
12 appropriate locations for mix-use development; and

13 WHEREAS, The community planning process will help inform and shape permanent  
14 zoning controls in the Eastern Neighborhoods; and

15 WHEREAS, The community planning process in the Eastern Neighborhoods would  
16 benefit from a study of the land use needs of bioscience industries and land use controls  
17 appropriate for these industries; and

18 WHEREAS, Given the varied components of biosciences, there may be areas of the  
19 City, in addition to those that have traditionally housed industrial uses, where some  
20 components of bioscience industries might be appropriate land uses and might provide local  
21 job opportunities, now, therefore, be it

22 RESOLVED, That the Board of Supervisors of the City and County of San Francisco  
23 hereby establishes a task force which shall be known as the San Francisco Biosciences Task  
24 Force; and, be it

25

Supervisor Maxwell, Supervisor Duffy  
BOARD OF SUPERVISORS

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1           FURTHER RESOLVED, That the Task Force shall consist of the following ~~20-21-22~~  
2 members of which ~~14-15~~ 16 shall be voting members appointed by and serving at the  
3 pleasure of the Board:

- 4         • one (1) from a business association;
- 5         • one (1) member with expertise in the bioscience industry;
- 6         • one (1) member from a bioscience company;
- 7         • one (1) from an urban planning association;
- 8         • one (1) from an educational institution with expertise in the biosciences and the  
9 bioscience industry;
- 10        • one (1) from an organized labor entity that represents employees of bioscience  
11 companies or research institutions;
- 12        • one (1) from a private real estate firm that represents companies seeking  
13 bioscience space in the Bay Area;
- 14        • one (1) from an organization that specializes in job training and placement;
- 15        • five (5) from neighborhood organizations with one (1) each from the Mission; South  
16 of Market, Potrero Hill/Dogpatch, Bayview Hunters Point and Visitacion Valley/Little  
17 Hollywood neighborhoods;
- 18        • ~~two (2)~~ three (3) from neighborhood organizations within the City and County of San  
19 Francisco and outside of the neighborhoods listed above;
- 20        • one (1) member to include the director of the Department of City Planning or his/her  
21 appointed representative who shall not be a voting member of the Task Force;
- 22        • one (1) member to include the director of the Department of Public Health or his/her  
23 appointed representative who shall not be a voting member of the Task Force;

24  
25







City and County of San Francisco

City Hall  
1 Dr. Carlton B. Goodlett Place  
San Francisco, CA 94102-4689

Tails  
Resolution

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**File Number:** 021999

**Date Passed:**

Resolution establishing a Biosciences Task Force to make policy recommendations to the Board of Supervisors and setting forth the membership and duties of the Task Force.

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April 8, 2003 Board of Supervisors — AMENDED

Ayes: 11 - Ammiano, Daly, Dufty, Gonzalez, Hall, Ma, Maxwell, McGoldrick, Newsom, Peskin, Sandoval

April 8, 2003 Board of Supervisors — ADOPTED AS AMENDED

Ayes: 11 - Ammiano, Daly, Dufty, Gonzalez, Hall, Ma, Maxwell, McGoldrick, Newsom, Peskin, Sandoval

File No. 021999

I hereby certify that the foregoing Resolution was ADOPTED AS AMENDED on April 8, 2003 by the Board of Supervisors of the City and County of San Francisco.

APR 18 2003

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Date Approved



Gloria L. Young  
Clerk of the Board



Mayor Willie L. Brown Jr.

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File No. 021999

City and County of San Francisco  
Tails Report

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Printed at 1:12 PM on 4/9/03

**APPENDIX II BENEFITS OF BIOSCIENCES INDUSTRY FOR SAN FRANCISCO AND ITS WORKFORCE**

**The Case for Biosciences: Our Best Option for Economic Development**

Two years ago, the San Francisco Center for Economic Development commissioned a study with the Stanford Research Institute to determine what key economic sectors, or industry clusters, drive the San Francisco economy. The study compared these sectors to the national economy as a whole.

Below is a table from this study, indicating the top six overall industry clusters as identified by the North American Industry Classification Scheme (NAICS) codes for San Francisco:

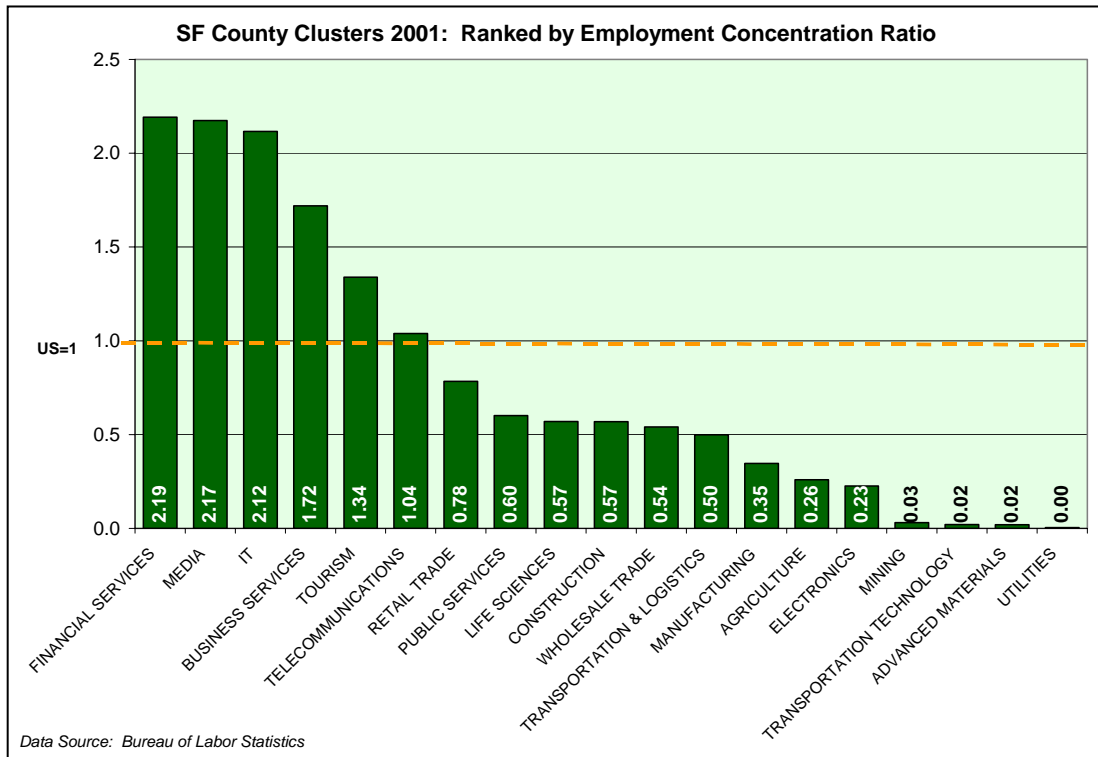
<i>San Francisco's Top Industry Clusters</i>			
<i>Overall Industry Cluster</i>	<b>Employment Concentration Ratio</b>	<b>Key Industry Cluster Segments</b>	<b>Employment Concentration Ratios</b>
<i>Financial Services</i>	2.19	<ul style="list-style-type: none"> <li>• Securities</li> <li>• Financial Institutions</li> <li>• Insurance</li> </ul>	5.95 1.63 1.24
<i>Media Services</i>	2.17	<ul style="list-style-type: none"> <li>• Internet Publishing/Broadcasting</li> <li>• Marketing/Advertising</li> <li>• Broadcasting</li> <li>• Motion Picture &amp; Sound Recording</li> </ul>	11.68 2.91 2.41 1.55
<i>Information Technology</i>	1.72	<ul style="list-style-type: none"> <li>• ISP</li> <li>• Software</li> <li>• Hardware and Networking</li> </ul>	7.44 2.44 1.28
<i>Business Services</i>	1.72	<ul style="list-style-type: none"> <li>• Consulting &amp; Professional Services</li> <li>• R&amp;D Services</li> <li>• Management &amp; Administrative Services</li> </ul>	3.48 1.39 1.33
<i>Tourism</i>	1.34	<ul style="list-style-type: none"> <li>• Travel Services</li> <li>• Arts, Entertainment &amp; Recreation</li> <li>• Accommodations &amp; Food Services</li> </ul>	2.55 1.46 1.32
<i>Telecommunications</i>	1.04	<ul style="list-style-type: none"> <li>• Wired Telecom Services</li> </ul>	1.26

The above-mentioned sectors all have “employment concentration ratios” exceeding the national average numbers of 1.0. In other words, these are the sectors in which San Francisco does better, over time, than other sectors. Economists will also tell you that these are sectors in which the city might most readily expect further growth and an increase in jobs.

On the following page is a graph that indicates the concentration ratios for a variety of other industries and sectors in San Francisco.

Retail services have an employment concentration ratio of 0.75; manufacturing has an employment concentration ratio of 0.35; the life sciences sector has an employment concentration ratio of 0.57, and so on.

What is the implication of these employment concentration numbers? It is straightforward: San Francisco does not have many choices when it comes to economic development and growth in new industries. Our manufacturing base, what little is left of it, has been moving out of town. Clerical and back office jobs are being moved out of town or, in some cases, out of the country. In fact, what growth has occurred in the years since the “dot com” bust has been concentrated in a limited range of industries that are entirely predictable and what we would expect – i.e. in the sectors with already high employment concentration ratios.



### **Biosciences: A Unique Opportunity**

Bioscience offers a unique opportunity to pursue sectoral growth in an area where San Francisco's employment concentration appears low.

Why? The simple answer is the University of California, San Francisco (UCSF). The premier biomedical campus on the West Coast with the highest level of NIH funding of any institution in California, UCSF has been a significant generator of biosciences jobs. The largest biosciences firm in the Bay Area, Genentech, actually spun out of UCSF, and a significant share of the 85,000 jobs in biosciences in the Bay Area can trace their progeny more or less directly to UCSF.

In other words, in an industry that many other jurisdictions around the nation are falling all over themselves to promote, San Francisco in some senses already has a natural lead.

Furthermore, though San Francisco's economy technically does have a low employment concentration ratio in life sciences, because UCSF is a state institution its jobs are not counted in the life sciences numbers.

Additionally, and perhaps most importantly, the growth that is expected in the bioscience field – in the Bay Area over the next decade life science jobs are expected to roughly double to 150-200,000 jobs. This growth will happen all around us in the Bay Area. If San Francisco works hard and continues to build up possibilities for Mission Bay and



beyond, it can absorb several thousand of these jobs, including ones that can be open to workers in some of our current training programs at CCSF, SFWorks, or YCD.

But why not pursue other sectors in which San Francisco has a low concentration ratio? These other sectors are not areas where we already have made significant investment as we have with UCSF. More importantly, though, these sectors show no promise for delivering the jobs and growth we need. It is not only San Francisco's manufacturing base that has been in a state of decline for many years. This is also the case for the nation as a whole. And San Francisco is notoriously too high priced to attract such cost-sensitive jobs.

### **APPENDIX III**      **Bioscience Employment & Training Opportunities**

Life sciences executives believe the availability of a skilled workforce to be among the most important factors contributing to business success.<sup>4</sup> Proximity to the region's prestigious education and research institutions and their faculty and graduates is considered to be a key reason for the high concentration of bioscience companies in the Bay Area. As the industry evolves from research and development to commercialization, the region can anticipate increased demand for research and production technicians as well as for non-scientists. San Francisco boasts a well-educated populace. This, combined with the availability of a wide-range of bioscience-related education and training opportunities, suggests that San Francisco is well-positioned to meet the labor demands of the bioscience industry.

Biotechnology companies are a hybrid of science and business. Individuals with skills and experience in either area can make a career in the biotechnology industry.<sup>5</sup> Careers in the bioscience industry include opportunities in research, clinical trials, product development, regulatory compliance, manufacturing, quality assurance/quality control, sales and marketing, engineering, technical support, information services, finance, administration, public relations, administrative support functions, and management. The workforce needs of a company are dictated by the stage it is at in its development. Young, early-stage companies doing biotechnology research require a few highly educated, skilled employees with scientific backgrounds. As a company moves into FDA trials and product development and ultimately manufacturing, the company's workforce requirements begin to expand. Research and development staffs may remain the same, but become a smaller percentage of the total number of employees in a company. The number of non-scientific staff including administrative personnel, production assistants, and marketing personnel increases as a biotech company begins to focus on product development.<sup>6</sup>

#### **Education**

Without knowing the characteristics of the companies that will eventually locate within San Francisco, it is difficult to predict their workforce needs and impact on the San Francisco economy. Nonetheless, it is possible to use the industry nationally and here in the Bay Area as a reference point.

The skill and education levels of those employed in the bioscience industry vary, and opportunities are available for people with a range of backgrounds. Nationally, seven percent of bioscience employee have just a high school education; seven percent possess

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<sup>4</sup> Bay Area Life Sciences Clusters of Innovation Quantitative Survey, 2002 in *Taking Action for Tomorrow: Bay Area Life Sciences Strategic Action Plan*.

<sup>5</sup> *A Critical Analysis of the Local Biotechnology Industry in Alameda, Contra Costa, & Solano Counties* prepared by Tapan Munroe, Gary Craft and David Hutton, June 27, 2002, p. 56

<sup>6</sup> *Ibid*, p.47.

a degree from a community college; fifty percent possess a bachelor's degree and thirty-six percent have a graduate degree.<sup>7</sup> Though not an exact match, these percentages compare favorably to the demographics of San Francisco's adult residents. Eighty-one percent completed high school; forty-five percent have at least a bachelor's degree and more than sixteen percent have a graduate or professional degree.<sup>8</sup>

The most common method for getting a job in the biotechnology industry is to acquire a technical background in the life sciences with good laboratory experience. The most common degree credential for entry into the industry is a bachelor's degree in a relevant science or technology. Nonetheless, entry-level positions in service, technician and support positions often require only a high school diploma or AA/AS degree. Studies of the biotechnology industry across the nation, however, find companies to prefer AA/AS degrees to high school diplomas. According to Dr. Stephen Dahms, Chair of the Biotechnology Industry Organization Workforce Committee, it is now commonly accepted that technicians are trained by a community college and not a four-year college or university. This is because such training programs focus on practical technical skills that are in demand in research labs and production facilities.<sup>9</sup> These technical skills are very important for individuals trying to secure jobs within the industry. Entry-level positions for someone with an AA/AS degree include media prep technicians, lab technicians, and manufacturing technicians. Many of these entry-level jobs can serve as stepping-stones to more senior positions,<sup>10</sup> though most local companies require that managers possess a four year degree.<sup>11</sup>

For individuals lacking a Ph.D., advancement opportunities are most limited within research and development where senior scientist positions usually require a Ph.D. It is possible, but very rare, that someone with just a bachelors or masters degree will have "equivalent experience" to a Ph.D.<sup>12</sup> The best opportunity for someone without an advanced degree in the biological sciences to advance their career is outside of the research and development field, where it is quite common for someone without a Ph.D. to be managers, group leaders, or vice president of operations. Many of the larger, more established biotech companies have two separate career paths, one for science and the other for business and management.<sup>13</sup>

Given its dependence upon the latest research and cutting edge technology, the bioscience industry places a high value on on-going education and life-long learning.

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<sup>7</sup> A. Stephen Dahms, Executive Director CSU Biotechnology Program, "Connecting Higher Education to Biotechnology Business Development," Presentation to the San Francisco Chamber of Commerce, June 2004.

<sup>8</sup> US Census, 2002

<sup>9</sup> San Diego's Biosciences Industry Cluster, A Regional Employment Study, prepared by San Diego State University, August 2000.

<sup>10</sup> *A Critical Analysis of the Local Biotechnology Industry in Alameda, Contra Costa, & Solano Counties* prepared by Tapan Munroe, Gary Craft and David Hutton, June 27, 2002, p. 56.

<sup>11</sup> *Ibid*, p. 57.

<sup>12</sup> *Ibid*, p. 56.

<sup>13</sup> *Ibid*, p. 56.

Employers will often provide tuition reimbursement for employees completing undergraduate or masters degrees or taking specialized training. They also often invest in specialized, in-house training courses to keep employees up to date.

