VII. Action Plan

There is a noticeable drop in enrollment, master sections offered and total number of (FTEF), however our productivity remained essentially constant. In Fall 2009, we had one of the largest course offerings the chemistry department has ever had. Due to budget cuts, we had to reduce our offering by ~22%. When budgets stabilize and then return to Fall 2009 levels, the department will increase the number laboratory and lecture sections. In terms of productivity, the more labs that we can offer, the better our productivity. However there is a limit. In Fall 2009 the department was very near the maximum possible enrollment in the chemical laboratories due to space limitations, particularly for Chem 30A/30B and 1A/B.

This Fall 2010 the Laney campus reestablished, revised, and posted in plain view room occupancy limits, which are safety regulations mandated by the Fire Marshall. The direct effect on the Chemistry Department is that most all of our Chem 30A/30B and Chem 1A/1B course offerings in the traditionally assigned classrooms (right outside the chemical laboratories) will have reduce maximum enrollment numbers – we will have to reduce our class sizes to adhere to the new room occupancy limits. For the first time the size of the lecture hall will be limiting our enrollment, whereas in the past the laboratory space was the main consideration. We need more space to safely offer instruction to more students.

Another issue of potential concern to our enrollment is the pending American Disabilities Act (ADA) mandated renovation that is ongoing at Laney and is slated to convert ~15% of our current student laboratory benches to ADA compliant benches and is expected to be completed by early Spring 2011. Although the renovation as a whole is a necessary part of creating access to our campus for students with ADA needs, the current design for the chemistry laboratory benches threatens to render them with limited utility to both ADA and non-ADA students. Currently the department and the district are attempting to negotiate the design of these workspaces to make them more useful to all types of students at all times. If a partial re-design of these workstations based on the original plans (which the department had not input on) is not permitted then we will likely have to reduce our total enrollment in the chemistry laboratories by ~30 students (about 7% of our Fall 2010 census enrollment) until we gain access to a new science building.

The Chemistry Department curriculum is current and effective. We use current textbooks (updated with new information approximately every 3 years) to ensure our curriculum is up-to-date. All of the course outlines for chemistry classes were updated in Spring 2004, with the agreement of all of the other Chemistry departments in the district. We plan to update our course outlines this Fall 2010 and to include student learning outcomes (SLOs) for each class that has them (all of them). We also plan to validate the prerequisites for each course. Two of our course outlines have already been updated and are current – Chem 30A and Chem 25, however the SLO's have not been added yet.

In terms of pedagogy our instructors use different teaching methods. Among the methods used are:

- testing frequently to give students ample feedback. (some of the tests are standardized ones from the American Chemical Society and come with statistical norms that can be used to gauge effectiveness in the classroom)
- interactive class sessions, where instructors constantly solicit feedback and dialogue with the students
- peer learning workshops in class where students participate in group problem solving sessions with the assistance of the instructor.
- workshops with guided feedback on how to write lab reports effectively.
- use of web-based chemistry problems sets

Some instructors have set up class websites where students can access handouts, sample exams and review problems, and other information. The district is in transition to a new platform that ultimately should make resources for both students and faculty more readily available and easier to implement. The department has already begun development of the new Chemistry website, which will contain a faculty-only resource page and a blog space for chemistry students to interact with chemistry faculty.

Since our classes are relatively small, we are able to have plenty of personal contact with the students, especially during the laboratory periods, and are able to gauge their progress. Most of our current lecture instructors also teach the laboratory portion of their course as well.

