California State Auditor

April 2018

California State University

It Has Not Provided Adequate Oversight of the Safety of Employees and Students Who Work With Hazardous Materials

Report 2017-119

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April 24, 2018 2017-119

The Governor of California
President pro Tempore of the Senate
Speaker of the Assembly
State Capitol
Sacramento, California 95814

Dear Governor and Legislative Leaders:

As requested by the Joint Legislative Audit Committee, the California State Auditor presents this audit report regarding health and safety compliance by the California State University's (CSU) Chancellor's Office (Chancellor's Office) and at selected campuses, with an emphasis on laboratory health and safety

We found that the Chancellor's Office has failed to sufficiently oversee health and safety on campuses. For example, CSU's Office of Audit and Advisory Services has repeatedly recommended that the Chancellor's Office increase its oversight of the campuses' health and safety programs to address deficiencies in a number of areas, including employee and student health and safety training and inspections of laboratory safety equipment. However, we identified that some of these deficiencies have remained unresolved, indicating that the Chancellor's Office has not taken the necessary steps to hold the campuses accountable. Further, the Chancellor's Office has not ensured that the campuses report critical information regarding their health and safety programs. The failure on the part of the Chancellor's Office to provide strong oversight increases health and safety risks for employees and students in the CSU system.

We also found that the four campuses we reviewed did not consistently comply with requirements related to the oversight of health and safety policies, training, and the inspection of laboratory safety equipment. None of the four campuses could demonstrate that they consistently conducted required annual reviews of policies that are critical to ensure the safety of employees who work with hazardous chemicals. Further, the four campuses have not always ensured that their employees received all required safety trainings as frequently as either state regulations or their policies require. Similarly, the four campuses could not demonstrate that they provided students with training related to health and safety before they began working in laboratory environments. Three of the four campuses we reviewed did not conduct required inspections of critical laboratory safety equipment and therefore have less assurance that the equipment would function properly in an emergency. Without resolving these issues, campuses cannot ensure they are effectively protecting students and employees against injuries and illnesses.

Respectfully submitted,

Elaine M. Howle

ELAINE M. HOWLE, CPA
State Auditor

Selected Abbreviations Used in This Report

EH&S	environmental health and safety
HVAC	heating, ventilating, and air conditioning
PPE	personal protective equipment

Contents

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Summary

Results in Brief

The California State University (CSU) Chancellor's Office (Chancellor's Office) has not provided effective leadership to ensure that its campuses address health and safety concerns related to the presence of hazardous materials. CSU is subject to a number of state laws and regulations to ensure the safety of CSU employees who encounter hazardous materials in laboratory or other work settings. Nonetheless, the Chancellor's Office has not actively ensured that campuses have adequate policies and processes to protect the health and safety of those who work with or near hazardous materials. For example, the Chancellor's Office has not ensured that campuses consistently submit required annual reports regarding their health and safety programs, even though the reports are critical to its oversight efforts. Further, it has not ensured that when campuses submit these reports, they include information that would enable the Chancellor's Office to identify risks to employees and students. CSU's Office of Audit and Advisory Services (University Auditor) has repeatedly recommended that the Chancellor's Office increase its oversight of the campuses' health and safety programs, particularly as it relates to employee and student health and safety training and inspections of laboratory safety equipment and workplace hazards the campuses conduct. Despite the fact that many of these deficiencies have remained unresolved for nearly two decades, the Chancellor's Office has not taken the steps necessary to hold the campuses accountable.

Further, neither the Chancellor's Office nor the four campuses we reviewed—California State University Channel Islands (Channel Islands); California State University, Sacramento (Sacramento); San Diego State University (San Diego); and Sonoma State University (Sonoma)—ensured that they had critical committees to discuss safety concerns during our review period from July 1, 2014, through June 30, 2017. Specifically, despite the requirements in its agreement with one of its unions, the Chancellor's Office does not currently have a systemwide joint safety committee that enables management and staff to work together to recommend safety regulations, guidelines, training programs, and necessary corrective actions related to maintaining safe working conditions. Additionally, the four campuses do not have similar campuswide committees.

State regulations require that any campus engaged in the laboratory use of hazardous chemicals have a chemical hygiene plan (chemical plan), which specifies the operating procedures that laboratory workers must follow when using hazardous chemicals.

Audit Highlights . . .

Our review of the health and safety compliance of the CSU Chancellor's Office and four campuses highlighted the following:

» *The Chancellor's Office:*

- *Has not ensured that campuses have adequate policies and processes to protect the health and safety of those who work with or near hazardous materials.*
- *Has not increased its oversight of the campuses' health and safety programs and addressed deficiencies in a number of areas as repeatedly recommended by the University Auditor.*
- *Does not currently have a systemwide joint safety committee that enables management and staff to work together on safety issues.*

» *Of the four campuses we reviewed:*

- *None have campuswide joint safety committees.*
- *None were able to provide evidence that they reviewed their chemical plans annually.*
- *Each failed to ensure that all relevant employees received required trainings, including those related to laboratory safety and the disposal of hazardous waste.*
- *All could not always demonstrate that they provided students with training related to health and safety before they began working in laboratory environments.*
- *Some failed to adequately monitor key safety equipment to ensure that it was in proper working condition.*
- *Some did not properly notify employees regarding rooms that contained asbestos.*

Although Sacramento's and Sonoma's chemical plans require their campuses to have committees to assist in evaluating the effectiveness of those chemical plans, neither campus has ensured that its committee meets regularly and discusses chemical usage policies and usage. Further, state regulations require that the campuses evaluate their plans annually for effectiveness and update them as necessary. Although all four campuses have established chemical plans, none could provide evidence that they had reviewed their chemical plans annually to determine their effectiveness. Considering that Sonoma has not updated its plan for six years and Sacramento has not substantially updated its chemical plan for 15 years, the lack of documented reviews of their plans' effectiveness is especially troubling.

The campuses have also not ensured that all employees receive required safety trainings. State regulations require that employers provide certain trainings to employees to ensure their safety and well-being when working with hazardous materials. However, each of the four campuses failed to ensure that all relevant employees received those required trainings, including those related to laboratory safety and the disposal of hazardous waste. Officials at the campuses offered different reasons for not ensuring compliance with required training. For example, Sonoma's Environmental Health and Safety (EH&S) director told us that due to limited resources, the EH&S office placed less focus on reviewing training records to verify employees consistently completed required safety training. By not ensuring that their employees are adequately trained, the four campuses have placed their employees and students at risk of injury from mismanagement of hazardous materials. Similarly, the four campuses could not always demonstrate that they provided students with training related to health and safety before they began working in laboratory environments.

Moreover, three of the four campuses we reviewed failed to adequately monitor key safety equipment to ensure that it was in proper working condition. Specifically, Sacramento, San Diego, and Sonoma did not always conduct regular inspections of the working conditions of critical safeguards—safety equipment such as fire extinguishers, emergency eyewashes, and showers designed to mitigate or prevent individuals' exposure to hazardous substances—as often as state regulations require. For example, according to state regulations, emergency eyewashes and showers must be activated at least monthly in order to verify they are operating properly, and fume hoods—which provide ventilation so employees and students can safely handle hazardous substances—must be inspected annually. However, only Channel Islands conducted the required inspections of all safeguards we reviewed. Sacramento, San Diego, and Sonoma each failed to routinely inspect all of the emergency

showers and eyewash stations monthly, and Sonoma failed to inspect any of the 17 fume hoods we selected for more than three years. As a result, these campuses lack assurance that this critical safety equipment will function properly to maintain the health and safety of their employees and students.

Finally, some of the four campuses we reviewed also increased the risks to employee health and safety by not properly notifying employees of rooms that contained asbestos. State law requires owners of buildings constructed before 1979, which include certain campus buildings, to notify employees working within those buildings about the presence of asbestos by providing both initial and annual notices to employees. State regulations require employers to post signs at the entrances of mechanical rooms that contain asbestos or material presumed to contain asbestos. However, Sacramento and San Diego did not always comply with the requirements to post warning signs at the entrance to mechanical rooms containing asbestos. When they fail to post required warning signs, the campuses increase the risk that their employees will expose themselves to asbestos, which can have significant health effects.

Selected Recommendations

Chancellor's Office

To more effectively monitor campus health and safety, the Chancellor's Office should develop a uniform health and safety reporting template by November 2018 and require the campuses to use it to annually report information related to campus health and safety, as well as to any other areas the Chancellor's Office considers critical to its oversight of health and safety compliance. The Chancellor's Office should also follow up with campuses that fail to submit the required annual health and safety reports and take appropriate steps to ensure compliance with this requirement.

To ensure that it identifies systemwide trends and makes appropriate recommendations to address health and safety issues, the Chancellor's Office should work with the appropriate union to form a systemwide joint committee, as agreed upon in its bargaining agreement with the union, by September 2018. It should also ensure that the systemwide joint committee meets and fulfills its responsibilities in accordance with the bargaining agreement by actively working with the union on an ongoing basis.

As part of the uniform health and safety reporting template, the Chancellor's Office should require campuses to annually report on the timeliness of their inspections of safeguards and to identify the reasons for any delays. The Chancellor's Office should follow up with campuses that report missed or delayed inspections and should require that the campuses develop action plans to ensure that they complete inspections as often as state regulations require.

To ensure compliance with state requirements to notify employees about the presence of asbestos, the Chancellor's Office should immediately remind all of its campuses that state regulations require posting signage by the entrances to mechanical rooms that contain asbestos. By September 2018, it should ensure that campuses are compliant with that requirement.

Campuses

To ensure that they receive feedback from employee representatives on conditions associated with their work environments and that they develop appropriate interventions, the four campuses should ensure that their joint committees meet and fulfill their responsibilities in accordance with the bargaining agreement. If such committees do not exist, they should work with the union to form them by September 2018. In addition, they should ensure that their joint committees record meeting minutes, and provide copies of the minutes and other information to the systemwide joint committee, as requested.

To increase oversight of chemical safety, Sacramento and Sonoma should specify by June 2018 how often their chemical committees are to meet and then ensure that their committees meet as frequently as required.

To more effectively provide oversight of their chemical plans, the four campuses should annually evaluate those chemical plans for effectiveness and document the results of those evaluations, including their discussions of any recommended revisions.

To ensure the health and safety of employees working with hazardous materials, Channel Islands, Sacramento, San Diego, and Sonoma should review by June 2018 the training records of all employees to identify those that have not taken required trainings. They should make the required trainings available to these employees and establish procedures for ensuring that the employees have received all required trainings.

Sacramento, San Diego, and Sonoma should implement plans to ensure that they consistently complete inspections of critical safety equipment in the time frames state regulations require.