### **Experience**

Bioscience companies have a strong preference for hiring individuals with previous work experience. Small companies often lack the resources to manage formal training and employee development programs. Companies prefer candidates with industry experience, even entry-level experience, over new degree holders or transfers from another industry.<sup>14</sup> This too bodes well for San Francisco. Even though the City is not currently home to many bioscience companies, many of its residents are, nonetheless, already employed in the industry. UCSF is one of the largest bioscience employers in the region. In addition, a significant number of San Francisco residents work within the industry, but do so elsewhere in the region. Approximately, fifty percent of the bioscience employees in South San Francisco live in San Francisco.<sup>15</sup>

### **Wages**

Jobs with local biotechnology companies are typically well-paying positions. Starting salaries for entry-level jobs vary widely with the type of job, the level of education and the individual's job experience. Entry-level technical positions with local biotechnology companies typically are in the \$30,000 - \$40,000/year range. With additional education and experience, salary levels increase. The median salary for lab technicians is \$35,000. Service and support positions, such as glass washer or stock room clerk are generally lower, in the \$24,000 to \$32,000 range. Clerical and administration positions range from \$28,000 to \$50,000. Salary levels for research scientists are generally in the \$68,000 to \$85,000 range.<sup>16</sup>

### **Relevant Education and Training Programs in San Francisco**

#### ***Bachelor's and Graduate Level***

- **University of California San Francisco**

UCSF is a health sciences campus and offers graduate degrees in the biological, biomedical, pharmaceutical, nursing, social and behavioral sciences. One of the world's leading biomedical research institutions, UCSF has secured more than \$292 million in federal funding from the National Institutes of Health. These research grants are a key source of funding for early stage basic research. UCSF's recent expansion to Mission Bay has doubled the research space available at UCSF.

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<sup>14</sup> *Bioscience in Silicon Valley*, by Mary Alice Yund, PhD, produced by the NOVA Private Industry Council, 2000, p. 39-40.

<sup>15</sup> San Francisco Center for Economic Development, 2003.

<sup>16</sup> *A Critical Analysis of the Local Biotechnology Industry in Alameda, Contra Costa, & Solano Counties* prepared by Tapan Munroe, Gary Craft and David Hutton, June 27, 2002, p. 56.

- **San Francisco State**

Part of the California State University system, San Francisco State University offers Bachelor's and Master's level programs in Biochemistry, Cell & Molecular Biology, and Microbiology that have applications in biotechnology. A Certificate in Biotechnology is available to Biology and Biochemistry majors that complete the required sequence of courses. In addition, the Department of Biology offers a graduate level Certificate in Genetic Engineering, with lecture and laboratory course work that emphasizes recombinant DNA methodology.

SFSU participates in CSUPERB, the California State University Program for Education and Research in Biotechnology. Through CSUPERB, SFSU students can access distance-learning courses and programs offered by other universities in the CSU system. These include: a Masters of Science or Advanced Certificate programs in both Biomedical Quality Systems and Regulatory Affairs.

### *Continuing Education*

- **University of California, Berkeley Extension**

UC Berkeley Extension is the continuing education branch of the University of California, Berkeley. Its more than 2,000 courses and 30 certificate programs are offered at various locations throughout the Bay Area, including several in San Francisco.

Currently, three biotechnology-related sequences are offered:

- ⇒ *Bioinformatics Essentials* – designed for individuals from a range of scientific disciplines, it provides an introduction to the fundamental scientific and computational concepts, methods, and tools central to the field of bioinformatics.
- ⇒ *Bioinformatics: Quantitative and Computational Methods* – provides computer professionals with an introduction to and understanding of bioinformatics.
- ⇒ *Biotechnology Business and Marketing* – designed to help professionals from a variety of disciplines rapidly develop the knowledge and skills necessary to understand and work effectively in the bioscience industry.

- **San Francisco State University's College of Extended Learning**

SF State's College of Extended Learning offers a Certificate program in Clinical Trials Design and Management. Most individuals who pursue the Certificate are working professionals with a degree in science, medicine, nursing or other technologies.

### *Community College*

- **City College of San Francisco**

City College of San Francisco is among the oldest and largest community colleges, enrolling over 106,000 diverse students each year and offering more than 4,700 courses

at its main campus, 11 neighborhood campuses, and more than 150 other instructional sites citywide. Over one third of CCSF students hail from underrepresented minority populations, particularly African American, Filipino, and Latino/Hispanic.

City College offers certificate programs in both biomanufacturing and biotechnology. The Biomanufacturing track prepares the student for a job in the biotech industry as a BioProcess Technician, Media Prep technician, etc. The Biotech track focuses on more applied research techniques and is for those interested in transferring to a 4-year university. The length of time necessary to complete the certificate programs varies dependent upon the number of units taken per semester and whether students already have a degree. (Originally, 80% of students already had at least a BA/BS degree). For full-time students, the Biomanufacturing Certificate is designed to be completed within one year while the Biotech certificate takes 2 years. Nonetheless, the coursework in both programs is offered primarily on evenings and weekends in order to address the needs of working students.

### ***Vocational & Pre-Certificate Programs***

- **City College of San Francisco's Bridge to Biotech Program**

In spring of 2003, City College began offering the "Bridge-to-Biotech" Program at its Bayview and Mission District campuses as a one-semester precursor to its acclaimed certificate programs. The goal of the Bridge Program is to increase the representation of minorities in CCSF's biotech certificate programs. The one-semester program consists of 15 hours of class per week:

- Biology 72B (college credit)
- Biotech Math (noncredit)
- Biotech English (noncredit)

A 9<sup>th</sup> grade skill level in math and English is required for entry into the Bridge Program. Approximately 40 students enroll in the Bridge each semester and 85% are retained. To date, 90% of Bridge Program graduates have enrolled in City College's certificate program.

- **SFWorks' On-Ramp to Biotech Program**

Since 2002, SFWorks, a workforce development intermediary organization affiliated with the Chamber of Commerce, has coordinated the On-Ramp to Biotech Training Program. Offered in the Bayview at City College's Southeast Campus, the On-Ramp is a pre-cursor to City College's Bridge to Biotech Program. On-Ramp students become a subset of Bridge students and receive additional professional development supports and a paid laboratory internship.

Eligibility for the On-Ramp is based on:

- having a high school diploma or GED
- scoring at a skill level between the 6<sup>th</sup> and 9<sup>th</sup> grade in math and English on the TABE exam;
- demonstrating financial hardship

- completing a multi-day assessment and interviews

In addition, because of employer screens, the On-Ramp requires that participants be able to pass a drug test and have no felony drug offenses. Ninety percent of the students that have enrolled in the On-Ramp to date have been African-American or Latino. The vast majority reside in Bayview, Visitacion Valley, Potrero or the Outer Mission. At the time of enrollment over fifty percent of students were receiving public assistance.

The On-Ramp phase precedes the start of a CCSF semester by 10 weeks. The On-Ramp consists of 3 integrated class components:

- Introduction to Life Sciences and Lab Methodology
- Contextualized Mathematics
- Professional Development

In addition, students participate in weekly one-on-one meetings with professional development coaches. After 8 weeks, students have completed a resume specific to the biotech industry and are enrolled in City College's Bridge to Biotech program. During the Bridge semester, On-Ramp students continue to receive professional development coaching and are placed in subsidized laboratory internships, usually at UCSF or at the US Department of Agriculture's facility in Albany.

At the conclusion of the Bridge semester, SFWorks supports students in transitioning into permanent jobs within the biosciences industry. With their new laboratory and academic experience, participants are qualified for the following jobs:

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| ▪ Laboratory Assistant                | ▪ Pharmaceutical Manufacturing Tech   |
| ▪ Pharmaceutical Materials Specialist | ▪ Animal Care Technician              |
| ▪ Media Prep                          | ▪ Bioprocess Manufacturing Technician |
| ▪ Glass Washer                        | ▪ Clinical Trials Assistant           |

These full-time positions have starting salaries of approximately \$25,000 plus benefits. In addition, they offer opportunities for ongoing career and wage growth. Most area biotech companies offer tuition reimbursement plans as part of their benefits package, making it financially feasible for program graduates to continue their education.

The On-Ramp has demonstrated success at helping low-income and low-skilled individuals access entry-level employment and on-going education in the growing bioscience industry. Within six months of graduation, seventy-five percent of On-Ramp graduates are working in bioscience jobs, the majority earning \$11 - \$17/hour. In addition, almost seventy percent of On-Ramp graduates have enrolled in on-going post-secondary education

The On-Ramp currently serves just 12-15 students per semester. To date, thirty-three individuals have graduated, indicating successful completion of both their academic coursework and internship. An additional twelve students are currently enrolled. With recent grants from the National Science Foundation and the Bay Area Workforce Funders

Collaborative, in June 2005, the On-Ramp will expand to City College' Mission campus and double in size. The On-Ramp was founded with philanthropic funds. It currently is funded through a combination of philanthropic and public funding. Per student costs exceed \$10,000.

- **UCSF/YCD's Community Employment in the Bioscience Industry Program**

Located in the economically distressed Southeast sector of the city, the new Mission Bay facility offers UCSF the opportunity of increasing its community employment numbers, with a focus on Bayview Hunters Point and Visitacion Valley. In order to meet its community employment goal, UCSF partnered with Young Community Developers (YCD), a community-based organization in the Bayview, to create the Community Employment in the Bioscience Industry (CEBI) program.

YCD conducts recruitment and screening activities with potential program participants. Pre-training at YDC familiarizes participants with the industry, introduces them to the skills and competencies necessary for successful employment outcomes, and provides basic math, English, and science skills in a didactic classroom setting.

Participants then transition into the hands-on training component at UCSF where participants spend their six-month internships working full-time as technicians in Animal Care, Cell Culture and Environmental Health and Safety.

As funding for the CEBI program is from UCSF and a private foundation, the program has to date operated on a small scale. In its first year, four students entered internships at UCSF. Three were hired by UCSF at the conclusion of their internships. In Year 2, four individuals entered internships. Three are expected to complete in December 2004.

### High School Programs

In San Francisco, several high schools have secured basic bioscience supplies (often through corporate donations) and incorporate biotech experiments into their science curriculum. According to BioLink, the National Center for Bioscience Education, the strongest high school biotech program in San Francisco and perhaps the entire United States is at Lincoln High School where the instructor boasts years of industry experience. In addition, John O'Connell High School currently has a bioscience pathway. Through a partnership with City College of San Francisco, there are initial plans for the pathway to evolve into a middle college.

### **Recommendations**

- Economic development activities should prioritize firms and segments of the industry that offer employment to the greatest range of residents.
- In order to meet growing labor market needs throughout the region, San Francisco's educational institutions should explore creating or expanding programs related quality assurance, clinical trials and regulatory affairs. The feasibility of creating pre-



certificate programs for these fields should be explored by the Community College and community-based education and training institutes.

- The City's Workforce Investment Board should track private-sector investments in the City's various bioscience-related education and training programs (in-kind and direct) and seek to leverage these resources by going after federal grants requiring matching contributions.
- An investment should be made in helping low-income community residents expunge prior criminal offenses so that more residents are able to pass the background check necessary for employment in the bioscience industry.
- Adult basic and remedial education programs should be strengthened to help more community residents gain the basic skills necessary to enter pre-certificate education and training programs.
- Vocational ESL programs should be developed to help immigrant residents with strong math skills gain the English proficiency necessary to secure additional bioscience training or succeed in industry employment
- Public officials, civic leaders and the philanthropic community should support UCSF in acquiring the resources necessary to manage a large-scale On-the-Job Training Program that provides work experience to low-income residents.

## **APPENDIX IV Bioscience Taskforce Community Perspective Sub-committee “Biotech, how?”**

The community perspective subcommittee of the Bioscience Task Force framed its task as answering the question “Biotech, how?” We think it is important for the Task Force to consider the biotech industry in the context of overall economic development objectives of San Francisco.

Many believe supporting the location of the bioscience industry in San Francisco is a win-win situation for San Francisco and the bioscience industry. Partially consistent with this perspective, polling has indicated that a strong majority of city residents support the presence of bioscience in San Francisco so long as it is regulated to insure the health and safety of the community. However, increasing the presence of bioscience industry in San Francisco may have other effects on our neighborhoods and communities, both positive and negative. We believe consideration about economic development policy decisions should be given to multiple goals simultaneously: a sustainable diverse economy that meets neighborhood needs, meaningful well-paying jobs for all city residents, and environmental health. The perspective here is not to fuel a debate for and against bioscience but rather create a dialogue on how best to develop these industries.

Whether the economic impacts on San Francisco residents and neighborhoods is positive or negative will depend on a number of factors not directly under the control of the industry, such as the skills base of residents and the availability of land for industrial uses. For example, growth in the number of biotech employers could be synergistic with neighborhood economic development goals. However, in the context of limited land for commercial and industrial uses, biotech industries may affect the value of land and rents - potentially leading to displacement of other businesses and industries. Biotech may provide good employment opportunities for San Francisco residents. However, this requires that residents have the knowledge and skills needed to avail themselves of these opportunities. San Francisco already boasts biotechnology training programs for residents with diverse educational and skill levels. These programs are available through educational and community-based institutions and are located in communities most likely to be impacted by the growth of the bioscience industry.

We believe it is critical to ensure that these and other direct and indirect impacts be considered and balanced in the City’s approach to locating and encouraging the Biotech Industry. The table below highlights two types of issues—those that are specific to bioscience and those related to any emerging industry. We believe it is important to distinguish between these two categories of issues. We believe all industries in San Francisco should be held to the same high standard for community impacts.

Bioscience Specific	General Economic Development
<ul style="list-style-type: none"> <li>• Human / Social impacts-- social value and social risk of biotech industry</li> <li>• Ethics (e.g., stem cell research, human genetic engineering, animal testing,)</li> <li>• Environmental Hazards</li> <li>• Jobs-skills match between industry and residents</li> <li>• Consistency with neighborhood planning goals / vision</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental impacts due to job growth</li> <li>• Impacts on existing businesses</li> <li>• Impacts on competing emerging industries</li> <li>• Impacts on tax base</li> <li>• Impacts on local and regional housing needs</li> </ul>

We believe it is also critical to understand these impacts through meaningful public dialogue. Polling also indicated that gaps in support for the industry’s presence correlated with gaps in residents’ knowledge about the industry. San Francisco residents need accurate information with which to judge both economic and environmental impacts and the opportunity to have their opinions counted in the policy process. Only limited community outreach has occurred in this regard so far. The recent Biotech World Café also illustrated a large number of knowledge gaps about the pros and cons of the bioscience industry.

Furthermore, the bioscience task force process overlaps with ongoing neighborhood planning processes. While staff from the Department of City Planning have participated in the Task Force, the city should ensure that proposals for locating bioscience industries also be compatible with community planning visions developed in the context of DCP’s citywide action plan and the SF Redevelopment Agencies Project Area planning.

At this point, the Task force has addressed the issues of industry related physical hazards in a direct way but has not had substantial discussion or debate about many of the economic and social impacts illustrated in the table. This limitation needs to be specifically acknowledged.

While addressing some of the additional issues requires investments of time and process, the addition of existing information could support a balanced and holistic perspective. For example, there are certain communities in Boston that are not having good biotech experiences - specifically in terms of safety and jobs. San Francisco’s effort to develop a thriving biotech sector, supported by city residents, could benefit from an analysis of their experience. Also, experience with other emerging industries and recent boom—bust cycles in San Francisco (e.g. Dot.com) provides important lessons for the city with regards to preventing traffic, noise, parking, gentrification, business displacement and other adverse impacts. Decision makers can draw from these experiences in exploring

ways to mitigate these adverse impacts in the course of the development of biotech industries.

We believe the potential community impacts and the limited community dialogue on these issues should be, at the very least acknowledged by the Task Force. This committee has identified a number of community concerns regarding potential negative consequences of bioscience businesses being encouraged into areas of the city outside of Mission Bay and Hunters Point Shipyard. We acknowledge that much of this concern is based more on the *unknowns* about the real implications of this industry than they are based on actual experience or evidence. However, if one was to take an intentionally cautionary perspective that affords the greatest assurances that the industry will have a “socially responsible” impact in the communities where businesses will be locating, the following are potential mechanisms that could be considered to mitigate some of these community concerns:

### **Community Perspectives Recommendations**

#### **Recommendation 1:**

Require certain bioscience companies with research or production facilities to register with the city as a bioscience facility, to create facility bio-safety plans with certain required elements established by SFDPH, to provide bio-safety plans to SFDPH electronically, to provide updates to SFDPH electronically where changes in operations warrant. Bio-safety plans will exist either as stand alone documents or may be integrated within other required environmental or occupational safety plans. SFDPH will review the plan and inspect the facility to ensure functional plans every three years.