We make sure to cover topics required for the MCAT and the American Chemical Society (ACS) standardized exams. Although these tests are officially multiple-choice exams, and we typically discourage the use of these type of test for grading purposes, the test results can be used effectively for assessment purposes. They also give students practical experience in taking standardized exams, which they will inevitable do if they continue in science and/or health-related fields. Currently, the ACS Organic Chemistry exam is given as the final exam at the end of the Organic Chemistry sequence (Chem 12A/12B) and ACS General Chemistry test is used as part of the final exam for General Chemistry (Chem 1B). Starting in Fall 2009, we began a systematic inquiry into the use of the ACS exams for other classes (Chem 1A/B and Chem 30A/B) as well, not only for assessment purposes, but as a means to measure the level of our academic standards. It is projected that by Spring 2011 we will be using ACS exams as an assessment tool in some way for nearly all of our courses.

IX. Faculty needs:

The chemistry department has three full-time tenured instructors and over the last three years has employed between 9 and 11 part-time instructors each semester. Each year our summer program is covered by 6 to 7 part-time instructors. Over the last three years our teaching load has been 7.5 to 8.5 FTE.

We need two (2) new full-time instructors, since currently only about 36% of our classes are taught by full-time instructors (based on equated hours)! Two additional full-time

instructors would provide the quality and continuity to students that they deserve and would decrease our dependence on part-time instructors. Part-time instructors, by the nature of their employment, could leave after any semester. To maintain continuity and for future planning and viability of the department we require committed and dedicated faculty. Only, by employing them full-time can we be assured that they will strive to further the goals of the department and the college. Additional full-time instructors would also share in the many aspects of running the department, participate in the shared governance on campus, and would provide the diversity of a well-staffed department.

IX. Classified needs:

As of Fall 2009 the Chemistry and Physics/Astronomy departments had a combined total or 2.5 laboratory technicians (two at 1.0 and one at 0.5). The Chemistry department effectively utilized 2.0 technicians and the Physics/Astronomy department utilized 0.5. By Spring 2009 one full-time technician retired (Subash Basho) and the other full-time technician (Amare Gebre) left suddenly on medical leave and eventually retired mid-semester. In response to our sudden reduction in staffing for the chemistry and physics laboratories, the district approved the conversion of the half-time position to full-time, so now Seth Silberman is our single laboratory technician. In the meantime, the college and the district have approved the temporary hire of part-time temporary staff to assist in the necessary tasks of running the chemistry and physics department laboratories and the chemical and equipment stockrooms.

During the last department chair elections, the Chemistry, Physics and Astronomy departments voted unanimously to combine into a science cluster starting with the 2010-2011 school year. This move offers a greater level of efficiency to the classified staffing of these departments, whereby tasks and financial resources can be shared more effectively. What remains is the hiring of a second full-time 12-month contracted laboratory technician.

Our current laboratory technician, Seth Silberman, has been an outstandingly efficient employee, who stepped up to the tremendous job of taking over the chemistry and physics department duties in place of both of the recently retired staff who, combined had many years of experience in the daily operations of running of these departments. With the assistance of a specially appointed faculty member in Spring 2010, we were able to bring some stability to the laboratory program. In addition, we were exceedingly fortunate to have found a temporary part-time laboratory technician near the end of the Spring 2010 semester, who has industrial laboratory experience.

In late Summer 2010 the college and the district approved the hire of a second full-time laboratory technician position. The job posting has already been published, the deadline has passed, applications have been received, and the initial screening of applicants and final formation of a hiring committee are currently underway. *We recommend the expedient completion of this hiring process.*

However, the current expertise and training of our laboratory technicians is not sufficient to enable our stockrooms and laboratories to operate safely within CalOSHA or Fire Marshall regulations. The primary reason for this stems from the low level of qualifications that were required of the previously advertised laboratory positions in the first place (attempts by the department to require such qualifications were ultimately thwarted by the Human Resources department). The qualifications for the position hardly required any chemistry background or laboratory safety training. In fact the only firm requirement was a semester's worth of a college-level laboratory course in any science. (Fortunately, the most recent job posting addressed these short-comings)

Since the chemistry and physics department faculty, the college, and the district rely on laboratory technicians to operate within currently acceptable safety guidelines that are subject to strict adherence to accepted safety practices the district is ultimately obliged and required to train its staff in the correct use, handling, and storage of chemicals and equipment, and in the safety standards and procedures that will provide a safe working environment.