Sacramento and San Diego should immediately ensure that the entrances to all mechanical rooms with asbestos or material presumed to contain asbestos have signage to inform employees about the presence of that hazardous substance.

Agency Comments

The Chancellor's Office provided a consolidated response in collaboration with the four campuses we reviewed, and generally agreed with our report's recommendations and stated that it has already begun taking steps to address many of them. However, it disagreed with our recommendation that campuses should ensure their joint committees meet and fulfill their responsibilities in accordance with the pertinent bargaining agreement.

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Introduction

Background

The California State University (CSU) is a public university system with 23 campuses located throughout the State. As of February 2018, CSU campuses employed more than 49,000 faculty and staff (employees) and enrolled about 479,000 students. The chancellor is CSU's chief executive officer and, through the Chancellor's Office, oversees the CSU campuses. The chancellor may delegate his or her authority through executive orders to others within CSU, including campus presidents, who are the chief executive officers of their respective campuses. Similarly, campus presidents may delegate their authority to other officials on their respective campuses. The campus presidents report to the chancellor and are required to keep him or her informed about the activities on their campuses.

All CSU campuses purchase hazardous materials for both instructional and research purposes, although colleges that focus on the sciences, fine arts, and liberal arts use hazardous materials more frequently. The use of hazardous materials on campus usually generates hazardous waste that is subject to strict regulations related to its safe and proper storage, transport, and disposal. Because laboratory, classroom, and stockroom settings within the campuses' chemistry, biology, physics, and art departments potentially expose students and employees to hazardous materials and waste, we focused this audit primarily on the use of hazardous materials in these departments. CSU employs a range of individuals within these departments who may regularly encounter hazardous materials. These employees include laboratory workers, such as faculty, laboratory instructional support assistants and technicians (support technicians), and student employees.

CSU's Framework for Meeting Health and Safety Requirements

Because it is an employer, CSU is subject to state law that requires every employer to establish, implement, and maintain an effective injury and illness prevention program. This program must identify the person or persons responsible for its implementation, include a system—which may involve disciplinary action—for ensuring that employees comply with safe and healthy work practices, and establish a readily understandable system for communicating with employees about matters relating to occupational health and safety. Further, California's Division of Occupational Safety and Health (Cal/OSHA) enforces the State's occupational safety and health laws and regulations. One of these regulations requires employers, including CSU campuses, to use a hazard communication program, safety data sheets, training, labels, and other forms of warning

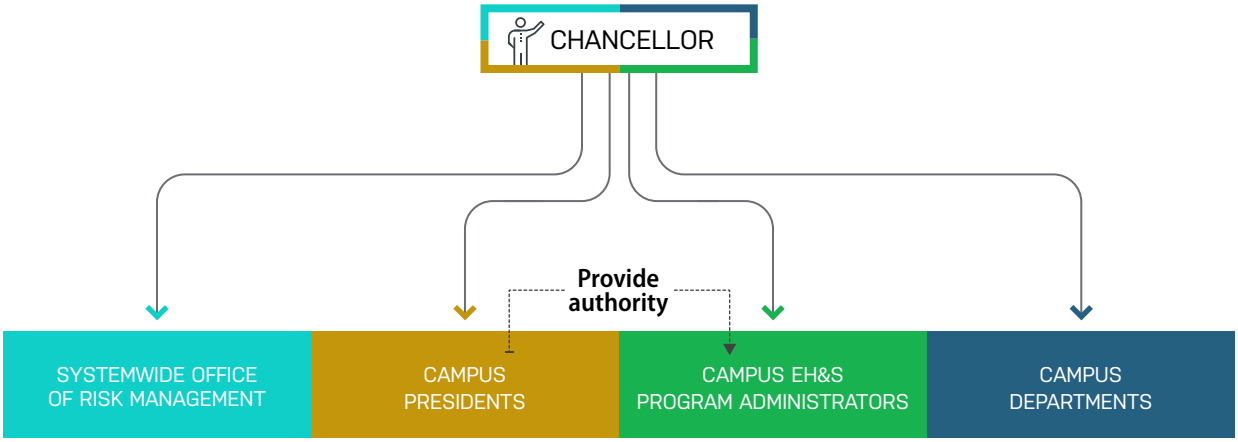
to provide information to their employees about the hazardous chemicals to which they may be exposed. Finally, state regulations require CSU campuses to have written plans that address certain health and safety risks to which employees may be exposed.

In 2008 the CSU Office of Audit and Advisory Services (University Auditor) released an audit report that concluded that the Chancellor's Office had not assigned clearly defined programmatic health and safety responsibilities to its systemwide Office of Risk Management to reduce the risk of regulatory scrutiny, fines and sanctions, and inconsistent treatment and handling of issues. Specifically, the report identified the need for improvement in the systemwide policies for occupational health and safety, monitoring of prior audit findings, tracking and provision of health and safety training for employees and students, as well as improvement in health and safety inspection programs. Although occupational health and safety laws do not protect students who are not employed by CSU, the 2008 report also recommended that the Chancellor's Office remind the campuses of the need to strengthen student health and safety training, assign campus responsibility for student training, and ensure that campus policies mandate that unresolved student training issues receive sufficient management to ensure resolution.

In response to the University Auditor's findings and recommendations, the Chancellor's Office issued Executive Order 1039 (Order 1039), which became effective on January 1, 2009. Order 1039 defined the delegation of authority and responsibility for environmental health and safety throughout CSU. It also directed campuses to evaluate the need for student health and safety training, particularly for educational activities that could expose students to biological, chemical, or physical hazards. Figure 1 describes the chancellor's delegation of authority and designation of responsibilities for ensuring health and safety for students and employees according to Order 1039.

Under Order 1039, each CSU campus has an environmental health and safety program administrator (EH&S director) who is responsible for developing and maintaining a campus health and safety program that meets the state requirements for injury and illness prevention programs, as well as other applicable Cal/OSHA requirements. The campus health and safety program must include a system for ensuring that employees comply with safe and healthy work practices, procedures for identifying workplace hazards, and procedures for investigating occupational injuries and illnesses, among others. In addition, Order 1039 states that campus deans and department chairs should assist their EH&S directors in evaluating the need for student health and safety training, with a focus on those courses with a potential for exposure to biological, chemical, or physical hazards.

Figure 1
Description of the Chancellor's Delegation of Authority and Designation of Responsibilities for Health and Safety



- Administrative oversight for developing risk management programs, resource documents, and training programs.
- Provide guidance on EH&S policies and procedures applicable to CSU and in accordance with applicable regulations.

- Designate campus EH&S program administrator.
- Authorize EH&S program administrator to develop and maintain campus health and safety program.
- Ensure that the annual health and safety program reporting requirement is accomplished. The president can designate this responsibility to others.

- Develop and maintain campus health and safety program that meets legal requirements.
- Provide an annual health and safety program report to the campus president with a copy to the systemwide Office of Risk Management.

- Promote healthy and safe classrooms by assisting the EH&S program administrator in evaluating the need for student training, focusing on courses with a potential for exposure to biological, chemical, and/or physical hazards.

Source: California State Auditor's analysis of the Chancellor Office's Executive Order 1039.

Campus Safety Plans and Equipment

As Table 1 on page 11 shows, state and federal regulations generally require each campus to develop different types of written plans that address specific areas related to health and safety. One of these, the chemical hygiene plan (chemical plan) sets forth procedures, equipment, and practices that are capable of protecting employees working in laboratories from the health hazards of certain chemicals. Similarly, the hazard communication program describes how the standards for labels, safety data sheets, and employee information and training will be met, while the respiratory protection program identifies specific procedures required for respirator use to protect the health of employees.

Engineering Controls, Safeguards, and Personal Protective Equipment

Engineering Control: A method of controlling occupational exposure to injurious materials or conditions, such as vapors, including by isolating or enclosing the hazard. An example in a laboratory can include a fume hood, which captures contaminated air and conducts it into the exhaust duct system.

Safeguard: A method of mitigating or preventing a specific danger such as the effects of exposure to chemicals or other hazardous materials. Examples in a laboratory can include eyewash stations, shower equipment, and fire extinguishers.

PPE: Personal gear designed to protect individuals from contact with chemical, physical, or other workplace hazards. Examples in a laboratory can include safety glasses, lab coats, respirators, and gloves.

Sources: Federal regulations, state law and regulations, and information from the federal Office of Safety and Health Administration's website.

In addition, state law requires CSU to provide and use safeguards that are reasonably adequate to render employment and places of employment safe. This may require that campuses fit their laboratories with equipment designed to prevent or mitigate exposure to hazardous materials. For example, as the text box shows, certain engineering controls, safeguards, and personal protective equipment (PPE) may be used in laboratories to reduce employees' risk of exposure to hazardous materials.

Recent Health and Safety Concerns Regarding Two CSU Campuses

The Joint Legislative Audit Committee (Audit Committee) directed the California State Auditor (State Auditor) to review the health and safety compliance of four CSU campuses: California State University Channel Islands (Channel Islands); California State University, Sacramento (Sacramento); San Diego State University (San Diego); and Sonoma State University (Sonoma). The Audit Committee also directed the State Auditor to survey support technicians at all 23 campuses; we present the survey results in Appendix B, which begins on page 59. Incidents at two of the four campuses were of particular concern to the Audit Committee. Specifically, two incidents occurred at Sacramento, and a Sonoma employee sued Sonoma alleging, in part, retaliation when he complained about health and safety issues. These incidents have raised concerns among some legislative members about CSU's efforts to oversee and regulate health and safety procedures on its campuses.

In one of the incidents, Sacramento notified the campus community in January 2017 that several drinking water sources on campus had tested positive for excess levels of lead. According to the notification, based on those testing results, Sacramento had turned off certain drinking water sources. A March 2017 student newspaper article indicated that Sacramento officials were made aware of the presence of lead in the drinking water sources in August 2016, after a professor and a group of colleagues and students began the testing in March 2016. An employee union and certain members of the Legislature expressed concern about an apparent 10-month delay before Sacramento officials notified the campus community of the presence of lead in the drinking water sources. In Appendix A, beginning on page 55, we present a timeline of events related to the discovery of lead in the drinking water sources and the actions campus officials took in response to the discovery. This timeline shows that Sacramento responded to the discovery of lead in a manner that was appropriate and timely.