#### **Recommendation 2:**

Require bioscience companies to provide an annual disclosure with the following

1. A listing research and production processes;
2. A list of anticipated or achieved products
3. A list of anticipated or potential product applications;
4. Sources of funding
5. other?

#### **Recommendation 3:**

Create the San Francisco Bioscience Peer Advisory Board comprised of five members. One member would represent each of the following disciplines: member of the bioscience industry, expert in ethics / bioethics, expert in public health, expert in environmental science, and expert in social science. The members of this board will:

- Review bioscience company annual disclosures
- When requested, review public concerns about the adequacy of facility bio-safety plans

- When requested, provide analysis and guidance to city leaders on issues related to community concerns or ethics.

**Recommendation 4:**

Establish an open house day. A simple procedure can be established that provides guidance to new bioscience companies in San Francisco to open their doors for a local community day. A very powerful way to strengthen community relations and demystify biotech, as well as educate and highlight jobs/skills.

**Recommendation 5:**

Conduct periodic surveys of residents local to bioscience development to assess benefits and impacts to the community.

**Recommendation 6:**

Create summer intern programs. San Francisco can help devise simple procedures to aid companies in establishing summer intern programs for community colleges and high schools.

**Recommendation 7:**

Launch a big brother/big sisters program. San Francisco can help match up biosciences companies and organizations that provide mentor and role model relationship services – directly involving scientists with residents in the local community.

**Recommendation 8:**

Listed below are some potential zoning controls that could be considered to mitigate some of the community concerns mentioned previously. We are not necessarily “recommending” these controls, but rather are putting these ideas on the table as potential mechanisms that policy makers might think about as these types of community concerns are discussed in setting policies and regulations for bioscience uses.

<u>Potential concerns</u>	<u>Potential zoning controls</u>
Existing PDR businesses/Business displacement	-Bioscience uses allowed only in designated subareas/overlay zones of PDR districts -Relocation requirements for existing PDR uses if displaced by new bioscience uses -Require Conditional Use authorization for bioscience lab uses in PDR districts
Competing emerging industries/Business exclusion	-Office/research office uses not allowed in PDR districts -Establish maximum use sizes for bioscience uses
Consistency with neighborhood planning goals	-Require a consistency finding with adopted area plan for proposed bioscience uses -Require Conditional Use authorization for bioscience uses where area plan has not been adopted
Funding for neighborhood amenities/Public benefits	-Explore feasibility of applying development impact fees of area plan to new bioscience lab and office uses
Increased housing demand/Residential displacement	-Explore feasibility of Jobs-Housing linkage fees for bioscience lab and office uses

**Recommendation 9:**

- In regards to bioscience employment/training opportunities, San Francisco’s economic development efforts should prioritize:
  - Retention of small, start-up bioscience companies evolving out of UCSF and other local research facilities
  - Recruitment of mid- and large-size bioscience companies that offer a wide range of employment opportunities to San Francisco diverse residents.
- San Francisco’s Workforce Development System should identify bioscience as a priority sector for the development and implementation of bioscience education, training and employment programs. Training funds should be allocated accordingly. In addition, the public Workforce System should aggressively pursue additional funding (public and private) to support bioscience employment and training programs.
- In order to meet growing labor market needs throughout the region, San Francisco’s educational institutions should explore creating or expanding programs related to quality assurance, clinical trials and regulatory affairs. The feasibility of creating pre-certificate programs for these fields should be explored by the Community College and community-based education and training institutes.

- The City's Workforce Investment Board should track private-sector investments in the City's various bioscience-related education and training programs (in-kind and direct) and seek to leverage these resources by going after federal grants requiring matching contributions.
- An investment should be made in helping low-income community residents expunge prior criminal offenses so that more residents are able to pass the background check necessary for employment in the bioscience industry.
- Adult basic and remedial education programs should be strengthened to help more community residents gain the basic skills necessary to enter pre-certificate education and training programs.
- Vocational ESL programs should be developed to help immigrant residents with strong math skills gain the English proficiency necessary to secure additional bioscience training or succeed in industry employment
- Public officials, civic leaders and the philanthropic community should encourage and support UCSF and other nonprofit/public sector research & development sites (e.g., Gladstone, Veteran's Administration) in acquiring the resources necessary to implement a large-scale On-the-Job Training Program that provides bioscience work experience to low-income residents.

## APPENDIX V BIOSCIENCE LOCATION FACTORS

# SF Biosciences Task Force

Industry Location Committee  
Location Factors and Draft Policy  
Recommendations  
April, 2004

DRAFT 4/28/04

## Approach

- Committee mandate was defined to focus on the point of view of life science decision makers (senior mgmt/early funders) to understand what is important to them when they consider locating their firms in a particular jurisdiction.
- Data was gathered and analyzed from a multiplicity of sources, including published reports, interviews, relevant informed experience
- Resulting decision factors were identified and prioritized
- Conclusions and inferences for policy recommendations were drawn

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## Inferences from the Data...

- A review of a wide variety of research into the bioscience industry, as well as interviews with life science leaders, suggests that the presence of high quality research institutions and workforces, access to available capital, and the overall costs of doing business, are the most important factors in industry decision making concerning where to locate.
- Land use and regulatory factors are comparatively less important, yet remain “necessary but not sufficient” conditions for development of bioscience facilities.
- San Francisco's attractiveness to biotech companies under current conditions is limited given highly competitive opportunities to locate elsewhere in the Bay Area and in other regions.
- The development of UCSF/Mission Bay creates a competitive opportunity for San Francisco to attract bioscience companies through proactive public policies and programs. It will require additional strategies, however, to realize Mission Bay's full potential.
- The likelihood of both start up and mature biotech firms locating in the city would increase with strategic changes in economic development and tax policies, workforce training, targeted land use zoning, and infrastructure enhancement.

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## ... Lead to Specific Policies Facilitating Location.

- Clear land use rules, flexible definition for “bioscience uses”, and efficient planning and permitting processes
- Development and implementation of fiscal policies that are competitive with other Bay area jurisdictions
- Targeted economic development strategies and incentives
- Strong support of research mission and educational programs as UCSF, USF, SF State, and City College
- Infrastructure enhancement related to housing, transportation, and education
- Pro-active public outreach and education programs addressing the costs/benefits of bioscience, to facilitate greater understanding among political and community leaders as well as the public

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## Factors Important to Industry

- High Quality Intellectual and Human Resources
- Access to Capital
- Acceptable Costs of Business
- Facilitative Regulatory and Political Environments
- Quality of Existing Infrastructure: Transportation, Space, Housing, Cost of Living, Education

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## Intellectual/Human Resources

**82% of life science leaders surveyed by Monitor Group in 2002 thought the proximity of a highly trained workforce was the greatest factor impacting their business success.**

- SF well positioned to take advantage of breadth and depth of available scientific expertise
  - 45,000 research and biopharma employees within 1 hour commute
- Proximity of high quality professional and technical programs
  - At UCSF, USF, SF State, City College
  - 58% of life science leaders surveyed felt this was one of top factors related to business success
- Experienced technology transfer and management teams: Individuals who turn ideas into businesses
  - 25+ years of experience has generated scores of managers in the Bay area with relevant expertise
- Proximity of legal practices specializing in life science intellectual property
  - Greatest concentration exists in Bay area, many with offices in SF

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## Capital Markets

### **Life science leaders perceive access to capital as a top Bay area strength**

- Proximity to angel, seed, venture funding
  - representing 34% of active venture capital firms in U.S., raising >10% of all biopharma funding in 2002
- Availability of government funding
  - UCSF, UC Berkeley, and Stanford received \$667 million in NIH bioscience research funding in 2001
  - Of this, UCSF gained \$350 million, more than 52%
  - UCSF ranked 4<sup>th</sup> among all institutions nationwide
- Proximity of “smart” capital
  - Funders with significant life science funding experience concentrated in Bay area

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## Cost of Business

### **88% of Life Science Leaders felt the cost of doing business was the top threat going forward**

- Initial siting and start up costs
  - SF permitting and building transaction costs are higher than other Bay area locations
- Ongoing operations costs
  - Taxes and fees
    - Payroll, housing linkage and impact fees, are disincentives to location in SF compared to other Bay area localities
    - A typical early stage firm with 43 employees would pay \$52,772 in SF taxes per year, compared to \$2877 in Emeryville, or \$1275 in SSF
  - Labor costs
    - High throughout Bay Area
- Opportunity costs of alternative locations outside of Bay Area
  - Austin, LA, Singapore, Shanghai, are building financial, intellectual, and physical, capability to compete more effectively with “old” centers such as Bay Area and Boston

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## Regulatory Environment

### **Extended planning and public review processes, with the potential for continual changes and delay, negatively impact firm consideration of SF**

- Zoning that facilitates initial location and flexible growth in a timely way
  - Firm functions evolve, impacting space and use requirements. Rigid zoning is a strong negative in the location decision.
    - Example: current SOMA mixed use districts allowing light industrial uses disallow “chemical processing of materials”, precluding labs essential to many lifescience firms
- Permitting process that facilitates initial location and growth/morphing
  - Structural impediments to location and growth require amending:
    - Startups need to be able to move into space quickly, partly as a way of controlling burn rates (cash flow), and because investors who often control the firm’s board demand it. Extended permitting application, review, and decision timeframes can negatively impact firm consideration of SF
    - Permitting lab space <25% of use can also negatively impact firm consideration, given need to grow beyond that flexibly
    - Stability of zoning/permitting process over time
- Level of health, environment, and safety codes
  - Well developed local, state and federal, regulations exist
  - Office of Legislative Analyst report found no CA locality adopted more restrictive controls.
  - SF should ensure local codes remain current, with trained personnel to facilitate permitting and enforcement

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## Political Environment

### **A business-friendly political environment ranked as the 3<sup>rd</sup> most important barrier to firm expansion among life science leaders surveyed**

- David Binder focus groups (2002) found community leaders expect
  - Complete disclosure and honesty from biotech industry
  - Industry led community education programs
  - Jobs and training programs for San Franciscans
  - No displacement of community residents
  - Adequate environmental regulations
- Lifescience firms run by entrepreneurs, scientists, investors, who
  - Have little experience in politics, lobbying, or community education
  - Just want to start a business and develop product(s)
- San Francisco can help firms address community concerns through proactive outreach and educational programs

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## Infrastructure/Quality of Life

### Life science leaders perceive the quality of the transportation system as the second most important threat to their businesses

- Transportation system: Quality, Reach, Ease
  - Bay Area widely perceived as having non coordinated, inconsistent, congested, system
  - Parking, valued by mobile work force, is a potential issue in SF compared to other Bay Area
  - Within Bay Area, San Francisco has comparatively well developed network, and planned investments will enhance the network further.
  
- 2,000 to 10,000 sq ft, plus access to wet lab space, initially needed for early stage firms
  - Small, affordable, wet lab space difficult to find in Bay area
  - Access to space to morph from 15-30 person small business to 300 to 1000 employee firm more difficult in SF than other Bay Area localities
  - Mission Bay has developed larger scale buildings, suitable for more mature companies
  - Smaller space, new or rehabbed, could be developed in designated bioscience zones
  
- Housing affordability and Cost of Living
  - 73% of life science leaders surveyed indicated that the high cost of housing is one of the most significant impediments to firm expansion in the next five years
  - SF metro highest cost of living/ Oakland fifth highest in 2002
  
- Education Quality
  - Bay Area Council poll in May, 2002, indicated 85% of respondents felt that improving K-12 education was very important
  - Adjusting for cost of living, Bay Area teacher salaries among lowest in nation in 2001

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## Comparisons: SF, Bay Area

Top 10 Factors	SF	Bay Area
Work Force Access		
Research Center Proximity		
Access to Capital		
Cost of Business		
Access to NIH Funding		
Transportation System		
Housing Costs		
Regulatory Environment		
Business Friendly Political Environment		

**Legend**  
 SF compared to Bay Area:  
 Superior ■  
 Neutral □  
 Inferior ■

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## Comparison: SF, Rest Of Country/World (ROW)

Top 10 Factors	SF	ROW
Work Force Access	Superior	Neutral
Research Center Proximity	Superior	Neutral
Access to Capital	Superior	Neutral
Cost of Business	Inferior	Neutral
Access to NIH Funding	Superior	Neutral
Transportation System	Neutral	Neutral
Housing Costs	Inferior	Neutral
Regulatory Environment	Inferior	Neutral
Business Friendly Political Environment	Inferior	Neutral

Legend	
SF compared to ROC:	
Superior	Yellow
Neutral	White
Inferior	Red

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## Policies Facilitating Location in SF

- Clear land use rules, flexible definition for “bioscience uses”, and efficient planning and permitting processes
- Development and implementation of fiscal policies that are competitive with other Bay area jurisdictions
- Targeted economic development strategies and incentives
- Strong support of research mission and educational programs as UCSF, USF, SF State, and City College
- Infrastructure enhancement related to housing, transportation, and education
- Pro-active public outreach and education programs addressing the costs/benefits of bioscience, to facilitate greater understanding among community leaders and the public

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## Draft Policy Recommendations

- **Land Use, Planning and Permitting:**
  - A “Life science” land use designation should be established that allows for firms without labs (e.g. bioinformatics, clinical trial management) to locate in mixed use and commercial areas without being subject to Prop M restrictions
  - “Life Science” zones should be designated specifically for Life Science land use
  - The “one stop” review process currently in place in the Building Department should be expanded to include permitting and planning, so that development can proceed quickly and conveniently by minimizing discretionary review for projects that meet existing industry and community standards
  - A Life Science ombudsman should be established to help firms considering SF location “walk through” land use, environmental, health and safety and building code regulations, as well as support developers planning to develop/build life science facilities
- **Health and Safety:**
  - San Francisco’s health and safety regulations should be consistent with, and not extend beyond, state and federal regulations.
- **Financial Incentives:**
  - The city should consider the cost impact of developer exactions, and adopt reasonable policies to minimize city imposed costs on laboratory research and development space
  - Tax policy should be amended to support employment growth in early stage life science firms, where cost sensitivity is high. Multi year payroll tax phase in and removal of the housing linkage taxes are recommended.
- **Political Environment:**
  - A public information program should be implemented to communicate the benefits, costs, and existing safeguards, to policy makers, community leaders and the public
  - A standing advisory task force comprised of citizens, industry representatives, and specialists, should be established to advise policy makers concerning changes in public policies impacting the life science industry.

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## **APPENDIX VI**

## **LAND USE/ZONING COMMITTEE REPORT AND BIOSCIENCE USE DEFINITIONS**

Land Use/Zoning Committee report  
Bioscience Task Force  
February 10, 2005

The “ad hoc” land use/zoning committee was formed to look specifically at land use and zoning controls that could appropriately regulate the potential siting and development of bioscience uses in areas outside of Mission Bay and Hunters Point Shipyard. In particular the objective was to craft a framework for regulations that the Planning Department can consider incorporating into the rezoning of the “Eastern Neighborhoods” industrial areas. Bioscience uses are currently permitted as a primary use in M-1 and M-2 industrial zones according to a 1988 Zoning Administrator interpretation. However, bioscience uses are not defined in the definitions of “Production, Distribution, Repair” (PDR) activities, so it is so far unclear as to how bioscience will be treated vis a vis other “industrial” uses.

The design of zoning controls for bioscience required wrestling with a number of very important policy issues surrounding the current and future use of industrial areas in the eastern neighborhoods: how to avoid bioscience uses creating displacement pressure on existing uses; how to maintain existing viable industries and create opportunities for other potential emerging industries; how will bioscience growth bring job development for a wide range of the workforce; to what extent bioscience growth should be restricted to Mission Bay; the appropriate allowance for research office to mix with other uses in “industrial” areas; the appropriate scale of bioscience uses for industrial areas compared to those uses in Mission Bay.