In the past, the general lack of appropriate chemical expertise and training was evident and contributed to unsafe reagent storage situations, poor quality laboratory preparations and presentations of student laboratory experiments (which sometimes are completely incorrect), and unsafe chemical handling operations. *We recommend instituting a regular series of training programs and assessments for our laboratory technicians to ensure their proficiency in these areas*.

IX. Student Assistants needs:

We can improve retention, without compromising academic standards, by offering tutoring and study groups through the chemistry department. Currently, we hire hand-picked tutors and offer free tutoring to students – using our department allocated budget for teaching assistants. We would like our budget for student aides/tutors to be increased. Over the last four years we have incrementally strengthened our tutoring program by having as many five tutors available each week to help with each of our classes. In Spring 2010 we had to cut our tutoring budget by nearly 50% and now in Fall 2010 the budgeted amount was no more than last Spring. Our experience is that the more tutors we hire or the more time we appoint to a tutor, the more the tutoring program is utilized. We know this from the records we keep on who comes in for tutoring (they have to sign in to receive any help).

We have found that former chemistry students hired as student aides or teacher assistants can be of tremendous assistance to the instructor and the class in lecture and laboratory. Furthermore, the student gains invaluable experience with chemistry – the best learning comes from telling someone else about the subject or by being continually exposed to the topics. In this way, students that we pick for tutoring or assistants become mentors. This Fall 2010 the department only had tutors available – we would also like to have teacher assistants as well.

Over the last four years we have offered free chemistry tutoring through the use of department funds. We had initially incrementally increased the funding and availability of free chemistry tutors and by Fall 2009 we had the greatest number of tutoring hours and students served to date, however by spring 2010 and in fall 2010, due to budget cuts, we had to reduce the number of hours offered. Recently, we have aligned our tutoring efforts with the campus-wide tutoring programs facilitated by Lisa Cook. It's uncertain how to maintain the level of tutoring that we offered in Fall 2009 in this context, however, we would like any budgeted amount toward tutors to be increased, and we would like to know in advance how much money we will have for the year so that we can plan effectively. *We are requesting a fiscal budget of at least $10,000 for both teacher assistants/aides and tutors combined*.

IX. Equipment, Material, and Supply needs:

The chemistry department supplies budget should be substantially increased. The criterion for the allocation of and the actual value of the allocated budget have never been made clear to the chemistry department staff. Therefore planning the purchase of the chemicals and supplies required for the chemistry laboratory program has always been hampered by the lack in knowledge of available resources. The chemistry department supplies budget is used to replenish consumable supplies, reagents for laboratory experiments, and for replacement of broken glassware equipment. *We need an annual budget of $25,000 to cover these expenses.* Anything less and we have to cut back on the amount and type of experiments that can be performed.

The chemistry department needs at least three more overhead projectors (PowerPoint projectors) and laptop computers to increase the technology used in the classroom.

IX. Facilities needs:

We need more space for chemistry student to study chemistry. We need a study hall with computers and tutorial programs with which students can use to study and review chemistry and with software for drawing and visualizing chemical structures and for accessing information. We need a place where molecular models and visual aids are available to help students conceptualize the objectives of each course. *We need a new science building!*

We also need lecture halls large enough to accommodate all of our students, ones in which we can give tests with out worrying about cheating, but are intimate enough to support learning. Our classrooms are inadequately designed to do demonstrations and are too small to hold the number of students that enroll every semester. Our lecture halls are usually overcrowded beyond the maximum allowed by the Fire Marshall (see above discussion in Action Plan). *We need a new science building!*

Over the last four years we have purchased a fair amount of needed equipment through

Measure A funds. Much of it has been installed and is being used by students and instructors. This has greatly improved our program, since students can now gain hands-on experience on equipment that they will undoubtedly use again later in their education or in industry. However, there is more equipment to install, which will require some updating of electrical circuits and plumbing and Internet connections.