A separate incident at Sacramento resulted in students being exposed to harmful chemicals. According to Sacramento's Office of the President's incident report, which it based on an investigative report made by the University of California Center for Laboratory Safety, a poorly supported shelf in a recently remodeled laboratory resulted in a chemical spill in May 2016. One student's feet were soaked with chemicals and another student was splashed on both feet and lower legs. The students evacuated the room, and five Sacramento employees participated in the spill cleanup. According to the incident report, the campus did not know the exact nature of the spilled chemicals at the time of the cleanup and did not identify the chemicals in broken bottles until the day after the spill. Employees involved in the cleanup have submitted claims to the CSU and have alleged suffering health problems as a result of their jobs at Sacramento.

Table 1
Campus Health and Safety Plans

Chemical Hygiene Plan	A plan to protect employees from the health hazards that hazardous chemicals present in laboratories.
Exposure Control Plan	A plan to eliminate or minimize employee occupational exposure to blood and other potentially infectious materials.
Hazard Communication Program	A program to inform employees about the hazardous chemicals to which they may be exposed. The program should describe the employer's methods for labeling hazardous materials and providing forms of warning, for providing access to safety data sheets that provide information on chemical hazards, and for providing employee information and training.
Injury and Illness Prevention Program	A system for ensuring that employees comply with safe and healthy work practices. The program should involve communicating in a form readily understandable by all affected employees on matters relating to occupational safety and health.
Laser Safety Plan*	A plan to reduce the risk of injuries associated with the use of lasers by establishing procedures for this type of work.
Radiation Protection Program	Information regarding procedures and engineering controls that are based upon sound principles related to radiation protection. The goal of the program is to ensure that occupational doses and doses to members of the public are as low as is reasonably achievable.
Respiratory Protection Program	A program to provide specific procedures for respirator use to protect the health of employees.

Source: California State Auditor's review of state and federal regulations.

* State and federal regulations do not require laser safety plans.

Finally, an incident at Sonoma involved the campus's alleged inadequate handling of complaints regarding health and safety. According to a student newspaper article, an employee identified the presence of lead-based paint on a certain campus building in 2012 and raised concerns with his supervisor. However, the employee claimed that campus officials dismissed his recommendation on how to remove the substance, resulting in unnecessary health risks to students, employees, daycare children, and visitors. The same employee sued Sonoma in June 2014 claiming retaliation when he complained about asbestos-related health and safety issues. According to the student newspaper article, in the employee's lawsuit, he alleged that dangerous levels of asbestos dust travelled through ventilation systems in a building where faculty worked on campus and his supervisor ignored warnings regarding asbestos in the same building. The employee claimed that he was retaliated against when he complained about possible health and safety issues resulting from asbestos-related remediation efforts. In March 2017, the jury awarded the employee nearly $388,000 to compensate him for lost income and damages for retaliation. With respect to the employee's health and safety claims, the jury found partially in CSU's favor and partially in the employee's favor. According to the California Courts' website, CSU's appeal is pending.

Chapter 1

NEITHER THE CHANCELLOR'S OFFICE NOR THE CAMPUSES WE REVIEWED HAVE CONSISTENTLY PROVIDED THE OVERSIGHT AND TRAINING NECESSARY TO ENSURE THE SAFETY OF EMPLOYEES AND STUDENTS

Chapter Summary

The Chancellor's Office has not provided effective leadership to its campuses to ensure that they address health and safety issues for managing hazardous materials. Although the University Auditor has raised concerns related to the campuses' health and safety inspections and their employee and student trainings for at least two decades, the Chancellor's Office has not held the campuses accountable for rectifying these issues. Further, the Chancellor's Office has not ensured that campuses submit required annual reports on their health and safety programs, nor has it ensured that the reports that the campuses do submit identify risks to employees and students. As a result, issues regarding campuses' compliance with health and safety standards have persisted.

In particular, we identified significant concerns related to oversight and training at the four campuses we reviewed. Specifically, these campuses do not have joint committees, as a bargaining agreement with a union requires, to solicit employee concerns about health and safety and to develop recommendations to the Chancellor's Office. Further, although Sacramento's and Sonoma's chemical plans require their campuses to have committees to assist in evaluating the effectiveness of those plans, neither campus has ensured that its committee meets regularly and discusses chemical usage policies and issues. Moreover, none of the four campuses could provide documentation to demonstrate that they conducted annual reviews of their chemical plans' effectiveness. In addition, the four campuses have not ensured that all relevant employees receive critical training on topics such as laboratory safety, hazardous waste, and hazard communication, as state regulations require. Similarly, they could not always demonstrate that they provided students with health and safety training before the students began working in laboratory environments. As a result of these deficiencies, the campuses have unnecessarily jeopardized the health and safety of employees and students.

The Chancellor's Office Has Not Provided the Oversight Necessary to Ensure That Campuses Meet Health and Safety Requirements

The Chancellor's Office has not ensured that it receives the information necessary to provide effective oversight of the campuses' compliance with health and safety requirements. Although under state law a board of trustees administers CSU, state law also identifies the chancellor as CSU's chief executive officer. The board of trustees has issued standing orders delegating to the chancellor the authority and responsibility to take whatever actions are necessary for CSU's functioning. Thus, through his or her office, the chancellor is responsible for ensuring that CSU complies with EH&S laws and has the authority to require systemwide compliance with such laws. Further, state law requires the chancellor—as the individual responsible for CSU's overall operations—to establish effective monitoring of the campuses' health and safety programs. Receiving consistent information from the campuses regarding their health and safety programs is a critical component of ensuring that those programs align with expectations. The Chancellor's Office appears to have recognized this need: Order 1039 requires campuses to submit to their respective campus presidents and to the systemwide Office of Risk Management at the Chancellor's Office annual health and safety reports that could include reviews of significant events, program trends, status of key program areas, and performance data.

As of February 2018, 13 of the 23 campuses had not submitted the required annual health and safety reports to the Chancellor's Office.

However, the systemwide Office of Risk Management has not ensured that the campuses report this critical information to the Chancellor's Office. As a result, the Chancellor's Office receives only limited information on relevant issues impacting employee and student health and safety. According to the Chancellor's Office's data, as of February 2018, 13 of the 23 campuses had not submitted the required annual reports within the last three fiscal years. In fact, four campuses had not submitted any reports since Order 1039 took effect in 2009. According to the director of systemwide risk management (risk management director), the Chancellor's Office has not consistently contacted the noncompliant campuses regarding the reports. Although we believe this would be a small undertaking, he indicated that his office has not prioritized obtaining these reports from the campuses because, as discussed below, these reports do not frequently contain meaningful data. Without consistent and regularly reported information about campuses' health and safety programs, the Chancellor's Office cannot fully understand and take steps to mitigate issues that could pose risks to employees and students.

Further, the Chancellor's Office has not established guidelines regarding the specific information the campuses should report, which makes the information it receives from campuses less useful.

Order 1039 leaves the content of the reports to the discretion of the campuses. According to the risk management director, the campuses that do submit the reports appear reluctant to be openly self-critical and identify areas for improvement. He indicated that instead they are more inclined to provide information about processes that enhance their health and safety efforts. For example, in one report, a campus mentioned improvements it had made to increase risk awareness and reduce risk exposures within different campus departments. However, it did not identify specific areas of risk, such as employee training efforts or inspections of laboratory safety equipment. Although information about improvements can be helpful, it does not enable the Chancellor's Office to effectively identify and address health and safety-related problems at the campuses. Further, because Order 1039 does not require campuses to provide uniform information, the Chancellor's Office cannot identify trends and draw conclusions about systemwide health and safety. Finally, the lack of consistent and meaningful data negatively affects the risk management director's ability to provide input to the University Auditor on potential areas of risk that could inform the systemwide audit plan.

The University Auditor's work has also demonstrated the failure of the Chancellor's Office to sufficiently oversee health and safety on the campuses. Over two decades, the University Auditor has repeatedly recommended that the Chancellor's Office increase its oversight of employee and student health and safety training and inspections of laboratory safety equipment and workplace hazards. For example, nearly 25 years ago in a 1994 audit report, the University Auditor noted that the Chancellor's Office had not made a concerted effort to ensure that all campuses had the procedures in place to provide applicable employees with timely and adequate required training. Further, that report found that select campuses did not always comply with regulatory requirements related to workplace inspections. Similarly, in a 1998 audit report, the University Auditor found that campuses did not adequately maintain individual health and safety training records for employees, did not have procedures in place to ensure that students formally acknowledged they had received laboratory safety training, and did not conduct inspections of laboratory safety equipment within established time frames or maintain evidence of inspections. The University Auditor recommended at that time that the Chancellor's Office advise the campuses of the obligation to assure implementation of employee training guidelines and adopt systemwide policy and guidelines that specifically address occupational health and safety concerns related to students. It also recommended that the Chancellor's Office direct the campuses about their responsibility to perform periodic occupational health and safety inspections.

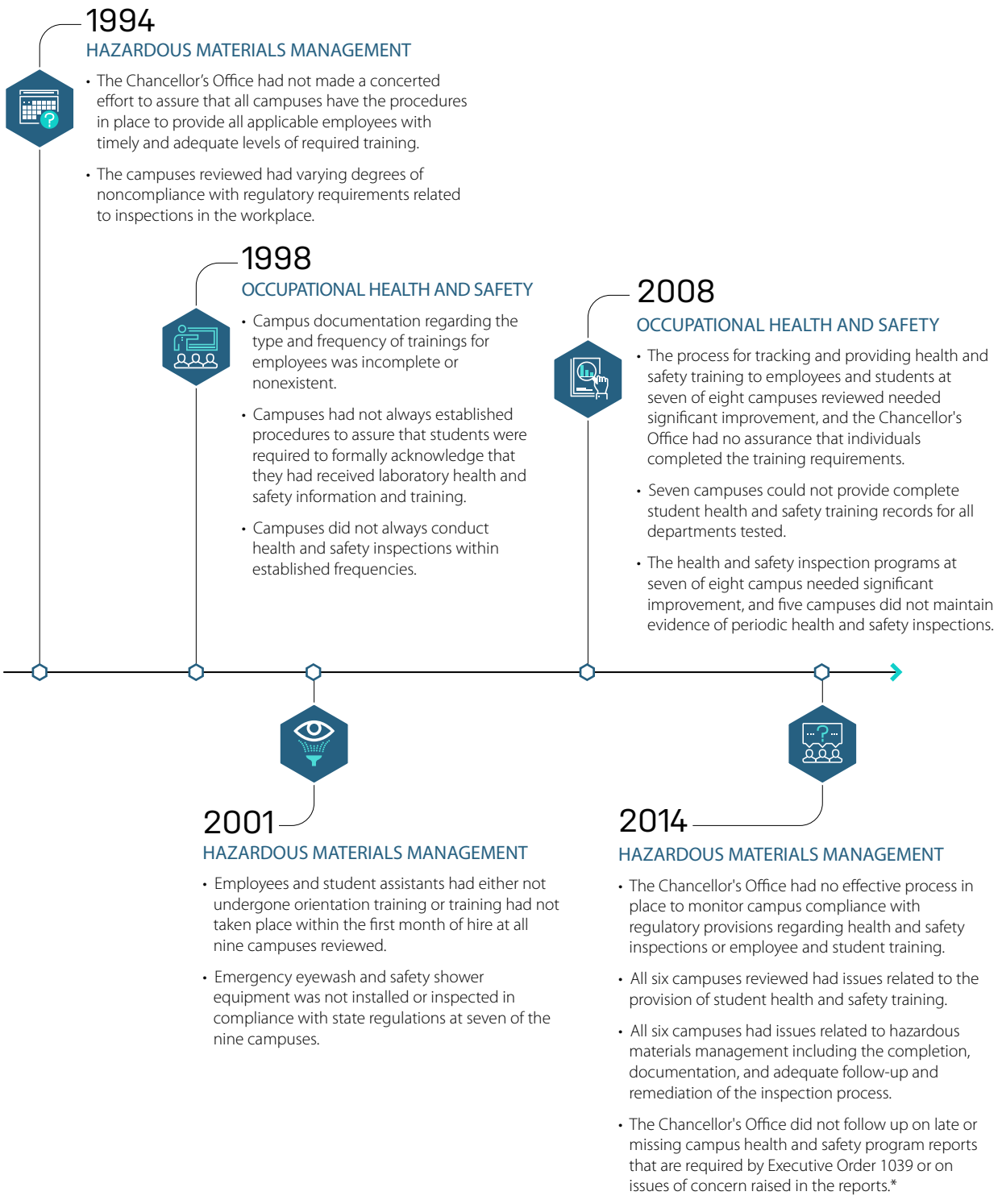
Over two decades, the University Auditor has repeatedly recommended that the Chancellor's Office increase its oversight of employee and student health and safety training and inspections of laboratory safety equipment and workplace hazards.