The committee’s recommendations, including a range of zoning controls “options,” reflect the differences of opinion within the Task Force on particularly sensitive issues of use sizes and office uses in the PDR areas. The issue of use sizes relates to whether it should be assumed that Mission Bay can provide larger floor plate facilities for established companies, and that space outside Mission Bay should not be in direct competition with the Mission Bay space, or if it should be assumed that even established companies need flexibility as they grow and change, and perhaps lower cost space, and that Mission Bay may not be able to accommodate them. The issue of office uses relates to the subtle but critical functional difference between “research offices” to support “wet lab” activities, computational “dry lab” offices which might be able to locate in areas zoned for traditional office uses, and administrative office uses. This issue was resolved to some extent by careful use definitions and corresponding zoning controls, yet the reality is that bioscience businesses often wish to “cluster” all of these office functions near their primary R&D/lab operations. This “mixed” characteristic of the bioscience industry is part of the challenge in addressing these key policy issues.

Issues and recommendations coming out of other task force work—bioscience functional definition, industrial location, code processes, community perspectives, workforce development—also helped to shape this committee’s work. It is important to note here that the land use and zoning controls suggested here are an experiment and can, and perhaps should, be revisited after a period of implementation. The geography of overlay



zones and the provisions of the controls can be adjusted as appropriate. The Planning Department's PDR study currently underway will also be informative for such a followup refinement.

### **Zoning framework**

An early realization was that bioscience uses are not simply another type of industrial or PDR or research and development (R&D) category and thus should be clearly distinguished as a land use type and given their own unique set of controls. For one thing, bioscience uses defy simple definitions because businesses tend to integrate multiple activities in a single location, and the composition of activities and space arrangements tend to be dynamic over the course of fairly long research and development cycles (this is discussed in more detail in the bioscience use definitions attachment)

Given the unique characteristics of this use, the proposed zoning framework is to establish "overlay" zones for bioscience that would add to but not replace the primary underlying zoning designations in the eastern neighborhoods. "Overlay" zones, as a concept, are a zoning tool intended to provide flexibility in the application of use controls in different geographic areas, across multiple zoning use districts. This is particularly useful when, for example, bioscience uses would be permitted in some industrial zoned areas and not in others. Otherwise, if bioscience uses were simply permitted in light industrial zones, then they would be permitted in all light industrial zones, and the planning department could not treat bioscience uses in certain areas of the light industrial zones differently than in others. Also, in the Eastern Neighborhoods areas, it is still unknown as to how parcels will be specifically rezoned, so the overlay zones can still be relevant to defined areas of the current industrial zones. It should be noted, however, that if there are discrepancies between the overlay zoning controls and the underlying primary zoning use controls once they are established, then the more restrictive control would apply, unless the overlay zoning code language specified an alternative application. The final resolution of such discrepancies would be made by the Zoning Administrator.

Two bioscience overlay zones are considered. Conceptually these zones extend concentrically outward from the core bioscience node of Mission Bay and a potential future secondary bioscience node at Hunters Point Shipyard. (see attached **Overlay Zones Concept Map**). The basic geographic "universe" for these areas is the underlying M-1, M-2 and SLI zones, which are essentially the eastern neighborhoods existing industrial zoning designations. Bioscience Overlay Zone 1 is considered a "constrained area" that diagrammatically surrounds the Mission Bay area and adjacent to the Hunters Point Shipyard. Bioscience Overlay Zone 2 is a more "expansive area" that is roughly adjacent to Zone 1 extending farther out from the core Mission Bay and HPS nodes and in some cases deeper into well-established large-scale PDR activity areas.

These generalized overlay areas were then refined to create more specific boundaries (see attached **Potential Bioscience Overlay Zones Map**), considering such factors as distances and access to the two core nodes, existing building stock and parcel sizes, and adjacencies of other uses. It is important to note that the overlay zones on this map should be thought of with soft edges—the Planning Department and Redevelopment Agency, respectively, should further refine the boundaries of these overlay areas based on careful ground-truthing of land uses and other parcel characteristics.

### **Overlay Zone 1**

The areas immediately proximate to Mission Bay in southern SoMa, the eastern edge of Showplace/Lower Potrero, and northern Central Waterfront are arguably the best suited locations for any new bioscience R&D uses outside the Mission Bay core itself. These areas have a rich stock of existing medium-scale industrial buildings that are conducive to adaptive reuse for start-up and early-stage bioscience uses. The “market” for bioscience development in the city has also shown greatest interest in these areas as they reinforce the locational clustering tendency of the industry. It should be noted that the Showplace/Lower Potrero area within this zone has been considered for new housing uses, and two projects have already been approved. However, the underlying existing M-1 zoning is still in place and interim controls were recently adopted for the area pending a study of PDR by the Planning Department.

Similarly, the northern portion of the Bayview’s industrial area, centered along Evans Avenue and the upper end of the Third Street corridor, is a potential gateway location for the Hunters Point Shipyard and for the Third Street connection to Mission Bay. The parcel pattern in this Bayview area is much larger than the Zone 1 areas around Mission Bay, and the industrial building stock is typically newer single-story structures, but these might be conducive for larger-scale lab uses that are co-mingled with pilot manufacturing and warehousing/distribution operations.

Given that the advent of bioscience has raised the concern about potential displacement pressure on existing “PDR” uses, the Zone 1 area is purposely geographically constrained to minimize that kind of land use competition within the overall industrially-zoned areas of the eastern neighborhoods. It is in a sense an experimental zoning district. By the same token, given the relatively limited area of Zone 1, the associated permissive entitlement requirements and use flexibility for this overlay zone (discussed in more detail below) are structured to maximize “certainty” for property developers and businesses, as well as for nearby community residents, that bioscience uses are allowable and encouraged land uses in these constrained areas.

### **Overlay Zone 2**

There are several additional parts of the industrial “PDR” districts which could also be considered for bioscience uses to provide for as expansive a market area as possible. This includes the core of the Northeast Mission east of Harrison Street, the southern swath of SoMa, the south side of 16th Street through Lower Potrero Hill, the southern end of Central Waterfront, and a portion of the northwest Bayview peripheral to the produce district. Many of these Zone 2 areas have large parcel patterns and there are several “underutilized” soft sites. However, these are also areas of relatively robust existing industrial activity and thus somewhat vulnerable to displacement under increased competitive land market conditions. Therefore the associated zoning controls are structured to be more cautionary and prescriptive about the types of bioscience uses that are allowable.

### **Zoning controls**

The types of uses allowed in these overlay zones is the same, following the use classifications of Light, Medium and Core mixed-use Bioscience. These definitions are intentionally organized in a similar way that PDR is subdivided into categories based on different intensities of use. (See the attached **Bioscience Use Definitions** for more

specifics on types of activities under these classifications). What does differ between the Zone 1 and Zone 2 overlays are the specific controls for use sizes, office uses, and entitlement requirements that apply to bioscience uses within the two zone areas—they are structured to essentially be the inverse of the geographic limits of each overlay zone—the most flexible zoning controls are associated with the constrained overlay area while a set of more restricted zoning controls is paired with the expansive overlay area.

Generally the more flexible zoning controls for Zone 1 Overlay would accommodate a wider range of bioscience uses, and are intended to facilitate critical clustering near Mission Bay and potential future clustering in HPS. Zoning controls for Overlay Zone 2 are significantly more restrictive and thus would allow a narrower range of use types, intending to focus on accommodation for bioscience pilot manufacturing and warehousing/distribution uses and smaller, “startup” R & D uses. Given the unknown effects of potential bioscience industry growth, whether positive or otherwise, there are concerns not only about displacement pressure on existing businesses and competition with other potential emerging industries, but also about access to bioscience jobs for residents of the eastern neighborhoods and compatibility of bioscience development and uses with other community priorities which have been identified through neighborhood planning processes. Thus, for the more expansive geography of the Zone 2 areas, associated zoning controls are substantially more restrictive than for Zone 1 in order to emphasize a cautionary approach to permitting bioscience uses deep into the city’s existing established PDR activity areas.

For specific regulations within the two overlay zones, the Land Use/Zoning Committee is forwarding three potential options for bioscience zoning controls (see attached **Zoning Controls Matrix**). In each overlay zone, light, medium and core mixed-use Bioscience is either “principally permitted” or permitted as a principal use indicated with the letter P, or “conditionally permitted” or permitted as a conditional use indicated with the letter C. Further, the committee has established recommendations for maximum use sizes, minimum separation from residential districts, and maximum use percentages for research offices not integrated with lab uses and for administrative/support offices. Note that for Light mixed bioscience uses the zoning controls matrix provides more flexibility and permitting ease for smaller uses under a certain threshold size (see zoning matrix for details). In establishing maximum use size limits one consideration is the recognition of typical research “neighborhoods” in bioscience research and development, comprised of a size and composition of staff that requires roughly 30,000 square feet of floor area. For larger businesses it is common to have two research neighborhoods in a single facility.

The first option is considered “Permissive.” In the constrained areas of Overlay Zone 1, this option is designed to allow the needs of the industry to determine the uses, concentrations, and to some degree the sizes of these uses, and limited requirements for conditional use authorization. In other words, very few limits are intended in this option for Zone 1. In Overlay Zone 2, this option is in relative terms more “permissive” than the other options for Zone 2, but it is still prescriptive about the sizes and composition of uses, and in most cases requires conditional use authorization for R & D/lab uses. This includes conditional use authorization as a standard for mixed bioscience R&D uses larger than 7,500 square feet as well as an absolute maximum use size, and reduced allowances for office accessory uses consistent with the Planning Department’s current proposed policy to apply to PDR uses.

The second option is considered “Moderate.” In this option the maximum use size and percentage of office use are restricted, though there is flexible use allowance for small businesses under a certain size. Again the difference between Overlay Zone 1 and Overlay Zone 2 is primarily one of the scale of use and the entitlement requirements. The third option is considered “Restrained” and presents the most conservative approach. In this option the maximum use size and percentage of office use are further restricted, arguably to a degree that it may be impractical for many bioscience businesses.

The zoning controls matrix also suggests provisions for certain bioscience uses in areas outside these two overlay zones. For general “PDR” areas, as they are designated in the adopted rezonings, it is recommended that manufacturing and warehousing activities of the bioscience industry be incorporated into the definitions for medium and core PDR, as appropriate. Similarly, for NC and C districts, the recommendation is to include office-related bioscience activities—such as bioinformatics, imaging and data centers, and vendors—into the appropriate Planning Code definitions applicable to these zoning districts.

## **Recommendations**

The committee recommends the two potential overlay zones (attached map). A majority of committee members favored making a preferred recommendation for the **Option 2** zoning controls. An alternative opinion expressed by one of the five committee members was to leave the recommendation as a range of equally plausible options. Therefore, the committee is effectively recommending option 2 but is forwarding the full range of zoning controls options (attached matrix) to give policy makers a choice of practical possibilities that recognize the mixed-use nature of the bioscience industry with a coordinated set of corresponding regulatory guidelines. While the different implications of each option are important as they relate to broader policy issues for the eastern neighborhoods, it is important to note that the “options” offer nuances of details rather than radically alternative approaches—the overall framework for proposed bioscience zoning is consistent and has been worked out with extensive and balanced discussion by this committee and the task force as a whole. The Land Use/Zoning committee leaves the finalization of policy making to the elected officials and precise regulatory language to the Planning Department.

Further detailed recommendations from the committee are as follows:

Bioscience use classifications based on the definitions in this report should be adopted in the Planning Code to allow regulation of the industry as a specifically identified use type.

Light bioscience mixed uses should be defined to include research office which is co-located with research and development laboratories where scientific basic or applied research is conducted. Such research offices would be subject to the same zoning regulations as research and development laboratories, rather than be treated as office space as defined in Section 320 of the Planning Code. Consequently, if such bioscience research office space does not fall into the office space definition it can be argued that it should not be subject to the Annual Limit on Office Development, as set forth in Sections 321 through 324 of the Planning Code. However, the final determination of the Annual

Limit application would be made by the Zoning Administrator. Computational science/bioinformatics offices and administrative office components of a bioscience mixed use facility would still be subject to provisions of the Annual Limit (irrespective of the allowable use and square footage provisions in the zoning controls matrix).

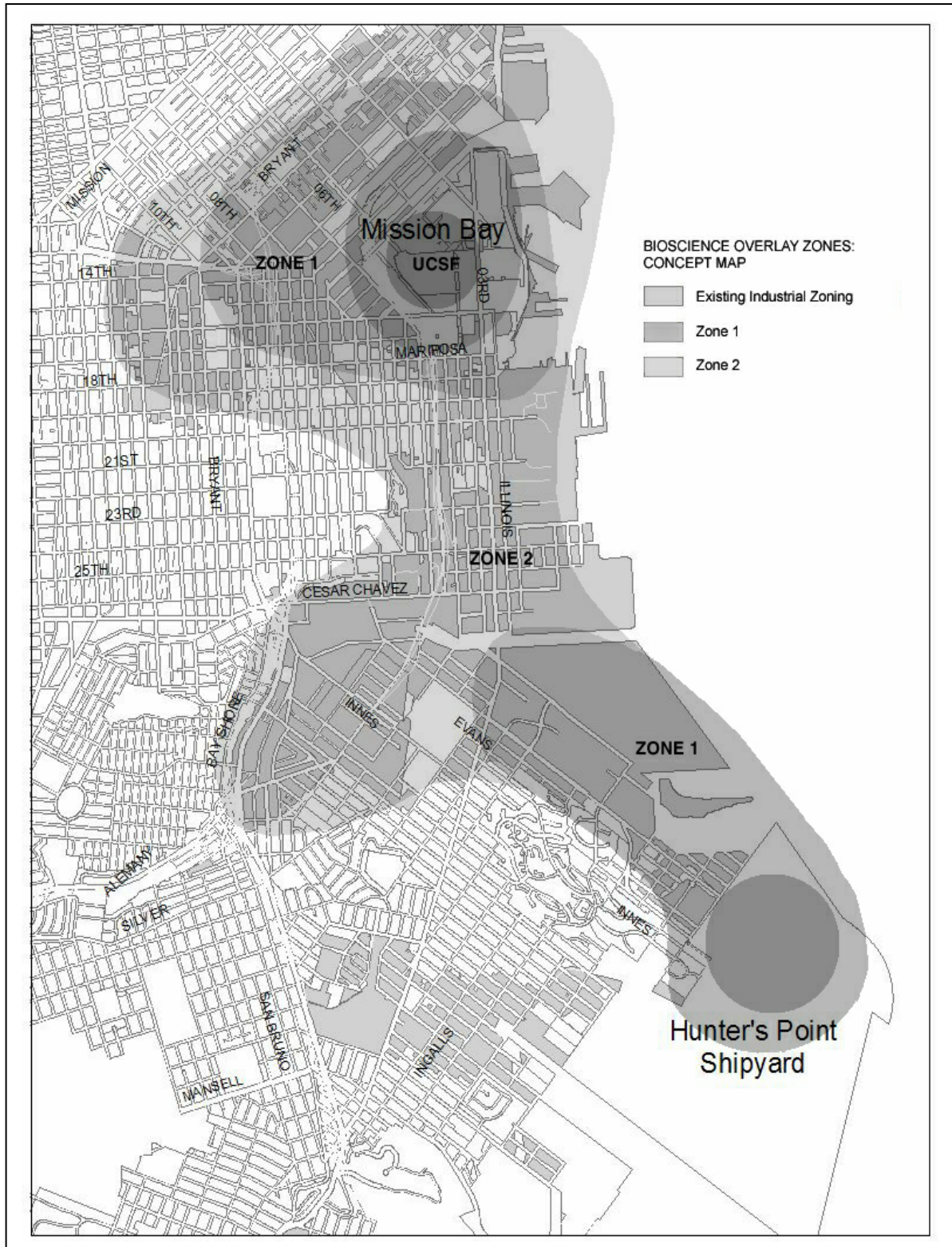
Light bioscience mixed use with lab and research office uses should continue to be subject to the jobs/housing linkage fees under 313.1(42) of the Planning Code consistent with its current application to bioscience as a “research and development” use under the standing 1988 Zoning Administrator interpretation.

Because bioscience companies evolve, and tend to change focus and operations as they mature, the treatment of administrative office as a percentage of the total area is a major consideration. The recommendation is to allow a maximum of 25% of the floor area of any mixed bioscience use to be allocated for administrative activities.

BSL 3 operations should require a buffer zone from adjacent residential districts. 50 feet is recommended.