Students need computer access. Increasingly, students are required to make use of the resources on the Internet to find and decipher chemistry information – especially for laboratory, to employ chemistry modeling programs to predict and analyze chemical properties, and to analyze data from laboratory experiments. The department purchased several computers for student use with Measure A funds, however we have a serious lack of available space to install them for general use and a lack of computer IT support to set them up – the district has policies regarding setting up and maintaining computers, but not enough staff to implement them (only one IT staff currently at Laney). *We need more support from the college and district to setup and maintain computers in our department. We also need the physical space to setup the computers.* Another reason for a new science building.

The two attached documents (below) were discussed in our Spring 2010 Program Review and have been circulated to various administrative personnel over the past year. These items have not been adequately addressed so they are included in this update for review. Many facility issues are discussed in these lists.

Chemistry Department Renovations and Updates – Fall 2010

Below is a list of items that has already been circulated at Laney College, through the Business Office, the Office of Instruction, and the Peralta General Services office, but have gone essentially unaddressed.

Floors in Stockrooms are Incomplete
The floors of the chemical stockrooms A235B and A279 and the equipment storage rooms A235C and A278 were never completed during the 2007 renovation. The floors were supposed to be fitted with a chemical resistant flooring with splash-resistant covebase installed along the walls and cabinet bases. The reason for installing the special type of flooring stemmed from the original OSHA citation of a lack of spill containment measures in the chemical stockrooms. This issue has still not been resolved, so we are still not in compliance with this OSHA regulation and could easily be cited for the same issue.

Dishwashers Need Replacing
The glassware dishwashers installed in rooms A235B and A278 by Hung Constructions during the 2007 renovation are the incorrect type and are unusable. Additionally, the one installed in A278 has a slow water leak that continues to this day to fill the bottom of the washer and leak on to the floor. It has been noted numerous times to the business manager and to the project managers for Hung construction, and 1701 Associates, that the type and model of these dishwashers was incorrect from the beginning and that they needed to replaced with appropriate washers for chemical glassware. We have to date not been able to make use of either install dishwasher.

More Safety Signs Need Posting
Many of the safety and information signs in the Chemistry department that were removed during the renovation, particularly by whoever performed the painting, were not adequately re-installed. Recently, there has been a program implemented to increase the signage on our laboratory and stockroom doors, however the signs for safety equipment such as eye-wash stations and chemical wash showers are either missing or are sitting on the floor where they were left three years ago.

Lack of Certification or Compliance with OSHA/CalOSHA
The Chemistry department facilities has still not undergone any type of rigorous evaluation of compliance with OSHA/CalOSHA regulations or Fire Marshall regulations since the renovations of the stockrooms and laboratories. We have repeatedly asked for an independent agency or consultant that is well-versed in the current regulations regarding science laboratories to assess and advise us regarding our facilities. From the public record, it should be known that the original OSHA violations were reported by a concerned faculty member because the school and the district failed to respond to reports of unsafe conditions in the stockrooms and laboratories. (In fact, the faculty member sent several advanced warnings to the administration that OSHA might need to be notified if the administration neglected the situation. They did, so OSHA was notified.)

Chemical Safety Shower Curtain is Hazardous
The chemical wash shower "modesty curtain" in A278 doesn't hang properly and partially blocks the exit door to the outside and the emergency gas shutoff valve. This is a safety hazard.

Class D Fire Extinguishers are Unavailable
The chemical stockrooms A235B/C and A279 both require a Class D (metals) fire extinguisher, since both stockrooms maintain stores of flammable metals and thus require a Class D fire extinguisher. Also, since these metals are used for routine chemistry experiments where they are performed this type of extinguisher must be available in locations that are close to where these experiments are performed in the event of an accident. Years of repeated requests have been ignored by the college and administration. This is a serious safety violation that has been ignored by all levels of the administration at the college and the district.