Although that report noted that the Chancellor's Office concurred with the findings and the related recommendations, Figure 2 shows that the University Auditor identified nearly identical findings related to trainings and inspections in its 2008 occupational health and safety audit and in its 2001 and 2014 hazardous materials management audits.

With five reports over two decades identifying similar systemwide health and safety issues, we find it troubling that the Chancellor's Office has not taken more action to require the campuses to improve their health and safety programs. As the University Auditor indicated in its 2008 and 2014 audit reports, a failure to conduct inspections and a lack of effective oversight of hazardous materials management activities, such as safety trainings, increase the risk of serious injuries and illness and expose CSU to potential litigation and regulatory sanctions. Nonetheless, as we describe later in this report, we found that campuses are still struggling to ensure and demonstrate that employees and students receive the necessary trainings, to conduct inspections of laboratory safety equipment, and to perform self-audits of laboratories in which hazards exist.

The consistency of these audit findings demonstrates that the Chancellor's Office's approach to providing oversight is not adequate to resolve the shortcomings in the campuses' health and safety programs. For example, the University Auditor noted in its 2014 report that the Chancellor's Office did not have an effective process in place to monitor campus compliance with regulatory provisions for employee health and safety training and inspections. When we questioned the risk management director, he explained that the Chancellor's Office does not see itself as the oversight entity responsible for ensuring health and safety on campus. Rather, he explained that it provides guidance, resource materials, and collaboration to the campuses and advocates for resources and causes that could better the health and safety condition for employees, students, and the public. He further stated that because the Chancellor's Office does not have the resources needed to monitor all aspects of health and safety on the campuses, the campuses are better positioned to address specific daily and operational on-site health and safety issues. However, we believe that the Chancellor's Office's failure to effectively hold campuses accountable for their actions may have enabled these issues to persist across the university system. In addition, because it has not created a meaningful structure for monitoring the campuses' health and safety programs, the Chancellor's Office lacks the information necessary to know whether its current direction and guidance are effective at addressing areas of risk.

Figure 2
Timeline of Selected University Auditor Findings Related to Campus Health and Safety



Source: California State Auditor's analysis of audits performed by the University Auditor.

* As of February 2018, three of the four campuses we reviewed had not submitted these reports to the Chancellor's Office for the last three fiscal years.

The Chancellor's Office has taken some recent steps to identify and address concerns regarding systemwide health and safety.

The Chancellor's Office has taken some recent steps to identify and address concerns regarding systemwide health and safety. For example, the systemwide Office of Risk Management has begun facilitating periodic meetings with working groups composed of relevant campus employees to address risk management items and environmental health and safety concerns. In addition, the Chancellor's Office established a systemwide task force in January 2017 that is charged with addressing environmental health and safety issues, including laboratory safety and faculty training, determining how best to address these issues as a system, identifying where in the system other environmental health and safety areas may exist that could be candidates for improvement, and recommending to the chancellor strategies and options for addressing where such improvements can be realized. The Chancellor's Office also contracted with a consultant in October 2017 to help develop a laboratory safety manual and to provide insight on the development, implementation, and tracking of faculty laboratory safety training. At the same time, CSU contracted with a different vendor to use risk management software to, among other things, conduct systemwide hazard assessments to ensure that laboratory personnel are properly protected in their work environment. Finally, in July 2015, the Chancellor's Office created an EH&S manager position within the systemwide Office of Risk Management to, among other duties, obtain data from the campuses to evaluate and address systemwide health and safety concerns. The Chancellor's Office filled this position in September 2016 for nearly a year; however, in August 2017 this position became vacant and is still vacant as of March 2018. The Chancellor's Office hopes to fill the position by September 2018. Although these are positive steps, it is too soon to tell whether they will help the Chancellor's Office sufficiently address health and safety concerns.

The Chancellor's Office and Campuses Could Further Improve the Health and Safety of Employees and Students on Campuses

The Chancellor's Office and the four campuses we reviewed could do more to further improve health and safety of employees and students on campus. The Chancellor's Office and the four campuses have not convened systemwide and campus-level joint university safety committees as outlined in the bargaining agreement with the State Employees Trade Council (union). Such committees could enable them to receive employee feedback that could improve their health and safety practices and their work environments. Further, although Sacramento's and Sonoma's chemical plans require the campuses to have committees to assist in the process of evaluating their chemical plans, neither campus has ensured that its committee meets regularly and discusses chemical usage policies and issues.

State law requires employers to establish and maintain effective injury and illness prevention programs to, among other things, communicate with employees on matters relating to occupational safety and health. Employers can facilitate this communication by establishing labor and management health and safety committees. Toward this end, CSU and the union agreed as part of their bargaining agreement dating back to at least September 2012 to continue a joint health and safety committee (joint committee) at the systemwide level consisting of 12 members, with equal representation from CSU management and employees. Members of the systemwide joint committee are to meet as mutually agreed. The systemwide joint committee's purpose is to gather and analyze data to identify systemwide trends that it can use to make recommendations of corrective actions, including those related to campus or systemwide training, to the Chancellor's Office. Although the campuses have other committees that may discuss health and safety issues, the agreement also requires that each campus have a joint committee consisting of an equal number of management and employee representatives. The campuses' joint committees are to meet on a monthly basis or by mutual agreement. The purpose of the campuses' joint committees is to recommend safety regulations, guidelines, training programs, and necessary corrective actions concerning conditions associated with the work environment to campus officials, including those in the campuses' Environmental Health and Safety offices (EH&S offices). According to the agreement, the campus committees should provide copies of meeting minutes to the systemwide joint committee upon request, as well as information regarding injuries, illnesses, accidents, training needs, and any other topics that the systemwide joint committee feels would be helpful.

However, despite the agreement, we found no evidence that the Chancellor's Office or the four campuses we reviewed made efforts to convene the joint committees during our audit period. The associate vice chancellor, chief negotiator and senior labor relations advisor (associate vice chancellor) at the Chancellor's Office stated that the systemwide joint committee has not met for roughly seven years because there has been no mutual agreement to do so, nor has the union asked for such meetings. As part of the most recent negotiations, the associate vice chancellor stated that the parties have mutually agreed to reconstitute the systemwide joint committee, which is scheduled to meet in early May 2018.

We found no evidence that the Chancellor's Office or the four campuses we reviewed made efforts to convene joint health and safety committees during our audit period.

Three of the four campuses could not provide documentation to demonstrate that campus joint committees have ever existed. Sacramento explained that one of the reasons they have not held campus joint committee meetings is that the campus joint committees cannot fulfill their responsibilities that involve interacting with the systemwide joint committee because the

systemwide joint committee does not exist. The bargaining agreement requires the union to designate its representatives who will serve on the campus joint committee; however, officials at Sacramento explained that the union has not done so. According to Channel Islands' senior director of facilities services, the campus had a joint committee that met regularly and kept minutes up until about 2013; however, he could only provide minimal documentation indicating the committee met twice more than 10 years ago and struggled with attendance. Nevertheless, he explained that in 2013 the campus combined its monthly managers meeting with the joint committee to openly discuss any safety concerns and union related issues. However, the senior director of facilities services explained that although this committee meets on a monthly basis, it does not maintain meeting minutes and, therefore, could not provide documentation to demonstrate the committee has met. He also acknowledged that the committee was not aware of all of the requirements of the joint committee, but he said that the campus will take steps to achieve compliance with the various requirements, including ensuring that the required committee membership is met and maintaining meeting minutes. Officials at Sonoma and San Diego explained they were not aware of the specific requirements for a campus joint committee, but stated they will work on forming the committee by the end of April 2018 and May 2018, respectively.

Officials at Sonoma and San Diego explained they were not aware of the specific requirements for a campus joint committee.

Because it has not ensured that the systemwide joint safety committee convene, the Chancellor's Office has not taken advantage of the opportunity to obtain and analyze data on issues affecting multiple campuses. Consequently, it cannot ensure that it identifies systemwide trends and makes appropriate recommendations to address health and safety issues. Similarly, the campuses could do more to ensure they receive feedback from employee representatives on conditions associated with the campuses' work environments. The campuses could use this feedback to more effectively recommend interventions—such as specific training based on recent incidents—to relevant stakeholders on campus.

Although two of the four campuses we reviewed require the establishment of chemical hygiene committees (chemical committees) in addition to joint committees, these committees do not appear to have served their intended purposes. State regulations require any campus engaged in the laboratory use of hazardous chemicals to have a chemical plan. This plan must include, among other things, the operating procedures that the laboratory workers must follow when using hazardous chemicals and the standards that the campus will use to determine and implement measures to reduce employee exposure to such chemicals. The plan must also designate the personnel responsible for implementing the

provisions of the chemical plan, including the establishment of a chemical committee, if appropriate. Of the four campuses we reviewed, the chemical plans of two—Sacramento and Sonoma—require chemical committees. However, the two campuses could not provide any evidence that they have such committees that are fulfilling the responsibilities outlined in their respective plans. These chemical committees have important responsibilities, which include assisting with reviewing or updating the chemical plans; when they do not meet those responsibilities, it can have consequences for chemical safety on their campuses.