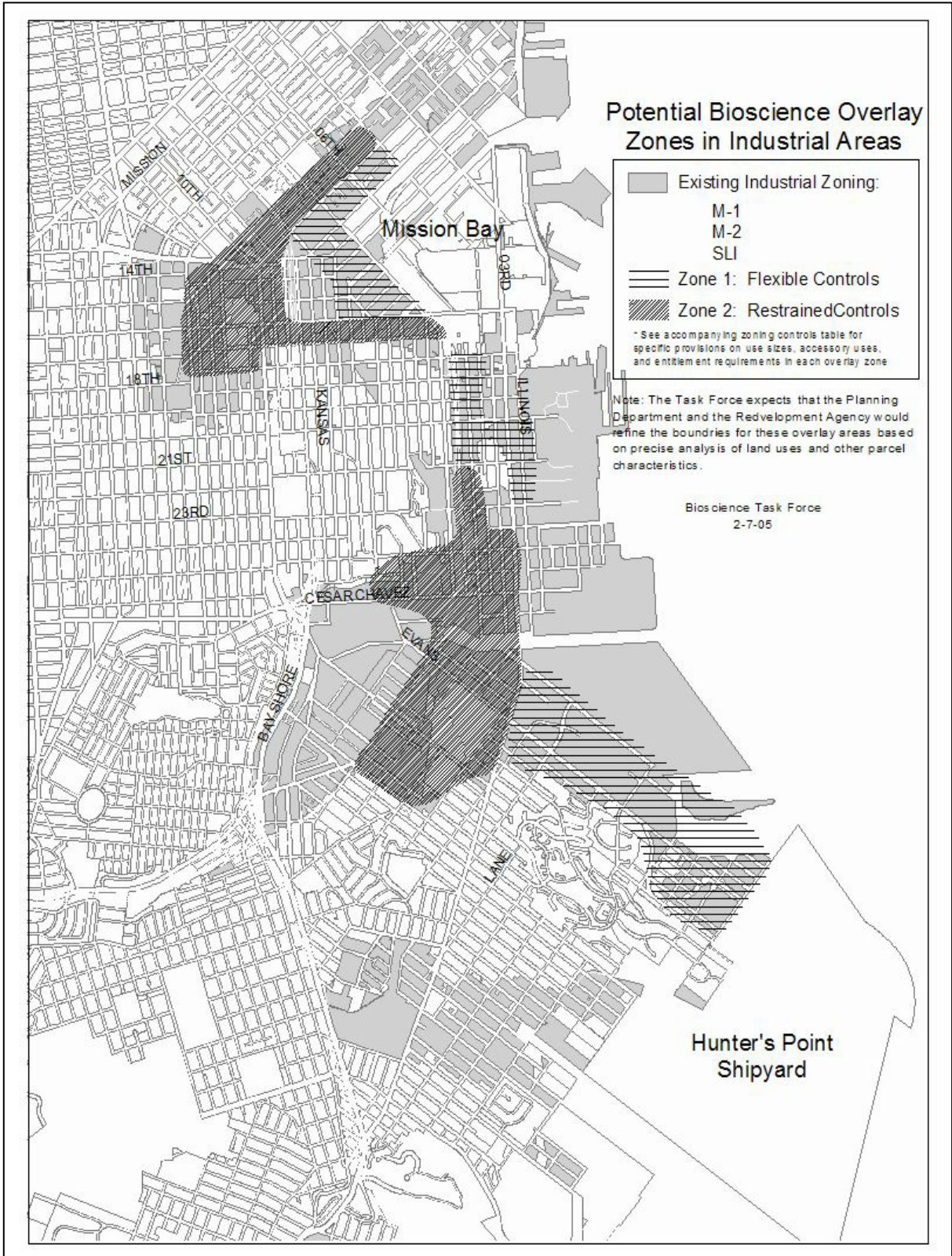
BSL 4 facilities should not be allowed in San Francisco.

# BIOSCIENCE OVERLAY ZONES CONCEPT MAP





**POTENTIAL BIOSCIENCE OVERLAY ZONES IN INDUSTRIAL AREA**



## POTENTIAL BIOSCIENCE USE CLASSIFICATIONS AND ZONING CONTROLS

Bioscience Overlay Zone 1 -- Constrained Area									
Underlying zoning districts in Zone 1									
	Use Classification (in Planning Code)	PDR district	Buffer/ Light PDR district	SLI district	Maximum use size w/o CU	Maximum use size with CU	Min. separation from Res district for BSL3 labs	Max. non-lab Comp Science Office (incl. Admin space)	Max. Admin office space
<b>Bioscience Uses</b>									
<b>Option 1 (permissive)</b>									
Light mixed-use Bioscience	Mixed Bio R&D Light*	P	P*	P	60,000sf	no limit	50'	100%	25%
Medium mixed-use Bioscience	Mixed Bio R&D Med*	P	P	P	60,000sf	no limit	50'	50%*	25%
Core mixed-use Bioscience	Mixed Bio R&D Core*	P	C*	C	60,000sf	60,000sf	50'	50%*	25%
<b>Option 2 (moderate)</b>									
Light mixed-use Bioscience	Mixed Bio R&D Light*	P	P	P	10,000sf	na	50'	100%	25%
		P	P	P	60,000sf	na	50'	50%	25%
Medium mixed-use Bioscience	Mixed Bio R&D Med*	P	P	P	60,000sf	na	50'	50%	25%
Core mixed-use Bioscience	Mixed Bio R&D Core*	P	C	C	60,000sf	60,000sf	50'	50%	25%
<b>Option 3 (restrained)</b>									
Light mixed-use Bioscience	Mixed Bio R&D Light*	P	P	P	10,000sf	na	50'	100%	25%
		P	P	P	40,000sf	na	50'	25%	25%
Medium mixed-use Bioscience	Mixed Bio R&D Med*	P	P	P	40,000sf	na	50'	25%	25%
Core mixed-use Bioscience	Mixed Bio R&D Core*	P	C	C	40,000sf	40,000sf	50'	25%	25%
	*see Bioscience Definitions supplement for definitions of these use classifications								*consistent with proposed Planning Dept provision for PDR 'accessory uses'
									*P = principally permitted use *C = conditionally permitted



Bioscience Overlay Zone 2 -- Expansive Area									
Underlying zoning districts in Zone 2									
	Use Classification (in Planning Code)	PDR district	Buffer/ Light PDR district	SLI district	Maximum use size w/o CU	Maximum use size with CU	Min. separation from Res district for BSL3 labs	Max. non-lab Comp Science Office (incl. Admin space)	Max. Admin office space
<b>Bioscience Uses</b>									
<b>Option 1 (permissive)</b>									
Light mixed-use Bioscience	Mixed Bio R&D Light	P	P	P	5,000sf	na	50'	100%	25%
		P	P	P	7,500sf	na	50'	60%	25%
		C	C	C	na	30,000sf	50'	60%	25%
Medium mixed-use Bioscience	Mixed Bio R&D Med	P	P	C	60,000sf	60,000sf	50'	50%*	25%
Core mixed-use Bioscience	Mixed Bio R&D Core	P	C	NP	60,000sf	60,000sf	50'	50%*	25%
<b>Option 2 (moderate)</b>									
Light mixed-use Bioscience	Mixed Bio R&D Light	P	P	P	5,000sf	na	50'	100%	25%
		C	C	C	na	20,000sf	50'	40%	25%
Medium mixed-use Bioscience	Mixed Bio R&D Med	P	P	C	60,000sf	60,000sf	50'	40%	25%
Core mixed-use Bioscience	Mixed Bio R&D Core	P	C	NP	60,000sf	60,000sf	50'	40%	25%
<b>Option 3 (restrained)</b>									
Light mixed-use Bioscience	Mixed Bio R&D Light	P	P	P	2,500sf	na	50'	100%	25%
		C	C	C	na	15,000sf	50'	25%	25%
Medium mixed-use Bioscience	Mixed Bio R&D Med	P	P	C	40,000sf	40,000sf	50'	25%	25%
Core mixed-use Bioscience	Mixed Bio R&D Core	P	C	NP	40,000sf	40,000sf	50'	25%	25%
									*consistent with proposed Planning Dept provision for PDR 'accessory uses'

<b>PDR Districts (outside Overlay zones)</b>										
	<b>Use Classification (in Planning Code)</b>	<b>PDR district</b>	<b>Buffer/ Light PDR district</b>	<b>Min. separation from Res district for BSL3 labs</b>	<b>Max. Accessory Uses* (incl. Admin space)</b>	<b>Max. Admin office space</b>				
<b>Bioscience Uses</b>										
<b>Manufacturing</b>										
Biotech Pilot Mfg	Medium PDR	P	P	50'	50%	25%				
Biotech Mfg	Core PDR	P	C	50'	50%	25%				
Pharmaceutical Pilot Mfg	Medium PDR	P	P	50'	50%	25%				
Pharmaceutical Mfg	Core PDR	P	C	50'	50%	25%				
<b>Warehousing/Distribution</b>										
Warehouse	Core PDR	P	P	50'	50%	25%				
Cold Storage	Medium PDR	P	P	50'	50%	25%				
Freezer Storage	Medium PDR	P	P	50'	50%	25%				
										*consistent with proposed Planning Dept provision for PDR 'accessory uses'
<b>NC and C Districts</b>										
	<b>Use Classification (in Planning Code)</b>	<b>NC districts</b>	<b>C districts</b>	<b>Max. Accessory lab</b>						
<b>Bioscience Uses</b>										
<b>Research Offices</b>										
Bioinformatics	Office	C	P	40%						
Data Center	Office	C	P	40%						
Imaging (MRI)	Office	C	P	40%						
<b>Vendors</b>	Biomed Sales	C	C	40%						

## **Bioscience Use Definitions** (supplement to zoning controls)

### **A Mixed Use**

Bioscience is a mixed use comprised of office, research office, research and development laboratories vivarium, warehouse and equipment areas. The type of business, research science, or product manufacturing determines the concentration of each use. For example, manufacturing uses are generally comprised of the same use elements as most labs but typically require larger requirements for chemical processing, utility and equipment support, and material handling components of warehouse and provisions for frequent truck transactions. Computational science on the other hand is more similar to a typical office use with particular provisions for large amounts of data storage, requiring little, if any, truck access.

Like the PDR definition of December 2003, Bioscience activities can be grouped into core, medium and light activities based on a number of factors: the total amount of building space required for the business; the amount of space needed per worker; the amount of space required for equipment and storage, both inside and outside; the type of loading facilities required; the amount of trucking activity generated; hours of operation, as well as some of the environmental impacts such as noise, odors, lighting and the treatment of hazardous and/or infectious materials.

### **Light Bioscience Uses**

This category includes Bioscience activities that include administrative office, research office, development biology and chemistry labs, vivarium/ animal facilities, computational research/ bioinformatics labs, requiring only small amounts of trucking or noisy outdoor support areas.

**1) Research and Development Laboratory** The biotech industry requires a diversity of research buildings to evolve technologies and therapeutics. The following area use categories are intended to group fundamentally similar utility and systems users so that economies of scale can be achieved. A modular approach to the research space will typically be deployed for preservation of flexibility as science programs in the biotech industry are constantly evolving. Biotech companies perform research and development, requiring laboratories and offices to be collocated. The metric used in the industry for researchers combined office and lab area ranges from 450-650 square feet/ researcher. The following types of research labs are prevalent in the bioscience industry:

a) **Biological Laboratory** Microbiology is required in numerous scientific pursuits within the industry. Biology labs may be further classified by the types of infectious agents they contain:

i) **Biosafety level 1** Typically for education and training, work performed in these labs with defined and characterized strains of viable microorganisms not known to consistently cause disease in adult humans. Biosafety level 1 represents a basic level of containment that relies on standard microbiological practices with no special primary or secondary barriers recommended, other than a sink for handwashing.

ii) **Biosafety Level 2** Typically for clinical, diagnostic, teaching and other laboratories in which work is done with broad spectrum of indigenous moderate risk agents that are present in the community and associated

with human disease of varying severity. Typically organisms in BSL2 labs are not known to be transmissible by the aerosol route. Organisms that may pose this risk are handled in Biosafety cabinets, or in primary containment equipment. Other primary barriers in BSL2 include splash shields, face protection, gowns and gloves. Secondary barriers such as handwashing sinks and waste decontamination facilities are required to reduce potential environmental contamination.

iii) **Biosafety Level 3** Typically for clinical, teaching, research, or production facilities in which work is done with indigenous or exotic agents with a potential for respiratory transmission, and which may cause serious and potentially lethal infection. In BSL3 more emphasis is placed on primary and secondary barriers to protect personnel in contiguous areas, the community, and the environment from exposure to potentially infectious aerosols. All laboratory manipulations should be performed in a BSC (Biosafety Cabinet) or other enclosed equipment, such as a gas tight aerosol generation chamber. Secondary barriers for this level include controlled access to the laboratory and ventilation requirements that minimize the release of infectious aerosols from the laboratory.

iv) **Biosafety Level 4** Not recommended for any of the zones reviewed by the task force.

b) **Chemistry / BioChemistry/Analytical Laboratory** Organic chemistry is integral to the biotech and pharmaceutical therapeutic discovery and development process. Equipment used to analyze therapeutics like high performance liquid chromatography, require organic solvents and special ventilation requirements. In organic chemistry laboratories almost all of the operations are with a fume hood. Organic chemistry is performed in fume hoods and therefore requires large amounts of HVAC, and supporting mechanical equipment that can be noisy.

c) **Animal Facilities/ Vivarium** Research and development labs are supported by animal facilities used for efficacy and toxicology testing prior to clinical trials in humans. Animal facilities are classified BSL1-4 the same way labs are, with particular protocols and segregation requirements for shipping and receiving areas, biohazard waste removal, insuring that these are not mixed with non hazardous supply and waste streams, avoiding cross contamination. Segregated truck access and frequent transactions are required to manage vivarium environments.

d) **Engineering Laboratory** Typically used for light assembly and testing of components of equipment. Characterized as a dry lab, this type of laboratory has multiple utility systems supporting the benches and equipment.

e) **Development Laboratory** Scale up activities occur in laboratory environments so that further testing and validation of the product can occur. These labs are characterized typically volume production of a few kilos or 20L of liquid material. Utilities are increased to support this level of production.

f) **Support Lab** Successfully designed open lab environments are quiet, comfortable, and uncluttered because they are supported by labs that collect the noisy, utility intensive, vibration sensitive, and other specialized equipment for

science and remove them from the open lab environment. Cold rooms, freezer rooms, warm rooms, and shared equipment rooms are typically found in rooms adjacent to the open lab. Other typical applications that are considered support include rooms that house ventilated cabinets; analytical equipment, NMR, dark room, raw material pantry, compounds library, autoclave, glassware storage, HTS, centrifuges, robotics, large scale rotovap, and other shared utility intensive equipment.

**g) Quality Assurance/ Quality Control Labs** Typically associated with manufacturing uses, these labs are designed to perform analysis of samples taken during the product development and manufacturing process. These include environmental monitoring as well as material and product samples. These are held in cold storage for years during the product development cycle helping to validate the efficacy and safety of the therapeutics and the environments they are produced within.

**h) Core Lab** These areas are characteristically centralized for efficient use by all laboratory groups and are often a hub of research and development activity. Core functions include central glass wash, central material dispensary, central compounds library. An example of this type of space would be an NMR suite. Other core lab functions include expensive or vibration sensitive equipment, for example SEM, EMI, and HTS robotics. Analytical equipment

**2) Research Office** Office area assignable to lab personnel is distributed in lab buildings in a variety of configurations. Researchers prefer being close to the science, but laboratories are better if segregated from office use. This space includes write up stations, cubicle areas, and private office suites in all laboratory buildings. Laboratory office should be calculated as part of gross area assignable to the research population and not part of corporate administration space for benchmarking purposes.

**3) Computational Science/ Bioinformatics** Data gathered in laboratory environments is stored and analyzed by computers. This requires “dry lab” or spaces that are designed for computer/ human interface to perform a wide range of activities from analysis to imaging. This type of research requires workstation and conferencing environments similar to typical office uses, data storage and server farm capacity in mechanically enhanced zones, and special environments for projecting images and 3d modeling of molecules.

**4) Administrative Office** Office uses are required to support the commercial operation of biotech companies. This use is also typically mixed with other uses such as research, manufacturing, and warehousing due to the highly regulated nature of the business operations. Metrics for density vary greatly depending on the specific charter of a user group. Flexible open office planning is standard. Private offices are used in various ratios depending on the operating philosophy of the business. Private industry requires assembly occupancies enhancing the transfer of technology. Conference spaces are required in a variety of scales. Biotech industry office uses are characteristically less dense than commercial office space as a result.