Still Need Another Storage Cabinet
The department still needs one more chemical storage cabinet in room A278. The corrosive storage cabinet in A278 is old, corroded, and doesn't close properly, so it needs replacing. Also, it needs to be vented and attached to the fume hood exhaust plume.

Chalkboards were removed and never replaced
Every year since the renovation of the lecture and laboratory rooms around the chemistry department (summer 2007), the chemistry faculty have voiced our unanimous opinion about having regular chalkboards in our lecture and laboratory rooms rather than white boards. A major issue regarding the use of white boards is that the markers used for white boards, as well as the provided board cleaners, contain volatile solvents and chemicals that are far worse for the environment and much worse for our health than simple chalk (many solutions exist to minimize chalk dust, which is the most common complaint about chalk). The long-term health issues associated with the inhalation of these vapors are unknown. Also, since these markers usually run out of ink fairly quickly and are discarded in the trash they are incredibly wasteful and end up in a landfill. The use of these markers runs counter to the principles espoused by Sustainable Peralta – our new environmental initiative. Goal three of the Sustainable Peralta states: "Model facilities and resource management, including recycling and waste management, energy reduction and generation projects, water conservation programs, *environmentally preferred purchasing*, and *environmentally sustainable programs for remodeling, renovating* and constructing our physical plant."

In response to our preference for regular chalkboards, the school did provide portable chalkboards, which were distributed throughout our lecture and laboratory rooms. However, these are simply not appropriate replacements for the "old" chalkboards and do not easily fit in the lecture and laboratory space, in particular in the laboratories where they represent a safety hazard. We recommend that the school installs multi-panel chalkboard-whiteboard combination boards (ones that slide back and forth) so that both types of boards are available to instructors, and that do not take up extra floor space. This would offer greater flexibility for instructors to deliver course material.

The case for a new Science Building – Fall 2010

Our storage and safety issues can not be addressed adequately by just remodeling our current building, and remodeling will not accommodate the growth we expect in the department. We feel a new science building would most effectively address all of our needs, and also address needs of other departments in our division. Chemistry needs additional lab and lecture space. Our students would benefit from a specialized room for open labs and tutoring, as well as access to computers. The following five points summarize the need for a new science building:

1. Health and safety issues
Current facilities do not meet OSHA standards (chemical storage and earthquake safety) or ADA requirements (disabled students have difficulties working in lab rooms), and all rooms need better environmental control and ventilation. Ventilation is always an issue of a comfortable and effective learning environment, and often an issue of potential exposure to chemical fumes. Additionally, instructors have concerns that hazardous materials used in the construction of our old buildings are affecting their long-term health.

2. Align with goals of Sustainable Peralta
A new building that is LEED certified is in line with Sustainable Peralta goals. The building could meet the goals not only in terms of energy efficiency and overall compatibility with the environment, but also in curriculum development. The sciences are a natural fit with sustainable curriculum.

3. Support current enrollment and allow for growth
Current facilities do not allow us to adequately support the students we have enrolled. Over-filled classrooms create many problems that affect student learning as well as safety. We clearly have enough students to support opening more sections, if more space was available.

4. Remain competitive in sciences in the Bay Area
Several colleges in the Bay Area have new science buildings either already constructed or currently in progress. Students will be drawn to state-of-the-art facilities, and all of Laney College will benefit.

5. Increased efficiency in operating departments
Science departments use similar equipment and supplies, and some things could be shared if we were located near one another. It is common for students to be taking courses in two or more of our departments during one semester, and the new building would be ideal to bring students together in a way that enhances their interaction with one another and with faculty. Communication among faculty would also be strongly enhanced. The Chemistry, Physics and Biology Departments would be entirely relocating to the new facility, and Math and CIS would have additional classroom and office space to add to their current facilities.