In 2006 Sacramento combined its chemical committee with its Campus Safety Advisory Committee to form a campuswide safety and environmental health committee. However, the new committee does not meet regularly and the meeting minutes do not reflect meaningful and regular discussions on chemical hygiene. Sacramento's EH&S director, who is a member of this committee, confirmed that the committee rarely discusses issues related to the chemical plan. Further, according to the EH&S director, Sacramento has not had a campuswide chemical committee for more than 10 years. In the absence of a committee of this type, Sacramento could not demonstrate that the campus had fulfilled key responsibilities that its chemical plan has assigned to its chemical committee, including making recommendations to the campus president about the use of chemicals. In addition, as we discuss later, the campus has not substantially updated its chemical plan in 15 years—a task that the chemical committee should have overseen. In fact, the laboratory safety task force (task force)—which the campus created in the fall of 2016 to address concerns arising from a laboratory incident in the spring of 2016 and a subsequent report produced by the University of California's Center for Laboratory Safety—recommended the creation of a chemical committee in order to better ensure the safety of employees and students.

Sacramento has not substantially updated its chemical plan in 15 years—a task that the chemical committee should have overseen.

Similarly, Sonoma's chemical plan states that a chemical team, which includes a chemical officer and a chemical committee, is responsible for reviewing the campus's chemical plan annually and updating it as necessary. However, the committee had only two documented meetings—one in 2015 and another in 2017—and based on the minutes, these meetings seemed perfunctory in nature and reactive in their discussion of chemical hygiene concerns. Moreover, after its last meeting in 2017, the committee's chair informed the campus's EH&S director that the committee agreed that having regularly scheduled meetings might be unnecessary and instead proposed that committee members discuss departmental safety concerns each semester over email and meet only if emergency issues arise. The committee has not met since March 2017, and Sonoma has also not updated its chemical plan since 2011.

The Four Campuses Could Not Demonstrate That They Consistently Assessed Their Chemical Plans Annually as State Regulations Require

Although all four campuses we reviewed have developed chemical plans as state regulations require, none of the campuses could demonstrate that they consistently conducted annual reviews of these plans for effectiveness. The chemical plan is a critical component of a campus's oversight because it enables the campus to specify the operating procedures that laboratory workers must follow when using hazardous chemicals as well as the standards campuses will use to determine and implement control measures, such as fume hoods or safety goggles, to reduce employee exposure to such chemicals. Consequently, state regulations require campuses to review and evaluate the effectiveness of their chemical plans at least annually and to update them as needed. Nonetheless, although Channel Islands and San Diego revised their plans more frequently and recently than Sacramento and Sonoma, none of the four campuses could provide documentation to demonstrate that they conducted annual reviews of their plans' effectiveness. As a result, particularly as it relates to Sacramento and Sonoma, certain information in their chemical plans may be outdated and may not align with their current practices or environments, increasing the risk to health and safety of employees and students.

The chemical plans of three of the four campuses—Channel Islands, San Diego, and Sonoma—clearly specify the campus entities or individuals responsible for overseeing or implementing all the plans' provisions. For example, both Channel Islands and San Diego have assigned their EH&S offices the responsibility for developing and implementing their chemical plans. On the other hand, Sonoma has designated responsibility for the overall management and administration of its chemical plan to its program administrator, whom the plan identifies as the dean of the School of Science and Technology (dean). Although the EH&S office is only responsible for certain elements under Sonoma's chemical plan, the dean stated that she partners with the EH&S office in a fully integrated manner to implement the chemical plan.

In contrast, Sacramento's chemical plan does not clearly identify the entity responsible for its implementation or oversight. Sacramento's senior director of risk management services stated that despite the missing information, he believes that the EH&S office has this responsibility. However, unless Sacramento clearly identifies the entity responsible for implementing and overseeing the chemical plan, it risks that its plan may not adequately safeguard the health and safety of employees and students.

In general, we found that the four campuses have otherwise appropriately ensured that they identify the individuals responsible for implementing aspects of the chemical plans. For example, all four campuses' chemical plans clearly define the roles and responsibilities of various employees working in campus laboratories, including laboratory supervisors and principal investigators. In addition, Channel Islands, Sacramento, and Sonoma have designated chemical officers during our audit period—July 1, 2014, through June 30, 2017—in compliance with state regulations. Although San Diego did not establish the chemical officer position until November 2016 and did not fill it until June 2017, the associate director of its EH&S office stated that she was the functioning chemical officer without that specific title.

Although the campuses' chemical plans may appropriately assign most responsibilities, we found that the campuses have not been able to demonstrate that they consistently performed one critical task. Some of the campuses' chemical plans assign responsibility for annually evaluating the plans' effectiveness as regulations require, and two campuses had recently updated their plans, but none could demonstrate that they had consistently done so for each year in our audit period. For example, Channel Islands, Sacramento, and Sonoma have assigned the responsibility for reviewing and updating their chemical plans to various campus entities but could not provide documentation—such as decision points and recommended revisions in their committee meeting minutes or memos to their campus communities—to demonstrate that they conducted the evaluations annually. San Diego had not assigned responsibility for the annual evaluations of its chemical plan at all and could not provide evidence that it had performed such evaluations. However, Channel Islands and San Diego had revised their chemical plans at least once during our audit period, July 1, 2014, through June 30, 2017, indicating that they had conducted a more recent review of the effectiveness of their plans.

Although the campuses' chemical plans may appropriately assign most responsibilities, we found that the campuses have not been able to demonstrate that they consistently evaluated the plans' effectiveness annually.

Both Sonoma and Sacramento acknowledged that they had not performed the annual evaluations of their chemical plans. Sonoma's chemical plan designates responsibility to the chemical officer for reviewing and updating the chemical plan annually, with input from the chemical hygiene team, which includes the chemical officer, associate chemical officer, chemical committee, and environmental safety director. However, Sonoma's chemical officer stated that he has not reviewed the chemical plan annually and that he has not seen any indication that the chemical plan needed additional revisions. In contrast, and an indication that Sonoma needs to more effectively oversee and communicate about its chemical plan, the campus's EH&S director stated that the chemical plan is due for an update, and he plans to update it by the end of June 2018 to incorporate, among other things, any recommendations from

our audit. Sacramento's chemical plan states that the chemical officer will review and evaluate the effectiveness of the plan at least annually and submit a report with recommendations to the campus's University Environmental Health and Safety committee, if necessary. Although EH&S office and Risk Management Services representatives, including the chemical officer, stated that there is no formal report from the chemical officer evaluating the effectiveness of the chemical plan, the campus has used the lack of chemical incidents and other compliance-related activities to gauge the plan's effectiveness.

In contrast, both Channel Islands and San Diego asserted that their campuses had conducted these annual reviews; however, they were unable to produce evidence to support their claims. Channel Islands' EH&S director stated that it has conducted frequent reviews of the effectiveness of the campus's chemical plan, primarily through the formal audits the campus conducts for compliance with the chemical plan. However, we found that although these audits may demonstrate the campus's compliance to its own policies, they do not evaluate the campus's chemical plan itself. Although San Diego's chemical plan does not clearly assign responsibility for the annual evaluations, the EH&S director stated that the chemical officer is responsible. San Diego's EH&S office's associate director claimed that she had conducted the annual reviews during our audit period. However, she could not provide documentation of such reviews. She stated that the chemical officer and EH&S office will document the reviews in the future.

The fact that the campuses lacked evidence that they had evaluated their chemical plans' effectiveness is especially concerning given that two of the campuses have not fully updated their chemical plans in at least six years.

The fact that the campuses lacked evidence that they had evaluated their chemical plans' effectiveness is especially concerning given that two of the campuses have not fully updated their chemical plans in at least six years. Although campuses are not required to revise their chemical plans annually, some campuses have not updated their chemical plans with as much frequency as others and certain information may be out of date and therefore may not reflect current campus practices. Specifically, Channel Islands revised its chemical plan in 2014, while San Diego revised its chemical plan in both 2015 and 2017. However, Sonoma has not updated its chemical plan since December 2011, more than six years ago. In fact, Sonoma's EH&S director acknowledged that some areas of the plan require updates, and we also identified processes and terms in the campus's chemical plan that do not accurately reflect the campus's current practices, such as chemical procurement, documentation of student training records, chemical committee responsibilities, and EH&S office inspections. We discuss a number of these processes in this report.

Similarly, Sacramento has not substantially revised its chemical plan in approximately 15 years. Specifically, the EH&S director explained that his office and the chemistry department began discussing revisions to the 2003 chemical plan in 2015, but they did not decide on any proposed changes to the plan, and therefore, there was no need to make any proposed policy recommendations to the campus president. However, this is not consistent with the concerns of the task force that Sacramento created in the fall of 2016 to address issues related to a laboratory incident earlier that year. For example, the task force highlighted its concern that the campus needed to review and update a number of its policies related to laboratory safety to reflect current best practices and changes in how the business of the university has evolved. Demonstrating the need for such revisions, the task force oversaw a complete update of the campus's chemical plan and provided a draft of the plan to the campus president in May 2017.

Sacramento has not substantially revised its chemical plan in approximately 15 years.

However, according to the EH&S director, the revised chemical plan included challenges that prevented it from being adopted by the faculty and employee unions in its entirety. In particular, because the chemical plan includes policies regarding union-represented employees' safety and possibly discipline, state law requires campuses to meet and confer with the respective unions. The EH&S director explained that as a result of concerns raised by the unions, the campus is in the process of revising the existing chemical plan in sections. He stated that Sacramento determined that the section related to accidents and chemical spills was the most critical to update and, as of March 2018, this section is pending final approval. The remaining 17 sections, the director explained, will be revised through a collaborative effort between the EH&S office and the College of Natural Sciences and Mathematics, to be followed by a process to meet and confer with the affected unions. When we asked him when he anticipated the completion of the chemical plan to occur, he said there was no formal date at that time.

The Campuses We Reviewed Have Not Ensured That All Employees and Students Receive Proper Health and Safety Training

The four campuses we reviewed have not ensured that all employees and students receive critical health and safety trainings. State regulations require that employers provide different trainings to employees who work with hazardous materials to ensure their safety and well-being, and the four campuses we reviewed have developed trainings to comply with these requirements. However, all four campuses failed to ensure that all employees receive the required training. Specifically, a significant number of the employees we reviewed had not received training in the areas of

laboratory safety, hazardous waste, or hazard communication. Similarly, the campuses could not demonstrate that all students who worked with hazardous materials or equipment received training and information on safety procedures and protocols. The campuses either did not ensure that the responsible departments trained students as required or did not require the departments to document that students received the appropriate training. Without documenting training, CSU cannot effectively ensure or demonstrate that those trainings have occurred and that students have received important safety information.