## **Medium Bioscience Use**

Research and development of biopharmaceutical products require scale up processes that create greater volumes of material for testing and proving compliance with regulatory requirements. Facilities and the impacts they have environmentally are measured by the volume of material they produce. Typically service yards with noisy equipment, cooling towers, WFI, chillers, boilers, air compressors, are in constant operation. Material handling is more intense in pilot production. Operations may require three shifts to meet demands for development cycles. Pilot production facilities are programmed for the process they contain. The occupancy is typically low in regulated facilities.

1) **Pilot Plant/ Clinical Manufacturing** Biotech research and development spaces include pilot plants, enabling scientists to increase scale and optimize molecule development. These include a variety of spaces for the testing, scale-up, and application research of their bulk products. Cell culture, fermentation, recovery and purification processes transform from small volumes (1-5L) at the lab bench scale to upwards of 4000L at process development scale. These are typically organized by business unit and have diverse utility, temperature, occupancy and space requirements. The spaces require flexibility, as they are program/ project driven and focus on the testing and improvement of specific products and applications. Modifications will frequently occur in these spaces to accommodate variable needs. Pilot and Clinical manufacturing generate greater needs for trucking than laboratory uses.

2) **Kilo Lab** Pharmaceutical pilot production and scale up takes place in facilities that handle up to 50 kilos of material. Pharmaceutical processing is typically a powder processing operation and requires dust collection, explosion resistant equipment and explosion venting. The scale of operations determines the severity of this requirement.

## **Core Bioscience Use**

Core bioscience uses include those businesses in diagnostics, therapeutics, or suppliers that are manufacturing, distributing and selling commercial products. The requirements outlined in the December 2003 definition of Core PDR (Citywide Policy Division- San Francisco Planning Department) apply directly to core bioscience uses. Truck access to and from freeways is critical for core bioscience uses. Manufacturing facilities typically require utility yards and expansive paved support areas on the site to maintain and service the supporting systems. Equipment requirements in core bioscience areas significantly more intense than in pilot plants and clinical manufacturing facilities as the volume of production in core areas is higher. Service yards with noisy equipment, cooling towers, WFI stihls, chillers, boilers, air compressors, are in constant operation. These areas are not compatible with residential uses unless sound abatement is deployed.

1) **Warehouse/ Distribution** This use is dedicated to the regulated flow of all materials required for the research, development, and manufacturing of the products. Biotech companies must quarantine and test all materials for quality assurance and compliance with FDA requirements and cGMP's. Test labs and offices for personnel

typically are ancillary uses required for compliance. Particular attention to safety codes and environmental codes and controls are required in warehouse operations as hazardous materials, biologics, product and waste are managed in these facilities. Biotech companies must conform to a management plan documented with and enforced by the local jurisdiction. In core bioscience areas, warehouse and distribution areas are commonly linked with manufacturing operations. Warehouse facilities may be separated from manufacturing operations as well. “Just in time” (JIT) supply methodologies require a high frequency of material transactions between warehouses and proximate manufacturing areas.

2) **Manufacturing** Processes for manufacturing define the parameters for the facilities within which they reside. Biotech processing require process utilities to support the equipment and unit operations required to manufacture the product. Most biotech manufacturing processes require operations in “clean room” environments. These classified environments are designed to be cleanable, visually accessible, and conform to flows of personnel, materials, equipment, trash and product required by the FDA to comply with current good manufacturing practice (cGMP). Utility yards and paved support areas are typically adjacent to manufacturing areas. Due to the high level of regulation, quality control and quality assurance labs and offices are required ancillary uses of manufacturing. The quantity of these uses depends on the process size and complexity.

## **APPENDIX VII - Text of the OLA Bioscience Report**

Office of the Legislative Analyst >> Legislative Analyst Reports

Legislative Analyst Report - Bioscience Industry  
LEGISLATIVE ANALYST REPORT

TO: The Honorable Board of Supervisors  
FROM: Elaine Forbes, Legislative Analyst  
HEARING: N/A  
DATE: June 26, 2002  
ISSUE: Bioscience Industry

### Summary of Request

A motion passed by the Board (File 01-2024) requests that the Office of the Legislative Analyst (OLA) research and report on the bioscience industry, particularly as it relates to land use, planning, and health and safety issues. In response, this report considers current San Francisco land use, zoning, and health and safety practices in regard to bioscience firms, reviews the policies of surrounding jurisdictions, and offers recommendations.

### Executive Summary

Defining the bioscience industry, also called the biotechnology industry, is challenging because bioscience has many diverse applications ranging from developing diagnostic tests that spot cancers to designing bugs that will clean brownfield contaminants. Generally, the bioscience industry can be divided into three subsections: diagnostics, therapeutics and the supplier sector. Long product cycles, high private expenditures for research, and a tendency to form geographic clusters characterize the bioscience industry. According to the Mayor's Office of Economic Development, the goal of the City of San Francisco is to encourage the bioscience industry to locate within the City because of the potential economic benefits.

Unlike some Bay Area cities that are home to many bioscience firms, San Francisco does not expressly identify bioscience within a use category.<sup>1</sup> Instead, bioscience is addressed in a 1988 Zoning Administrator interpretation and in the Jobs Housing Linkage and Impact Fees section. Presently, bioscience laboratories are permitted as a primary use only in the industrial zones and, generally, downtown commercial districts. However, because the Planning Code does not contain one use category that encompasses all of the various functions that may make up a bioscience facility, the Planning Department has discretion in characterizing the principle use of a bioscience firm and in determining where bioscience firms are allowed.

A well-developed set of federal and state regulations apply to the industry. The OLA was unable to find an example of another jurisdiction in California that has adopted additional health and safety controls specifically for bioscience firms beyond those required by State and Federal law.



In order to develop land use controls for bioscience, the City must articulate the nature of the use and identify issues that may arise from that use. Bioscience consists of several functions, including wet laboratories and laboratory support, computer research, and office functions. Additionally, bioscience firms tend to change over time; thus, particular functions may be more or less prominent depending on the stage of the product cycle. A sample of local cities, combined with a consideration of the specific conditions San Francisco presents, yields alternatives that the Board of Supervisors may wish to consider. Following the direction of the Board of Supervisors to the Planning Department regarding Citywide planning and increased public participation, this report recommends that these controls be vetted in a public process. The Board may wish to establish interim controls for bioscience applications Citywide or within certain districts (mixed use and commercial) until the Planning Department and/or another appropriate group creates appropriate permanent zoning controls in collaboration with a public process (Task Force, Working Group, and/or as part of Better Neighborhoods planning). The Board of Supervisors may wish to direct the group(s) charged with the development of these controls to consider creating a new use classification that expressly includes bioscience. Whether to establish interim controls and/or a task force or working group is a policy decision for the Board of Supervisors.

## Background

Defining the bioscience industry presents challenges because bioscience has many diverse applications ranging from developing diagnostic tests that spot cancers to designing bugs that will clean brownfield contaminants. The U.S. Office of Technology Assessment defines bioscience as "any modern technology that uses living organisms (or parts of organisms) to produce or modify products, to improve plants or animals, or to develop microorganisms for specific uses".

According to the California Health Institute, the bioscience sector began in 1975 when Herb Boyer, a biochemist from UCSF and Bob Swanson, a venture capitalist, started Genentech in a warehouse in South San Francisco.<sup>2</sup> The present day bioscience industry in the Bay Area can be divided into three subsections. The diagnostics section involves the creation of products used to analyze and detect various sicknesses. The therapeutics sector involves designing products that cure sicknesses. The supplier sector involves providing capital goods, machinery, instruments, software, and reagents for research and production.<sup>3</sup> Long product cycles, high private expenditures for research, and a tendency to form geographic clusters characterize the bioscience industry.<sup>4</sup>

The bioscience sector is concentrated in California, Massachusetts, New Jersey, New York, North Carolina and Washington.<sup>5</sup> The Bay Area has the highest concentration of bioscience in California in terms of number of employees and firms.<sup>6</sup> According to the California Health Institute, over 747 bioscience firms employing 85,000 people are in the Bay Area.<sup>7</sup> The University of California at San Francisco has spun off approximately 60 bioscience startups, including Genentech and Chiron. However, to date only one bioscience firm has located in San Francisco County.<sup>8</sup> Bioscience firms are agglomerated in the South and East Bays, with clusters in South San Francisco, Richmond, Hayward/Fremont and Palo Alto. According to Jesse Blout, Deputy Director of the Mayor's Office of Economic Development, the epicenter for bioscience is Palo Alto. The East Bay is home to about 1/3 of all companies. Suppliers to these firms are located throughout the Bay Area proximate to bioscience companies.

## Economic Impacts<sup>9</sup>

According to Jesse Blout, Deputy Director of the Mayor's Office of Economic Development, attracting the bioscience industry to San Francisco has the potential to be a source of long-term economic stability for San Francisco. The presence of the University of California at San Francisco (UCSF) new 43-acre Mission Bay research campus, expected to employ over 9,000 researchers and staff at full build-out, represents a unique opportunity to attract biotech companies to San Francisco that would otherwise locate elsewhere in the region or in other parts of the United States and the world.

The principal benefits of the bioscience industry for San Francisco include the following:

- High paying direct jobs: the average annual salary of biotech worker in California was \$64,353 in 2000 (California Healthcare Institute, 2002).
- A high job "multiplier": estimates are that for every one direct biotech job created, two to five indirect jobs are created.
- Diversification of the local economy to include a more stable, human-health based industry
- Significant fiscal benefits to San Francisco, including:
  - o Payroll taxes: The high wage structure for Biotech translates into potential increased payroll taxes for the City of San Francisco.
  - o Property taxes: The extraordinarily high capital investment required for biotech facilities (for instance, typical tenant improvement costs are as high as \$200 - \$250/square foot, compared with an average of \$20 - \$30 for an office building) generate much higher property tax revenues on a square foot basis compared to comparable commercial use.
  - o Transit Occupancy Taxes: A growing biotech sector in San Francisco will attract business travelers from around the U.S. and the world, which leads to increased hotel tax revenue.
  - o Venture capital investment: the bioscience industry in the Bay Area attracts investment capital from all over the world.

### Overview of Bioscience Facilities

According to Christopher Scott, Assistant Vice Chancellor of University Industry Partnerships for UCSF, bioscience firms may be configured in a variety of ways ranging from large research laboratories to primarily office-type space. Non-laboratory space includes office space, laboratory work stations outside the laboratory, areas containing science equipment and research materials, libraries, and other types of space associated with research functions. According to Scott, bioscience firms also tend to change over time, as office and research functions may expand or contract depending on the stage of the product cycle. The amount of office space versus laboratory or other

types of research space depends not only on the stage of the product cycle but also on the type of bioscience firm. The mapping of the human genome has created the potential to conduct bioscience research by means of computers. This new type of bioscience research, called bioinformatics, is hypothesized to be an important emerging field in bioscience. To date bioscience research is primarily laboratory-based.

While no "typical" bioscience building exists, according to Sean Charpentier's research on behalf of the Mayor's Office of Economic Development, bioscience buildings differ from office buildings in four ways:

1. Bioscience buildings typically require more mechanical infrastructure, including complex HVAC systems because the air in buildings cannot be recycled and the temperature needs to be closely regulated. In addition, there is usually a requirement for separate piping systems to carry different grades of water and/or different waste streams. The need for a great deal of mechanical infrastructure frequently necessitates higher ceilings, ranging up to 17 feet high
2. Some bioscience firms have back-up power generators because of the need to maintain a constant temperature and humidity in rooms where experiments are occurring. The backup generators would provide power in the case of a power outage, thereby maintaining the integrity of ongoing research projects. Generators are typically stored in service yards outside or on the roof.
3. Some bioscience firms either have a vivarium, a facility to house animals, or a greenhouse.
4. Bioscience firms tend to have lower ratios of employees per square foot of building space. Ratios in bioscience firms range from one employee per 350 to 450 square feet of building space, compared to an average range of one employee per 250 to 300 square feet of building space in a typical office building.

#### Current Law and Practice - Land Use

The San Francisco Planning Department has limited experience in processing the permits for bioscience firms. This report reviews the San Francisco Planning Code, considers the treatment of bioscience uses in the Mission Bay South Redevelopment Plan Area, and uses a bioscience firm that located in San Francisco in June 2002 as a case study. This section was written in collaboration with Deputy City Attorney Elaine Warren.

Planning Code Use Districts and Zoning Bulletin Interpretation. Presently, the Planning Code does not include the term "bioscience" in the use classifications of the Planning Code. However, a 1988 Zoning Administrator bulletin clarified which zoning districts permit Research and Development (R&D) facilities. The Zoning Administrator defined an R&D facility as a facility that has as its primary purpose scientific or technical research and development activities. Within the definition of R&D, the bulletin includes several subcategories of uses that relate to bioscience activities: research laboratories, support and related materials, equipment and support facilities, and administrative and record-keeping services needed for managing research and development facilities. The bulletin interprets R&D facilities as uses within Planning Code Sections 226(d) (light manufacturing not otherwise specifically identified in the Planning Code); 226(e)

(industrial or chemical research or testing laboratories not including a danger of explosives); and 226(f) (experimental laboratory). Under the current Planning Code, uses within Sections 226(d) through 226(f) are permitted in M-1 and M-2 zoning districts. Section 226(e) uses are also permitted in C-3-O, C-3-R, C-3-G, C-3-S and C-M zoning districts. Section 226(f) uses are conditional uses in C-3-S and C-M districts.

According to former zoning administrator Robert Passmore, the Bulletin was written primarily to address medical facilities. The issue of concern at that time centered on explosives and toxic releases. The Bulletin indicates that rezoning proposals for the South of Market area ("SOMA") were under consideration at the time. These proposals would have continued to allow certain light industrial uses in certain SOMA districts, including light manufacturing/industrial or a chemical research/testing laboratory not involving any danger of explosions. However, the current South of Market mixed use districts that permit light industrial uses (SPD, RSD, SLR, SLI, SSO) disallow "chemical processing of materials" or any uses allowed under Sections 226(e) through 226(w). Consequently, bioscience laboratories are permitted as a primary use only in the industrial zones and, generally, in downtown commercial districts.

Jobs Housing Linkage and Impact Fees (Section 313.1). In 2001, the City revised its ordinance requiring developers of certain projects to contribute to affordable housing through fees or housing construction (Planning Code Sections 313 through 313.15). Uses that pay fees are entertainment, hotel, office, research and development, and retail. Bioscience is included expressly in the Research and Development (R&D) category defined as follows:

"Research and development use" shall mean space within any structure or portion thereof intended or primarily suitable for basic and applied research or systematic use of research knowledge for the production of materials, devices, systems, information or methods, including design, development and improvement of products and processing, including bioscience, which involves the integration of natural and engineering sciences and advanced biological techniques using organisms, cells, and parts thereof for products and services, excluding laboratories which are defined as light manufacturing uses consistent with Section 226 of the Planning Code."

A study prepared by the City in support of fees for different categories of development projects showed that research and development uses had fewer employees per square foot than office uses but more employees per square foot than entertainment, hotel and retail.<sup>10</sup> OLA research for this report supports this finding.

Mission Bay South Redevelopment Plan. The Mission Bay South Redevelopment Plan contains residential, hotel, commercial industrial, commercial industrial/retail, UCSF, public facility and open space use districts. The commercial industrial, commercial industrial/retail and UCSF districts allow activities that encompass bioscience operations. Uses specifically allowed in these districts include various types of laboratories, laboratory support facilities, office-based or computer-based research facilities, medical research facilities, and bio-technical research facilities. Areas that allow bioscience (and other commercial/industrial uses) do not allow residential uses and are separated from residential use areas in Mission Bay South by open space.

Case Study. The bioscience firm that located in San Francisco in the first quarter of 2002 located in an SSO district South of Market. This district excludes chemical research or

testing laboratories (see above) as a principle use. According to the Zoning Administrator, Lawrence Badiner, this application was approved because laboratory space made up less than 25% of the firm's total square footage. Accordingly, the plan was approved as an office use, with the laboratory considered an accessory use.

The Planning Code does not contain one use category that encompasses all of the various functions that may make up a bioscience facility. Consequently, as this test case shows, the Planning Department has discretion in characterizing the principle use of a bioscience firm and in determining where bioscience firms are allowed. According to Zoning Administrator Lawrence Badiner, a major disadvantage of treating bioscience firms as office is that it requires such firms to get office allocations under Proposition M (for more detail, see below under Issue Analysis).

### Jurisdictional Comparison

This report surveys Alameda, Emeryville, Berkeley, South San Francisco, Palo Alto and San Jose to ascertain how local jurisdictions with bioscience firms treat them in their planning codes. Of the cities surveyed, no city has a separate land use category for bioscience. However, all have one use category that encompasses bioscience. Most (Alameda, South San Francisco, Palo Alto and San Jose) include bioscience in a Research and Development category. Berkeley includes bioscience in the "Other Industrial Use" category, which includes other types of laboratories. Emeryville includes bioscience in a "High Technology" category.

Where Allowed. Cities generally allow bioscience firms in industrial and manufacturing zones, with some exceptions. Alameda and San Jose generally restrict bioscience to planned business park areas. San Jose only allows bioscience firms in the IP Industrial Park Zoning District in order to protect space for other, more traditional light and heavy industry uses. Where bioscience is allowed in mixed-use zones, a conditional use permit is usually required. Two of the cities surveyed (Emeryville and South San Francisco) require conditional use permits for bioscience in all zones, including manufacturing zones. Berkeley also requires conditional use permits for the mixed manufacturing zone. None of the cities surveyed allow bioscience firms in commercial zones, unless those zones are part of planned business parks.

Proximity. Berkeley is the only city surveyed that specifies how proximate bioscience firms may be to residential uses. Berkeley uses laboratory biosafety level classifications to determine how far facilities must be from residential uses. Biological materials handled by laboratories are classified based on the hazards to human beings associated with the organisms, with Class 1 organisms posing the least risk and Class 4 organisms posing the greatest risk.<sup>11</sup> In Berkeley, laboratories using Class 2 organisms are prohibited within 500 feet of residential or mixed-use residential districts. The other cities surveyed rely on the homogeneity of the zones and the setback and, side and rear yard requirements to buffer industrial and manufacturing uses from residential uses. For example, in South San Francisco bioscience firms are located on the East Side of Highway 101 and virtually no residential uses are on that side of the freeway. The Mission Bay South Plan uses a similar approach, separating residential uses from zones that allow bioscience functions. The ability to use this approach elsewhere in San Francisco may be limited, however, given the richly varied land uses in some areas that change dramatically from block to block.

Building design. The cities surveyed rely on the Unified Building Code (UBC) to deal with issues of rooftop equipment, exhaust systems, and seismic safety.

## Health and Safety

Bioscience firms that contain wet laboratories (laboratories handling biological materials) are regulated like hospitals in terms of how they must dispose of biohazardous and medical waste. In addition, a complex set of federal, state and local laws regulate substances used by bioscience firms that are considered hazardous materials or wastes. Please see Attachment 1: Regulatory Framework for a description of the general regulatory framework for bioscience firms, including regulations pertaining to onsite hazardous materials, hazardous waste, biological safety, biohazardous waste, radioactive materials, air quality, water quality, and occupational safety.

The OLA could not find an example of a jurisdiction in California that has adopted health and safety controls specifically for bioscience firms. In San Francisco, bioscience firms, like other firms that handle hazardous materials or wastes or generate medical wastes, are subject to regulation by the San Francisco Department of Public Health. This section briefly describes the regulatory framework for hazardous materials and waste, medical waste and industrial discharges to air and water.

Hazardous waste and hazardous materials. A number of federal and state laws define and regulate hazardous waste and hazardous materials. Federal law regulates hazardous waste from its creation to ultimate disposal. As is the case with several federal environmental regulatory schemes, federal law provides for state enforcement. California has chosen to enforce federal laws that regulate hazardous wastes. It has also adopted additional laws regulating both hazardous wastes and hazardous materials. California certifies local agencies to implement and enforce many provisions of these laws. Such agencies are called Certified Unified Program Agencies (CUPAs). In San Francisco, the San Francisco Department of Public Health is the CUPA for the use, storage, and generation of hazardous materials and hazardous waste. San Francisco has supplemented California laws that regulate hazardous materials through the adoption of the Hazardous Materials Permit and Disclosure Ordinance, Health Code Chapter 21. Key requirements imposed on businesses handling hazardous materials include:

- Hazardous Materials Business Plan: Describes the type and quantities of the hazardous waste/material on site and the storage facilities. Hazardous waste must be stored in leak proof containers that are labeled. Secondary containment guidelines are provided to control for accidental spills. Disclosure requirements specifically apply to wet laboratories.
- Emergency Response Plan: Describes how the facility will respond to an emergency.
- Training Plan: Describes the training procedures to educate the workforce about the proper handling methods.

If a facility that generates hazardous waste plans to treat the waste, additional requirements apply. Hazardous waste must be hauled by a state-licensed hauler and can only be disposed of at a State permitted treatment, storage, and disposal facility (TSD facility).

California regulates medical waste, like hazardous waste, from its creation to its disposal. San Francisco implements the state law and stricter local requirements through Health Code Chapter 25.

The storage, use, transport, and disposal of radioactive materials are regulated by federal law, which in turn provides for state enforcement. California implements the federal law through the California Radiation Control Act.

**Air.** The federal Clean Air Act regulates toxic air contaminants and priority air pollutants. In California, the Air Resources Board and local air quality districts implement the Clean Air Act. The Bay Area Air Quality Management District (BAAQMD) monitors and regulates the particulate, vapors, and gases that facilities emit. A bioscience firm would require a permit to operate if its emissions exceeded BAAQMD thresholds. Additionally, the BAAQMD requires a laboratory to apply for an air permit if the gross area of the lab is larger than 25,000 square feet or if there are more than 50 fume hoods. Laboratories that do not exceed these thresholds do not have to apply for a permit provided that they adhere to BAAQMD's Responsible Laboratory Management Practices.<sup>12</sup>

California Health and Safety Code Sections 25531-25543 implement provisions of federal law designed to prevent releases of toxic air contaminants. This state law requires the preparation of risk management prevention plans for users of certain quantities of acutely hazardous materials. DPH oversees preparation of risk management prevention plans through Health Code Article 21A.

**Water.** The federal Clean Water Act regulates industries that discharge wastes to water bodies or sewer systems. In general, the rules and regulations for bioscience firms are the same as for other industrial entities and hospitals. No facility is allowed to release hazardous materials or waste into the environment or the sewer system. All industrial discharges into the sewer are regulated according to the pretreatment standards established under the Clean Water Act. San Francisco implements the federal law through the Industrial Discharge Ordinance, which requires permits for discharges to the sewer system. In San Francisco, there are two types of discharge permits. Class I, permits are for significant industrial dischargers while Class II permits are for minor industrial dischargers. (Article 4.1, Sec. 119). Dischargers must comply with federal pretreatment standards in addition to meeting local requirements. The bioscience industry, for example, may be required to adjust the pH (acidity) level of its waste water before the waste can be released into the sewer system.

#### Issue Analysis: Zoning and planning

Unlike some of the surrounding cities that are home to many bioscience firms, except in Mission Bay South, San Francisco does not expressly identify bioscience as included within a use category. Since bioscience can consist of a variety of functions, where a particular bioscience use may locate depends on which of those functions is deemed the principle use.

According to San Francisco Zoning Administrator Lawrence Badiner providing a definition of bioscience and identifying the zoning districts where the use is allowed is preferable to the current system in San Francisco for the following reasons: (1) it would provide the industry and developers for the industry with more certainty; (2) the City

could more proactively prepare and plan for the industry should an agglomeration of bioscience firms form in San Francisco; (3) the City could more easily take health and safety issues into consideration; and, (4) bioscience uses that are not classified as office space under Proposition M would not compete with office users for office space allocation.

In order to develop appropriate land use controls for bioscience uses, according to former Zoning Administrator Robert Passmore, the City must articulate the nature of the use and identify issues that may arise from that use. A sample of local cities, combined with a consideration of the specific conditions San Francisco presents, yields several alternatives that the Board of Supervisors may wish to consider.

According to Mr. Passmore, the primary issue to consider when developing zoning controls is the compatibility of the use with other uses. The laboratory component of bioscience uses may raise special health and safety considerations. Although laboratories are highly regulated, the City may have concerns about regulatory compliance and want assurances that facilities are well prepared to respond to emergency situations. One way in which the City currently regulates laboratories involves the Department of Public Health's requiring laboratories to submit information on the types and quantities of hazardous materials that the laboratory uses and to prepare emergency response plans. This information is available to the public. Additional requirements apply to users of acutely hazardous materials. The Board of Supervisors is also in the process of considering legislation that would further regulate standby emergency generators.

Unless a bioscience firm is engaging in production, most other aspects of bioscience are more akin to commercial uses than industrial uses, according to Mr. Badiner. Mr. Badiner's impression is that in terms of employment, as demonstrated by the Job Housing Nexus, bioscience has fewer employees per square foot of space than office and retail uses and the parking demand is consequently less intensive. This information can be taken into account in considering the intensity and density of bioscience use (including traffic and parking) and the compatibility of bioscience uses with other uses.

**Parking and Traffic.** Bioscience uses may raise neighborhood concerns about adequacy of parking and traffic congestion. These issues are not unique to bioscience uses. City restrictions on parking may impact bioscience firms' decisions to locate in San Francisco given that the City's maximum allowance of parking may be less than what is allowed by other jurisdictions.

**Compatibility with other Uses - Agglomeration.** The OLA survey of local jurisdictions indicates that bioscience firms do tend to agglomerate regionally but may be dispersed at the local level. Alameda and Berkeley both have bioscience firms scattered throughout the city, for example. The land use patterns of the jurisdiction can influence how proximately bioscience firms locate to one another. There is a large cluster of bioscience firms in South San Francisco and a large cluster in the Palo Alto/Mountain View/Sunnyvale area. However, because bioscience firms tend to disperse at the local level, bioscience does not appear to be incompatible with the presence of other industrial and research and development activities.

**Proposition M.** Whether bioscience space requires a Proposition M allocation depends on whether the use meets the definition of office space in the Proposition. Bioscience



firms face a conundrum in this regard. One, firms may have difficulty determining whether a particular part of a bioscience function counts as office space under the Proposition M definition. Two, bioscience functions within a firm may change over time and the amount of space that may meet the definition of office space under the Proposition may change. Given these uncertainties, bioscience firms may seek Proposition M allocations for their entire operations, as was done in the case of Mission Bay. This approach has two consequences. One, bioscience firms may absorb limited office space and restrict other office uses beyond the intent of the Proposition. Two, obtaining a Proposition M allocation adds a layer of complexity to the sector. No other jurisdiction surveyed imposed special requirements on office functions of bioscience firms or required businesses to distinguish between office and non-office functions. This additional requirement may encourage firms to locate in nearby cities that lack such requirements. If attracting bioscience firms to San Francisco is of interest to the Board, it may wish to pursue this issue further. There are many existing projects that already have a Prop M. allocation and in some cases this works, but the planning department is looking at this as a case-by-case basis.

### Potential Solutions

Developing effective zoning controls for bioscience will have the benefits of providing certainty for the industry and for the City by giving the City the ability to more proactively prepare and plan for the industry. Following the direction of the Board of Supervisors to the Planning Department regarding Citywide planning and increased public participation, this report recommends that these controls be vetted in a public process. The Board may wish to impose interim controls on bioscience applications Citywide or within certain districts (mixed-use and commercial) until the Planning Department and/or another appropriate group creates appropriate zoning controls in collaboration with a public process (Task Force, Working Group, and/or as part of Better Neighborhoods planning). The Board of Supervisors may wish to direct the group(s) charged with the development of these controls to consider the following options:

Option 1 - Status quo. Under the current Planning Code, bioscience laboratories are permitted as a principle use in M-1 and M-2 zoning districts. Section 226(e) uses are also permitted in C-3-O, C-3-R, C-3-G, C-3-S and C-M zoning districts. Section 226(f) uses are conditional uses in C-3-S and C-M districts. In addition to these zoning districts, bioscience laboratories may be allowed as an accessory use in the South of Market Planning Area. This approach provides the Planning Department with a great deal of flexibility in approving applications from bioscience firms when laboratory space makes up less than 25% of the total space in the South of Market Planning Area. However, few bioscience firms may have less than 25% of total space for laboratories. According to Sean Charpentier's research on behalf of the Mayor's Office of Economic Development, between 30-50% of a typical bioscience building is used for office purposes. In addition to office and laboratory space, bioscience firms utilize research areas, libraries, and other types of spaces that are neither laboratory nor office. This approach will limit facilities with larger laboratories to the downtown commercial and industrial zones or Mission Bay South commercial industrial areas. For the bioscience firms that do have laboratories which makeup less than 25% of their total space, the status quo may entail, however, that these firms seek office allocations under Proposition M even though all of the firms' space does not count as office space under the Proposition.<sup>13</sup>

Option 2 - Create a new use classification that expressly includes bioscience. In addition to expressly allowing bioscience uses in Mission Bay South, the City could add a use classification to the Planning Code that (1) defines bioscience to include both the laboratory and non-laboratory components and (2) designates the zoning districts in which the use is permitted or conditionally permitted. The City may not want to limit the new use category to bioscience, but define it more broadly to include other types of research and development uses, as is done in other jurisdictions. In determining where bioscience uses should be permitted, considerations include:

1. Hazardous materials use. The City may require firms to submit information about the nature and quantity of hazardous materials that they will use. This information can be used to determine appropriate environmental review and mitigation of environmental impacts and to track compliance with Department of Public Health hazardous materials registration requirements and applicable state and federal law requirements.
2. Proximity to residential uses. The City may wish to provide for a minimum amount of separation between residential uses and bioscience uses.
3. Agglomeration. The City may wish to encourage agglomeration of bioscience uses. In evaluating this issue, the City should take into account the previous authorization of bioscience uses in the Mission Bay South Redevelopment Plan area.
4. Parking. The City may wish to develop parking minimums or maximums tailored to bioscience uses.
5. Displacement of other uses. The City may wish to consider whether allowing bioscience uses in certain locations will discourage the location of other uses that it wishes to encourage. For example, if the City only allows bioscience uses in industrial areas, will this have the consequence of encouraging the displacement of industrial uses that the City wants to preserve?
6. Production uses. The City may wish to allow bioscience uses that include production facilities in different areas than other bioscience uses.

#### Conclusion

Providing a definition of bioscience and identifying the zoning districts where the use is allowed is likely preferable to the current system in San Francisco for the following reasons: (1) it would provide the industry and developers for the industry with more certainty; (2) the City could more proactively prepare and plan for the industry should an agglomeration form in San Francisco; and (3) the City could more easily take health and safety issues into consideration. However, developing appropriate controls will require the City to articulate the nature of the use and to identify issues that may arise from that use.

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**ATTACHMENT 1 REGULATORY FRAMEWORK**

	<b>Federal</b>	<b>State</b>	<b>Local</b>
Onsite Hazardous Materials	Emergency Planning and Community Right-to-Know Act regulates hazardous materials releases.	Hazardous Materials Release Response Plans and Inventory Law incorporates federal requirements and more stringent state requirements. California Building and Fire Codes regulate building standards and material container requirements for different hazardous materials.	San Francisco Hazardous Materials Permit and Disclosure Ordinance implements state law and stricter local requirements. Businesses with hazardous materials on site must file Hazardous Materials Business Plan, Emergency Response Plan and Training Plan. Building Department and Fire Department implement Building and Fire Code requirements applicable to hazardous materials use in buildings.
Hazardous Waste	Resources Conservation and Recovery Act regulates hazardous wastes from creation to ultimate disposal.	Hazardous Waste Control Act implements federal law and additional California requirements related to generation, transportation, treatment, storage, and disposal of hazardous waste in the state.	Health Code Chapter 22 provides for Health Department enforcement of certain provisions of the state requirements.
Biological Safety	Laboratories conducting NIH funded research must follow guidelines developed by the U.S. Department of Health and Human Services.		San Francisco Hazardous Materials Permit and Disclosure Ordinance tracks use of infectious agents.
Biohazardous Waste		California Medical Waste Management Act imposes “cradle to grave” tracking system and monitoring system for facilities storing, treating and disposing of medical waste.	Health Code Chapter 25 implements state law and stricter local requirements.
Radioactive Materials	Atomic Energy Act regulates the use and control of radioactive material.	California Radiation Control Law implements federal law and governs storage, use, transport and disposal of	

		radioactive material.	
Air Quality	Clean Air Act regulates toxic air contaminants and priority air pollutants.	Health and Safety Code Sections 25531-25543 require users of acutely hazardous materials to prepare risk management prevention plans to avoid releases of toxic air contaminants. BAAQMD requires permits for laboratories with more than 25,000 square feet or more than 50 fume hoods.	Health Department implements state law through Health Code Chapter 21A.
Water Quality	Federal Clean Water Act regulates industrial discharges.	Porter Cologne Water Quality Control Act implements federal law and stricter state requirements.	San Francisco Industrial Waste Discharge Ordinance implements federal and state requirements applicable to sewer systems and requires wastewater discharge permits for discharge to City sewer.
Occupational Safety	Fed/OSHA regulates worker safety including handling of hazardous materials and bloodborne pathogens.	Cal/OSHA obligates many businesses to prepare Injury and Illness Prevention Plans and Chemical Hygiene Plans.	