The Campuses We Reviewed Did Not Ensure That All Employees Received Required Trainings Related to Laboratory Safety, Hazardous Waste, and Hazard Communication

State regulations require campuses to provide their employees with training that is specific to their working conditions, as the text box describes. Because regulations allow employers to determine the frequency of refresher laboratory safety training, the campuses have set these trainings at various frequencies ranging from not providing the refresher training at all at Channel Islands to once every five years at Sacramento. Further, campuses have also set different frequencies for providing subsequent hazard communication training to nonlaboratory staff. All four campuses require subsequent hazard communication training as new hazards are introduced. Sacramento's Hazard Communication Program also requires subsequent hazard communication training at least once every three years for these staff.

Training Requirements According to State Regulations

Laboratory safety training: Campuses must provide employees who work in a laboratory setting with training on hazardous chemicals in their work area at the time of their initial assignment and when new exposures arise. Employers may determine when to provide refresher training.

Hazardous waste training: Any campus that temporarily stores hazardous waste must provide relevant staff with hazardous waste training within six months after employment and provide them with subsequent training in each following year.

Hazard communication training: Campuses must provide employees who do not work in a laboratory setting with training on hazardous chemicals in their work area at the time of their initial assignment and whenever new chemical hazards are introduced to their work environment.

Sources: State regulations.

Nonetheless, the four campuses we reviewed have not always ensured that their employees receive all required trainings as frequently as either their policies or state regulations require. We reviewed training records for five employees, including faculty and support technicians, who worked in laboratory settings at each campus for the three-year period from July 1, 2014, through June 30, 2017. We also reviewed training records for two employees who worked in each of the four campuses' art departments, which are not considered laboratory settings, yet who should have received hazardous waste and hazard communication trainings because they interacted with chemicals and temporarily stored hazardous waste. As Table 2 shows, the four campuses did not always ensure that employees received these trainings as required.

Table 2
Compliance With Laboratory Safety, Hazardous Waste, and Hazard Communication Training Requirements at the Four Campuses We Reviewed

July 1, 2014, Through June 30, 2017

EMPLOYEES WHO WORK IN A LABORATORY SETTING*	CHANNEL ISLANDS		SACRAMENTO		SAN DIEGO		SONOMA	
	LABORATORY SAFETY	HAZARDOUS WASTE	LABORATORY SAFETY	HAZARDOUS WASTE	LABORATORY SAFETY	HAZARDOUS WASTE	LABORATORY SAFETY	HAZARDOUS WASTE
Employee #1								
Employee #2								
Employee #3								
Employee #4								
Employee #5								

EMPLOYEES WHO DO NOT WORK IN A LABORATORY SETTING†	HAZARD COMMUNICATION	HAZARDOUS WASTE	HAZARD COMMUNICATION	HAZARDOUS WASTE	HAZARD COMMUNICATION	HAZARDOUS WASTE	HAZARD COMMUNICATION	HAZARDOUS WASTE
Employee #6								
Employee #7								

Source: California State Auditor's analysis of selected employees' training records provided by the four campuses.

Note: Some employees were hired during our audit period, and as such we only reviewed training records for the applicable years.

■ = The employee received the training as frequently as required during the review period.

■ = The employee did not receive the training as frequently as required during the review period.

■ = The employee did not receive the training at any time during the review period.

* Employers must provide these employees a laboratory safety training at initial assignment and when new exposures arise. Employers may determine when to provide refresher training, and the frequency of this training varied at each campus we reviewed, from not providing it at all at Channel Islands to once every five years at Sacramento.

† Employers must provide these employees hazard communication training at initial assignment and subsequent training when new hazards are introduced. Sacramento has chosen to require employees to receive this training every three years.

The level of noncompliance with training regulations varied from campus to campus. Of the seven employees we reviewed at Sacramento, the campus did not ensure that four received the hazardous waste training as frequently as required and another did not receive hazard communication training during our review period as frequently as required. For example, a part-time faculty member in Sacramento's chemistry department did not receive the training on hazardous waste during our three-year review period until February 2017. Six of the seven employees we reviewed at both San Diego and Sonoma also did not receive hazardous waste trainings as frequently as required. The same six employees at

these two campuses also did not receive laboratory safety or hazard communication trainings as frequently as required. Channel Islands made the hazardous waste training available to all staff; however, it did not always ensure that the employees we reviewed consistently received the required training.

In addition, although Channel Islands provided documentation demonstrating that the five employees who worked in a laboratory setting received laboratory safety training, because it does not provide refresher laboratory safety training, some of these employees had not received the training for several years. For example, one employee had not received the training since 2003. According to Channel Islands' EH&S manager, the campus does offer other trainings that cover some topics related to laboratory safety. Further, she explained that the former EH&S director, who retired in 2017, met with employees on a periodic basis to discuss issues surrounding laboratory safety and that this is a practice that EH&S staff have continued. Although state regulations do not specifically require campuses to provide refresher laboratory safety training, we believe it is a good practice to ensure that employees working in laboratories are familiar with any new requirements or changes in their work environments so that they can respond appropriately to any health and safety issues that might arise. Channel Islands' EH&S manager acknowledged that it would be a good practice going forward to provide refresher laboratory safety trainings.

Three of the four campuses have not adequately ensured that employees are trained on exposure to bloodborne pathogens.

Further, three of the four campuses have not adequately ensured that employees are trained on exposure to bloodborne pathogens. Specifically, state regulations require all campuses that have employees with occupational exposure to blood and other potentially infectious materials to create and maintain an effective exposure control plan designed to eliminate or minimize employee exposure. The regulations require that employers provide training to relevant staff on preventing exposure to bloodborne pathogens at the time the employee is first assigned to work with them and at least annually thereafter. Although all four campuses have developed bloodborne pathogen exposure control plans, three did not ensure that all relevant employees received training on the respective plans as required. For example, only one of the three Sonoma employees we reviewed had completed each of the annual trainings during the three years of our audit period. We found similar lapses at Sacramento and San Diego.

The problems we found at the four campuses appear to exist throughout the CSU system. Specifically, of the 193 support technicians who work in the types of departments in which we conducted audit work at our four selected campuses and who responded to our survey, 69—or 36 percent—across 21 campuses reported that they did not receive training on laboratory health

and safety protocols before starting their work. Further, 14 of these 69 individuals—across 10 campuses—reported that they never received any training on laboratory health and safety. These survey responses suggest that campuses need to do more to ensure that employees receive required trainings.

All four campuses we reviewed are aware that they are out of compliance with the training requirements, and each offered different reasons. For example, San Diego's EH&S director stated that he would need to notify the associate vice president of administration, and that notification would be relayed through the chain of command from the vice president of business and financial affairs to the vice president of academic affairs, in order to address concerns related to employee failure to complete required training. However, he could not provide evidence that he had done so for the employees we reviewed. Sonoma's EH&S director told us that due to limited resources, the EH&S office placed less focus on reviewing training records to verify employees consistently completed required safety training. Further, he claimed that the campus's EH&S office provides a general overview of hazardous waste training during the campus's new employee orientation, but he was unable to provide documentation that training occurred. He explained that staff often forgot to document when they provided this one-on-one training because they were busy. However, failing to retain training documents is a violation of state regulations, which require that an employer keep hazardous waste training records for current employees until a facility closes and training records for former employees for at least three years from the date they last worked at the facility.

All four campuses we reviewed are aware that they are out of compliance with the training requirements, and each offered different reasons.

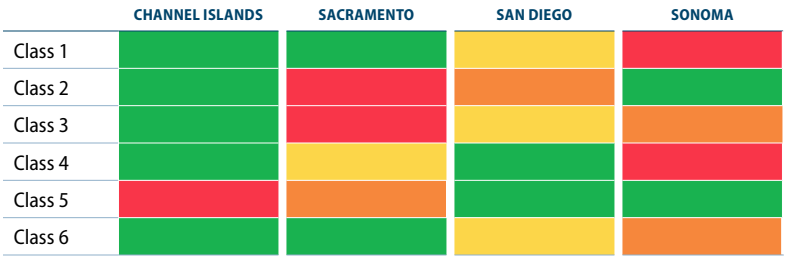
In addition, in September 2017, the county of Sacramento's Environmental Compliance Division within the Environmental Management Department (county) issued an administrative enforcement order against Sacramento for, among other things, failing to adequately train employees in the handling and management of hazardous waste to ensure that personnel are able to respond effectively to emergencies. According to the documents the county provided, Sacramento has since corrected this violation. However, because some employees did not receive the required trainings, the four campuses may place their staff, and ultimately their students, at risk of injury.

The Four Campuses Could Not Consistently Demonstrate That They Adequately Prepared Students to Safely Participate in Laboratory Courses

The four campuses could not consistently demonstrate that they had trained students in laboratory safety. At each of the four campuses, we reviewed six laboratory classes that campus

officials told us required students to wear PPE because of laboratory hazards. We expected that faculty or other appropriate personnel would be able to demonstrate that they had provided laboratory safety information to the students before they interacted with chemicals or hazardous materials. Some academic departments that are responsible for the classes we reviewed require students to sign forms that outline the necessary safety information and indicate that the students have received the appropriate training. Nonetheless, as Table 3 shows, the departments could not provide these signed safety acknowledgement forms for a number of the classes we reviewed. For example, although San Diego campus officials explained that students were required to wear PPE in the classes we tested there, the responsible departments could not provide safety acknowledgement forms for selected students from four of the six classes we reviewed.

Table 3
Four Campuses' Documentation of Students' Acknowledgement of Laboratory Safety Information
Fall 2014 Through Spring 2017



Source: California State Auditor's analysis of available documentation regarding laboratory safety information provided to five selected students for each class that required protective equipment, as well as interviews with campus officials.

- = Department provided safety acknowledgement forms signed by the selected students or other evidence that students received training.
- = Department did not provide the safety acknowledgement forms because of document retention practices.
- = Department indicated that it required students to sign safety acknowledgement forms but could not provide signed forms for some or all of the five students we selected for review.
- = Department officials stated that they did not require students to sign safety acknowledgement forms at the time the classes were offered.

Some department officials explained they could not provide these forms because of their document retention practices. However, in February 2008, the Chancellor's Office issued Executive Order 1031 (Order 1031), which includes a record retention and disposal schedule that indicates campuses should retain student training records for at least three years. Although each of the campuses we reviewed has documentation retention policies for student training

that generally reflect this schedule, actual document retention practices related to student safety acknowledgement forms varied across the departments at the four campuses. The departments' practices ranged from returning the forms to students at the end of a semester to retaining the forms for up to three years after the conclusion of a class. For example, San Diego's College of Sciences' associate dean for resources indicated that the chemistry department—which was responsible for two of the six classes we reviewed—returns the safety acknowledgement forms to students at the end of the semester to indicate that the students have returned any laboratory equipment they received. According to an instructional support technician in Sacramento's chemistry department, some chemistry department employees retain safety acknowledgement forms for at least three years; however, for one class we reviewed, she explained that a student assistant had destroyed the forms after one year. Retaining student training acknowledgement forms for three years after the conclusion of a class would not only satisfy the Chancellor's Office's expectations but would also demonstrate that students have received critical safety information.

In addition, some of the campuses could not provide us with safety acknowledgement forms because certain departments do not require documentation to demonstrate that students were trained. As Table 3 shows, three campuses had at least one class that did not require students to sign safety acknowledgement forms. As a result, although some department officials indicated that students were provided with this information, they could not confirm this through documentation. For example, two of the six classes we reviewed at Sonoma did not require students to sign a form to acknowledge that they received the safety training. An instructor for one of these classes told us that he requires students to wear PPE and instructs students on the necessary safety precautions in the laboratory; however, students in his class do not sign safety acknowledgement forms.

The absence of acknowledgement forms can be attributed to inadequate policies and processes to ensure that departments document student training. Specifically, Sacramento lacks policies on training students. Sonoma and San Diego have policies requiring their employees to provide students with health and safety training and to document those trainings; however, neither campus has a verification process to ensure that departments adhere to the policy. Channel Islands has a policy requiring documentation of student training, and its EH&S office staff told us that the campus reviews whether departments follow the policy as part of the EH&S office's annual laboratory self-audits. However, its physics department staff told us that it does not always document student training. For example, the campus was unable to provide

student acknowledgement forms for a class we reviewed in the physics department. According to the physics department staff, the department did not require students to sign acknowledgement forms because the experiments in this class occurred infrequently throughout the term. However, because the instructor required students to wear PPE in the laboratory to protect themselves from hazards, we believe that the physics department should have required these students to submit forms. Without signed acknowledgment forms, campuses cannot be assured and cannot demonstrate that students have received the necessary safety training.

The University Auditor has identified similar concerns in four audit reports since 1998 of various campuses' health and safety practices and procedures, and it has acknowledged the importance of documenting that students receive health and safety training. For example, in its April 2008 audit report focused on eight campuses, including San Diego, the University Auditor noted the need for significant improvement in the biology, chemistry, and art departments' processes for tracking and providing health and safety trainings to students. Further, the University Auditor found that some of the campuses' departments were unable to demonstrate that they had updated their health and safety policies and communicated them to students. In 2014 the University Auditor also identified problems with the provision of student training at six campuses it reviewed, including Channel Islands and Sonoma. In the 2008 and 2014 audits, the University Auditor concluded that the lack of effective oversight of student safety training increases the risk of serious injuries and exposes the campuses to potential litigation and regulatory sanctions.

Recommendations

Chancellor's Office

To ensure that it provides effective oversight of health and safety issues on the campuses, the Chancellor's Office should do the following:

- By September 2018, review and identify all recommendations issued to the Chancellor's Office and the campuses from the University Auditor's systemwide audits of campus health and safety practices since 1994. Using this information, develop and implement a plan by January 2019 to ensure that the campuses have taken appropriate actions to comply with health and safety requirements.

- By November 2018, develop a uniform health and safety reporting template and require the campuses to use it to annually report information related to campus health and safety, including data regarding employee and student training and any other areas the Chancellor's Office considers critical to its oversight of health and safety compliance. In developing this reporting template, the Chancellor's Office should consider the information from its own health and safety-related audits as well as the findings and recommendations of this audit.

Once it has developed the health and safety reporting template and campuses have used it to submit their reports, the Chancellor's Office should do the following:

- Assess the data and information in the reports to identify trends, risks, and best practices.

- Develop recommendations for improving campus health and safety and follow up on the campuses' implementation of any corrective actions related to these recommendations.

- Incorporate the risks identified in its assessments into the University Auditor's audit plan to ensure that the University Auditor evaluates problem areas related to campus health and safety.

- Follow up with campuses that fail to submit the required annual health and safety reports and take appropriate steps to ensure compliance with this requirement.

To ensure that it identifies systemwide trends and makes appropriate recommendations to address health and safety issues, the Chancellor's Office should do the following:

- Work with the appropriate union to form a systemwide joint committee, as agreed upon in its bargaining agreement with the union, by September 2018.

- Ensure that the systemwide joint committee meets and fulfills its responsibilities in accordance with the bargaining agreement by actively working with the union on an ongoing basis.

To ensure the health and safety of employees working with hazardous materials, the Chancellor's Office should prescribe the frequency for which the campuses provide refresher laboratory safety training to employees.

Campuses

To ensure that they receive feedback from employee representatives on conditions associated with their work environments and that they develop appropriate interventions, the four campuses should do the following:

- Ensure that their joint committees meet and fulfill their responsibilities in accordance with the bargaining agreement. If such committees do not exist, they should work with the union to form them by September 2018.

- Ensure that their joint committees record meeting minutes and provide copies of the minutes and other information to the systemwide joint committee, as requested.

To increase its oversight of chemical safety, Sacramento should do the following:

- Establish a chemical committee consistent with its chemical plan requirements.

- By June 2018, specify how often the new chemical committee should meet and then ensure that it meets as frequently as required and that it proactively addresses issues related to chemical hygiene and safety on campus.

- Ensure that the new chemical committee records its meeting minutes and makes those minutes available to all employees.

To increase oversight of chemical safety, Sonoma should do the following:

- By June 2018, specify in its chemical plan how often its chemical committee should meet.

- Ensure that its chemical committee meets as frequently as required and that it proactively addresses issues related to chemical hygiene and safety on campus.

- Ensure that its chemical committee records its meeting minutes and makes those minutes available to all employees.

To more effectively provide oversight of their chemical plans, the four campuses should annually evaluate those chemical plans for effectiveness and document the results of those evaluations, including their discussions of any recommended revisions.

To ensure that it has a chemical plan that is up to date and reflects current campus practices, Sacramento should develop and implement a revised chemical plan by January 2019.

San Diego should ensure that its chemical plan clearly defines the campus entity or individual who is responsible for reviewing and evaluating the effectiveness of its chemical plan at least annually.

To ensure that its chemical plan is updated to reflect current practices and changes to how the campus may have evolved, Sonoma should immediately update its chemical plan.

To ensure the health and safety of employees working with hazardous materials, the four campuses should do the following:

- By June 2018, review the training records of all employees who are required to take trainings related to laboratory safety, hazardous waste, hazard communication, or bloodborne pathogens and identify those who have not taken these trainings.
- By December 2018, make the required trainings available to these employees and establish procedures for ensuring that the employees have received all required trainings.
- Going forward, regularly monitor employee training records to ensure that all employees have received the required trainings.

To ensure that employees working in a laboratory setting receive current information regarding laboratory safety, Channel Islands should provide periodic refresher laboratory safety training to these employees beginning in the Fall 2018 semester.

To ensure the health and safety of students in a laboratory setting, the four campuses should do the following:

- By June 2018, Sacramento should develop campuswide policies to ensure that its departments are accountable for providing student training on laboratory safety.
- Channel Islands, Sacramento, and Sonoma should work with appropriate faculty to develop student safety training acknowledgement forms by June 2018.
- Beginning in the Fall 2018 semester, all four campuses should require departments to have those students required to wear PPE sign the student safety training acknowledgement forms to demonstrate that they have received proper laboratory safety training.

- By May 2018, Sacramento and San Diego should remind all departments to retain student training acknowledgment forms for at least three years after the end of classes.

- Beginning in the Fall 2018 semester, Sacramento, San Diego, and Sonoma should perform reviews at least annually to ensure that all departments are using the student training acknowledgement forms and are complying with the retention requirement.

Chapter 2

THE CAMPUSES WE REVIEWED HAVE NOT ALWAYS TAKEN CRITICAL STEPS TO MAINTAIN SAFE ENVIRONMENTS FOR THEIR EMPLOYEES AND STUDENTS

Chapter Summary

Numerous state regulations require employers, including the CSU campuses, to take actions to maintain safe environments for their employees. By completing such actions, campuses can also protect the health and safety of their students. Among other requirements, regulations require CSU to inspect the functionality of laboratory safety equipment, conduct periodic inspections to identify hazards in the workplace, and notify employees about the presence of certain hazardous materials. We found varying levels of compliance with the requirements at the four campuses we reviewed. For example, state regulations require campuses to regularly monitor the proper working conditions of critical safeguards, which include emergency eyewashes and showers that enable employees and students to quickly rinse away hazardous substances in an emergency. However, only Channel Islands complied with this requirement for the items that we reviewed. Without consistent inspections of safeguards and other safety equipment, campuses cannot know whether the equipment will function properly to help prevent injuries to students and employees.

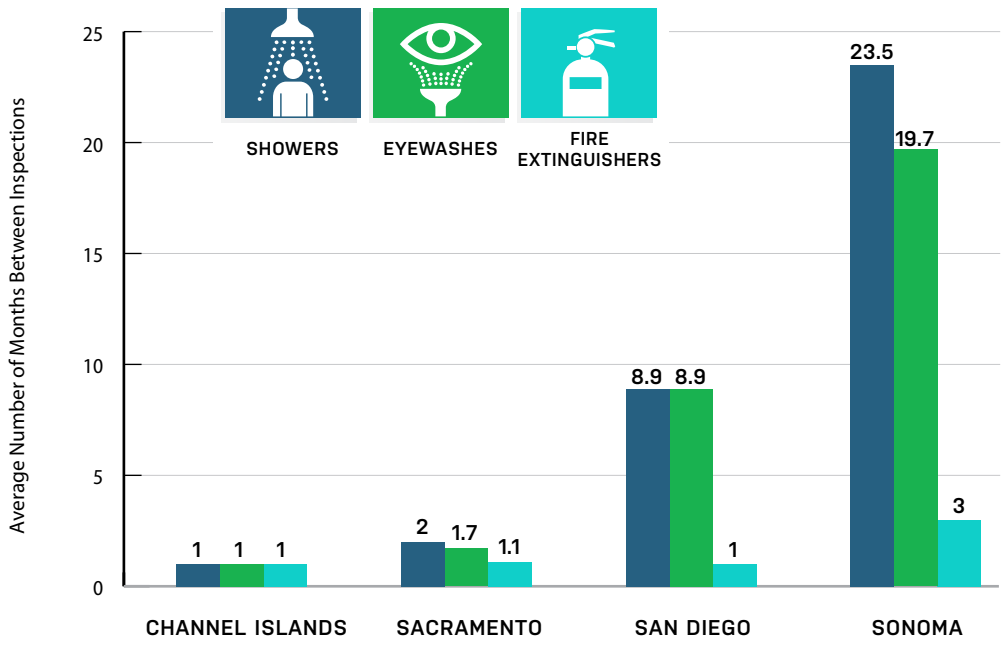
We found other instances in which the four campuses did not take actions that would ensure the safety of their work and classroom environments. For example, although all four have procedures for conducting inspections as state regulations require, none have consistently adhered to their procedures. In another example, not all of the campuses we reviewed complied with a state regulation requiring that they post warning signs about the presence of asbestos. Without this signage, employees may inadvertently expose themselves to this hazardous substance, which can have serious or even fatal consequences.