## Attachment 2: Allowable Zones

City	Where bioscience firms are allowed
Alameda	MX (mixed use) and CM (commercial/manufacturing), Intermediate and General Industrial Zones (M-1 and M-2) zones. Biotech intended to be located in two Business Park areas, one of which is MX and the other of which is CM.
Emeryville	Requires a conditional use permit. With CUP, allowed in light industrial, general industrial and mixed used zones - which cover over half of the City.
Berkeley	Mixed Manufacturing with permit or permit with public hearing, depending on size. Mixed Use-Light Industrial with restrictions based on type of organism tested on.
South San Francisco	Most of biotech is on R&D side; SSF does not have much of the manufacturing side. Standard biotech labs are allowed in industrial zones, but since use permit is required for all non-res. uses with more than 100 vehicle trips per day, R&D is basically conditional in all zones. Use permitted in industrial and planned commercial zone (Office Park). Not allowed in mixed commercial use or commercial zone.
Palo Alto	Permitted in OR Office/Research, CM general manufacturing, and LM Limited Industrial/Research Park district. In Planned Community District depending on specific provisions.
San Jose	Permitted in IP Industrial Park Zoning Districts only (not even conditionally in Light or Heavy Industrial Zoning Districts)--"We see need to protect our light and heavy industrial districts"(Andrew Crabtree).

Source: OLA Survey, January 2002

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## APPENDIX VIII - BIOSCIENCE USE AND POTENTIAL IMPACTS MATRIX

Bioscience Use & Potential Impacts Matrix September 28, 2004 draft	Regulatory Authority/ Code Sections/ Guidelines
Environmental Concerns	SFHMUPA/ SFHC(1), NIH(1), CDC(1,2), Cal OSHA/CCR(2), DHHS(1), SFDCP
BioHazard 4 Organisms	SFHMUPA/ SFHC(1), NIH(1), CDC(1,2), Cal OSHA/CCR(2), DHHS(1), SFDCP
BioHazard 3 Organisms	SFHMUPA/ SFHC(1), NIH(1), CDC(1,2), Cal OSHA/CCR(2), DHHS(1), SFDCP
BioHazard 2 Organisms	SFHMUPA/ SFHC(1), NIH(1), CDC(1,2), Cal OSHA/CCR(2), DHHS(1), SFDCP
Storage and use of Highly Toxic, Reactive, and Corrosive Materials	SFHMUPA/ SFHC(1) , Cal OSHA/ CCR(1)
Storage and use of Flammable and Combustible Liquids	SFHMUPA/ SFHC(1), SFFD/SFFC(3)
Abatement Systems Hazards (breakthrough)	SFHMUPA, SFFD, Cal OSHA
Storage and use of High Pressure Hydrogen	SFHMUPA/ SFHC(1), SFFD/ SFFC(1), Cal OSHA/ CCR(3)
Utilization of Reducing Acid gases in Reduction Experiments	SFHMUPA/ SFHC(1), SFFD SFFC(1,2,4), Cal OSHA/ CCR(3)
<b>Bioscience Uses**</b>	
<b>Research Labs</b>	
Biology Lab (BSL1)	
Biology Lab (BSL2)	
Biology Lab (BSL3)	
Biology Lab (BSL4)	
Biochemical Lab	
Analytical Chemistry Lab	
Combinatorial Chemistry Lab	
Chromatography	
Hydrogenation Lab	
High Throughput Screening	
High Performance Liquid Chromatography	
Robotics Lab	
Engineering Lab	
Nuclear Magnetic Resonance (NMR)Lab	
Vivarium	
Animal Facilities	

Bioscience Use & Potential Impacts Matrix September 28, 2004 draft	Regulatory Authority/ Code Sections/ Guidelines	
	Environmental Concerns	
<b>Bioscience Uses**</b>		
<b>Manufacturing</b>		
Biotech Kilo Lab	BioHazard 4 Organisms	SFHMUPA/ SFHC(1), NIH(1), CDC(1,2), Cal OSHA/CCR(2), DHHS(1), SFDCP
Biotech Pilot Mfg	BioHazard 3 Organisms	SFHMUPA/ SFHC(1), NIH(1), CDC(1,2), Cal OSHA/CCR(2), DHHS(1), SFDCP
Biotech Mfg	BioHazard 2 Organisms	SFHMUPA/ SFHC(1), NIH(1), CDC(1,2), Cal OSHA/CCR(2), DHHS(1), SFDCP
Pharmaceutical Kilo Lab	Storage and use of Highly Toxic, Toxic, Reactive, and Corrosive Materials	SFHMUPA/ SFHC(1), Cal OSHA/ CCR(1)
Pharmaceutical Pilot Mfg	Storage and use of Flammable and Combustible Liquids	SFHMUPA/ SFHC(1), SFFD/SFFC(3)
Pharmaceutical Mfg	Abatement Systems Hazards (breakthrough)	SFHMUPA, SFFD, Cal OSHA
<b>Offices</b>	Storage and use of High Pressure Hydrogen	SFHMUPA/ SFHC(1), SFFD/ SFFC(1), Cal OSHA/ CCR(3)
BioInformatics	Utilization of Reducing Acid gases in Reduction Experiments	SFHMUPA/ SFHC(1), SFFD SFFC(1,2,4), Cal OSHA/ CCR(3)
Computational Science		
Data Center		
Imaging (MRI)		
<b>Warehousing/Distribution</b>		
Warehouse		
Cold Storage		
Freezer Storage		
<b>Vendors</b>		

Bioscience Use & Potential Impacts Matrix September 28, 2004 draft	Regulatory Authority/ Code Sections/ Guidelines	SFHMUPA/ SFHC(1), CDHS Radiologic Health Branch/ CCR(4),	SFHMUPA/ SFHC(3)	SFHMUPA/ SFHC(2)	SFHMUPA/ SFHC(1), SFFD/ SFFC(1)	BAAQMD/ Constituent specific Rules/ Regulations	SFHMUPA/ SFHC(1), SFPUC(1)	SFHMUPA, CDHS Radiologic Health Branch	SFPUC	PG&E	BAAQMD	SFPD	SFPD
	Environmental Concerns	Utilization of Ionizing Radiation and Isotopes	Bio Hazard Waste	Flammable Liquid Waste	Flammable Gases	Toxic or Highly Toxic air discharge	Toxic or highly toxic liquid waste discharge	Nuclear Waste	Water usage	Power usage	Noxious exhaust	Security	Noise
<b>Bioscience Uses**</b>													
<b>Research Labs</b>													
Biology Lab (BSL1)													
Biology Lab (BSL2)													
Biology Lab (BSL3)													
Biology Lab (BSL4)													
Biochemical Lab													
Analytical Chemistry Lab													
Combinatorial Chemistry Lab													
Chromatography													
Hydrogenation Lab													
High Throughput Screening													
High Performance Liquid Chromatography													
Robotics Lab													
Engineering Lab													
Nuclear Magnetic Resonance (NMR)Lab													
Vivarium													
Animal Facilities													



Bioscience Use & Potential Impacts Matrix September 28, 2004 draft	Regulatory Authority/ Code Sections/ Guidelines	SFHMUPA/ SFHC(1), CDHS Radiologic Health Branch/ CCR(4),	SFHMUPA/ SFHC(3)	SFHMUPA/ SFHC(2)	SFHMUPA/ SFHC(1), SFFD/ SFFC(1)	BAAQMD/ Constituent specific Rules/ Regulations	SFHMUPA/ SFHC(1), SFPUC(1)	SFHMUPA, CDHS Radiologic Health Branch	SFPUC	PG&E	BAAQMD	SFPD	SFPD
	Environmental Concerns	Utilization of Ionizing Radiation and Isotopes	Bio Hazard Waste	Flammable Liquid Waste	Flammable Gases	Toxic or Highly Toxic air discharge	Toxic or highly toxic liquid waste discharge	Nuclear Waste	Water usage	Power usage	Noxious exhaust	Security	Noise
<b>Bioscience Uses**</b>													
<b>Manufacturing</b>													
Biotech Kilo Lab													
Biotech Pilot Mfg													
Biotech Mfg													
Pharmaceutical Kilo Lab													
Pharmaceutical Pilot Mfg													
Pharmaceutical Mfg													
<b>Offices</b>													
Bioinformatics													
Computational Science													
Data Center													
Imaging (MRI)													
<b>Warehousing/Distribution</b>													
Warehouse													
Cold Storage													
Freezer Storage													
<b>Vendors</b>													

## **KEY - BIOSCIENCE USE AND POTENTIAL IMPACTS MATRIX**

### **Potential Level of Impact**

5: high volume required/ high frequency of occurrences/ high number of transactions  
4: moderate volume required/ lower frequency of occurrences/ moderate number of transactions  
3: small volume required/ occasional occurrences/ low number of transactions  
2: potential requirement/ rare occurrence/ very few transactions  
1: no requirement/ unlikely to occur/ no provision for transactions  
0: not applicable

### **Regulatory Authorities**

**SFHUPA:** San Francisco Hazardous Materials Unified Program  
**NIH:** National Institutes of Health  
**CDC:** Center for Disease Control and Prevention  
**Cal OSHA:** California Occupational Safety and Health Administration  
**DHHS:** Department of Health and Human Services  
**SFFD:** San Francisco Fire Department  
**CDHS:** California Department of Health Services  
**BAAQMD:** Bay Area Air Quality Management District  
**U.S.D.O.T.:** United States Department of Transportation  
**SFDPH:** San Francisco Department of Public Health

### **Regulatory Codes:**

**CEQA:** California Environmental Quality Act  
**SFHC (1):** San Francisco Health Code, Article 21: Hazardous Materials Management  
**SFHC (2):** San Francisco Health Code, Article 22: Hazardous Waste Management  
**SFHC (3):** San Francisco Health Code, Article 25: Medical Waste Management  
**SFFC (1):** San Francisco Fire Code, Article 74, Compressed Gases  
**SFFC (2):** San Francisco Fire Code, Article 75, Cryogenic Gases  
**SFFC (3):** San Francisco Fire Code, Article 79, Flammable and Combustible Liquids  
**SFFC (4):** San Francisco Fire Code, Article 80, Hazardous Materials  
**SFPWC (1):** San Francisco Public Works Code, Article 4.1, Industrial Waste  
**CFR (1):** Code of Federal Regulations, Title 40  
**CCR (1):** California Code of Regulations, Title 8, Section 5191  
**CCR (2):** California Code of Regulations, Title 8, Section 5193  
**CCR (3):** California Code of Regulations, Title 8, Division 1, Chapter 4  
**CCR (4):** California Code of Regulations, Title 17

### **Regulatory Guidelines:**

**NIH (1):** Guidelines for Research Involving Recombinant DNA Molecules  
**CDC (1):** Guidelines on Biosafety in Microbiological and Biomedical Laboratories  
**CDC (2):** Packaging, Shipment and Transportation Requirements for Infectious Substances  
**DHHS (1):** Requirements for Facilities Transferring or Receiving Select Agents

## **IX - ZONING ADMINISTRATOR BULLETIN**

**Subject:** Research and development facilities, location

**Effective Date:** 4/88 Zoning Bulletin dated 4/26/88

### **Interpretation:**

This subsection describes where light manufacturing, industrial or chemical research or testing laboratory or experimental laboratory are allowed in the C and M Districts. A zoning bulletin dated 4/26/88 describes the various types of activities that could be involved in a research and development facility and goes on to explain which types can be permitted or conditional uses in the C-3, C-M, M-1, M-2 and proposed SOMA Districts. (See Appendix with this subsection designation.) Uses not open to the public are not allowed in NC Districts.

### **ZONING BULLETIN**

**April 26, 1988**

Planning Code Section 226(d), 226(e) and 226(f)

### **RESEARCH AND DEVELOPMENT FACILITIES PERMITTED IN C-3, C-M, M-1 and M-2 ZONING DISTRICTS**

**Purpose:** This bulletin is to clarify within which zoning districts Research and Redevelopment (R & D) facilities are permitted. A Research and Development facility has as its primary purpose scientific or technical research and development activities, including by way of example:

- 1) Computer and communication equipment and facilities;
- 2) Research and testing, equipment and facilities;
- 3) Research laboratories support and related materials, equipment and support facilities;
- 4) Libraries, archives, data storage and retrieval equipment and facilities;
- 5) Limited manufacturing and production facilities and equipment ancillary to primary research and development activities;
- 6) Support services and activities, such as maintenance, repair and storage, facilities and equipment;
- 7) Administration and record keeping services needed for management of research and development and ancillary activities;
- 8) Conference, meeting, instructional and training facilities and equipment.

**Code Provision:** Code Section 226 (d) permits light manufacturing with certain exceptions as a principal use in M-1 and M-2 zoning districts.

Code Section 226 (e) permits an industrial or chemical research or testing laboratory, not involving any danger of explosions as a principal use in C-3, C-M, M-1 and M-2 zoning districts.

Code Section 226 (f) permits an experimental laboratory as a conditional use in C-3-S and C-M zoning districts and as a principal use in M-1 and M-2 zoning districts.

**Determination:** All aspects of a Research and Development facility may be permitted as a principal use in M-1 and M-2 zoning districts. An R & D facility which does not involve any danger of explosions and does not include manufacturing and production facilities may be permitted as a principal use in C-

3. C-M, M-1 and M-2 zoning districts. An R & D facility involving explosives may be authorized as a conditional use in C-3-S and C-M zoning districts. An R & D facility involving manufacturing and production limited as provided by Code Section 226 (a) and (b) also may be permitted as principal uses in C-3 and C-M zoning districts.

All floor area within such a Research and Development facility shall be considered to be used for Research and Development activities, and not for separate functions such as educational, manufacturing, office or storage use.

***Determination Within Proposed South of Market Zoning Districts:***

M-1 and M-2 districts in the South of Market Area are proposed to be rezoned to HSL (Housing/Service Light Industrial), SLJ (Service/Light Industrial) and SSO (Service/ Secondary Office) zoning districts. In these districts, light industrial is proposed to be listed as a use which would include light manufacturing/industrial or chemical research/ testing laboratory not involving any danger of explosions. Light industrial is permitted as a principal use in the three South of Market zoning districts cited above, and also permitted as a principal use in the RHD (Residential Hotel) and SPD (South Park) South of Market zoning districts.

Robert W. Passmore

Assistant Director of Planning Implementation

(Zoning Administrator)

## **APPENDIX X - PROPOSED BIOSAFETY MANAGEMENT PLAN**

### **Components of a Biosafety Management Plan**

- A certification that operations involving biohazards are performed in conformance with the National Institutes of Health "Guidelines for Research involving Recombinant DNA Molecules" and the Centers for Disease Control "Biosafety in Microbiological and Biomedical Laboratories" (BMBL).
- Roles and Responsibilities
- List of Projects that involve biohazards
  - Project Description
  - Expected Start Date
  - Expected End Date
  - PI Name
  - PI Phone #
- Biohazard Inventory
  - Name of organism or specific biohazard
  - Risk Group #
  - Name of Project
  - Quantity
- Containment Methods
- Decontamination Methods
- Sterilization Methods
- Spill Response
- Medical Surveillance
- Incident Reporting
- Employee Training
- Biosafety Committee
  - Members
  - Meeting Schedule
  - Retain minutes on site for a specified number of years
- Name of Person responsible for biosafety compliance
  - Qualifications (Include CV)
  - Phone #
- Name of at least 2 persons responsible for peer review of Biosafety Management Plan