In Violation of State Regulations, Some Campuses Have Not Adequately Monitored the Proper Working Conditions of Critical Safeguards

Three of the four campuses we reviewed have neglected to adequately monitor the proper working conditions of critical safeguards as state regulations require. A safeguard, as we discuss in the Introduction, is a method of mitigating or preventing the effects of a person's exposure to dangerous substances. Many of the laboratories we reviewed contained showers and

eyewash stations—two examples of safeguards—to enable individuals to rinse off hazardous substances in an emergency such as a chemical spill. According to state regulations, eyewash and shower equipment must be activated—or *flushed*—at least monthly in order to verify it is operating properly. Similarly, state regulations require campuses to manually inspect fire extinguishers at least monthly and to record the dates of the inspections. As Figure 3 shows, despite the regulatory requirements, we determined that three of the campuses we reviewed—Sacramento, San Diego, and Sonoma—failed to flush showers and eyewash stations monthly, and Sonoma failed to inspect fire extinguishers monthly. Only Channel Islands conducted the required flushes and inspections of all safeguards we reviewed. When they do not conduct required flushes or inspections, campuses have less assurance that critical safeguards will function properly and help prevent injuries to employees and students during emergencies.

Figure 3
Three of the Four Campuses We Reviewed Did Not Always Complete Safeguard Inspections and Flushes Monthly



Sources: California State Auditor's analysis as well as data provided by the four campuses for the three most recent flushes or inspections for each safeguard we reviewed.

Note: State regulations require monthly flushes of showers and eyewashes, and monthly inspections of fire extinguishers. We calculated the average amount of time by measuring the time between the three most recent inspections or flushes. However, if the most recent inspection or flush had occurred more than a month before we completed our observation—thus indicating that the campus had not completed at least one inspection or flush—we used the length of time between our observation and the most recent inspection or flush in addition to the interval between the two most recent inspections or flushes to calculate the average.

Sacramento and San Diego both acknowledged that they could improve the timeliness of their safeguard flushes and inspections. For example, Sacramento's EH&S director agreed with our findings and said there was no systemic cause for why Sacramento did not consistently flush its eyewashes and showers monthly. To improve oversight of these flushes, he stated that Sacramento created a standing work order to flush showers as of January 2018 and that the campus was working to implement a new oversight tool for eyewash flushes. As Figure 3 shows, San Diego allowed even more time to pass between flushes of its showers and eyewash stations than Sacramento: the average time between eyewash flushes was nearly nine months. The director of facilities services at San Diego acknowledged that eyewashes and showers should be flushed monthly but stated that the flushes have occurred sporadically since the employee previously responsible for conducting them retired in early 2016. This timing aligns with our finding that between May 2016 and April 2017, San Diego did not flush three of the four shower and eyewash stations we reviewed. Those same three showers had not been flushed since April 2017 when we observed them in October 2017, indicating that San Diego has inconsistently conducted the flushes for about 18 months.

Sonoma also failed to flush shower and eyewash stations as required and additionally failed to consistently inspect other equipment, such as fire extinguishers. Our review found that Sonoma allowed an average of nearly two years to pass between shower flushes and more than 18 months to pass between eyewash flushes. In one extreme example, Sonoma failed to flush the only shower in a chemistry stockroom for more than six and a half years. Additionally, we found that Sonoma allowed an average of three months to elapse between inspections of the fire extinguishers we reviewed—triple the one-month requirement. In one instance, we found that it had been eight months since Sonoma had inspected the sole fire extinguisher in a biology lab. When we asked Sonoma's vice president of administration and finance about the campus's failure to inspect safeguards monthly as required, she acknowledged the shortcomings but did not offer an explanation for why the failure had occurred. We additionally determined that Sonoma had not inspected two biosafety cabinets—containment devices for work involving biohazardous materials—annually as required. The vice president of administration and finance provided evidence that Sonoma is working to develop a process to ensure that it completes preventative maintenance, including inspections of fire extinguishers and biosafety cabinets and flushes of eyewash stations and showers, within required intervals. She anticipated that this process would be completed by summer 2018.

In one extreme example, Sonoma failed to flush the only shower in a chemistry stockroom for more than six and a half years.

Our findings regarding the failure of campuses to conduct monthly flushes of showers and eyewash stations are similar to previous findings by the University Auditor. Specifically, in 2001, the University Auditor issued a report on its review of the effectiveness of policies and procedures for hazardous materials management and found that six of the nine campuses it reviewed did not flush showers and eyewashes monthly as required. In its response to this finding, the Chancellor's Office stated that it would issue a directive to the campuses to inform them that noncompliance with the monthly flush requirements was an unacceptable risk for the campuses to assume. When we asked the risk management director at the Chancellor's Office for a copy of this directive, he stated that he was unable to locate it. Our review demonstrates that some campuses still do not consistently conduct flushes as required 17 years after the University Auditor issued its report. The Chancellor's Office could better monitor campuses' compliance with the inspection requirements if it required campuses to report on the timeliness of their safeguard inspections in the annual reports that we discuss in Chapter 1.

Our review demonstrates that some campuses still do not consistently conduct flushes as required 17 years after the University Auditor issued its report.

In addition, we determined that Sonoma also failed to inspect fume hoods—a type of engineering control—as required. As we indicate in the Introduction, engineering controls are methods of protecting campus employees and students from exposure to injurious substances. Specifically, Sonoma did not inspect fume hoods—enclosed ventilated devices designed to draw air inward to control exposure to hazardous substances into which individuals insert only their hands and arms so that they can work with hazardous substances—as often as state regulations require. State regulations require that fume hood inspections occur every year. Sonoma's EH&S director agreed that fume hood inspections are designed to ensure that an individual working at a fume hood has the appropriate air flow to protect him or her from substances in the fume hood. However, at the time of our review in September 2017, Sonoma had not inspected any of the 17 fume hoods we selected for more than three years. If it conducted inspections of fume hoods as required, Sonoma would decrease the risk of failing to address problems with critical safety equipment. According to Sonoma's EH&S director, Facilities Services staff were confused about how often they needed to inspect fume hoods. He explained that when he reviewed the campus's work order system, which the campus uses to track preventative maintenance work orders, he could not find any work orders to inspect fume hoods in the building that he stated houses the most fume hoods. After we shared the significant shortcomings we identified, the campus's vice president of administration and finance showed us documentation demonstrating that Sonoma hired an outside company to inspect fume hoods beginning in December 2017. If Sonoma were to

include preventative maintenance work orders for fume hood inspections in its work order system, it could better ensure that it completes fume hood inspections annually as required.

Sonoma's failure to conduct required inspections of any of the fume hoods we reviewed was markedly different from what we found at the other campuses. Channel Islands and San Diego had inspected all of the fume hoods we reviewed within one year, as required. Also, Sacramento generally complied with the fume hood inspection requirements. For the 20 fume hoods we reviewed in Sacramento, we found that three had one late inspection each, and those three inspections were only about one month late.

Finally, while conducting our audit work at Sacramento, we observed that its safeguards were not always readily accessible. State regulation requires that emergency eyewashes and showers be in accessible locations that require no more than 10 seconds for an injured person to reach. However, when we visited a Sacramento art sculpture lab in which students could use potentially dangerous materials, we found that if someone required an eyewash, he or she would need to go down a flight of stairs and through a bathroom in order to access that equipment. Further, if the bathroom door was locked, the person would need to go outside of the building, traverse two additional flights of stairs, and use another entrance in order to access an eyewash. When we discussed this situation with the EH&S director, he agreed that an eyewash was not sufficiently accessible for those in the upstairs area of the art sculpture lab and that he would start working with the Facilities department to install an eyewash as soon as practicable. We also observed at Sacramento that should an individual require an emergency shower while working in the solvent room of the printmaking area in an art department building, the individual would need to leave the room, cross a common area, and use the shower in a room in which individuals work with acids. When we spoke to the EH&S director about those concerns, he explained that solvents that could cause someone to require an emergency shower will not be used in the future in that area, which would eliminate concerns about the accessibility of the shower.

Our survey of support technicians whose work exposes them to hazardous materials suggests that the problems we identified are not isolated to the four campuses we reviewed.

Our survey of support technicians whose work exposes them to hazardous materials suggests that the problems we identified are not isolated to the four campuses we reviewed. Most significantly, 18 of the 193 support technicians and assistants who worked in the same kinds of departments as those where we conducted audit work reported experiencing a situation in which they needed safeguards or engineering controls but the equipment was either unavailable or malfunctioning. These responses were not isolated to a few campuses but rather reflected the answers of employees from 13—more than half—of the campuses. Furthermore, more

than half of the safeguards that the support technicians reported as malfunctioning in laboratory areas were either eyewash stations or showers. These responses underscore the need for campuses to conduct inspections as required to ensure that safeguards and engineering controls will work properly in emergency situations to protect the health and safety of the employees and students who use them.

Campuses' Average Time to Repair Engineering Controls Has Varied

The Audit Committee requested that we determine the average repair time for engineering controls. Examples of engineering controls include fume hoods and cabinets for storing flammable materials. Although the campuses we reviewed have work order management systems that can track requests for repairs to engineering controls as well as the length of time it takes to complete those repairs, we encountered various challenges in calculating the average repair times at the four campuses we reviewed.

Campuses did not always separately track the dates that repairs were completed and the dates for the final administrative review of work orders.

One of the challenges was that the campuses did not always separately track the dates that repairs were completed and the dates for the final administrative review of work orders. For example, Sonoma's work control system administrator indicated that its work order system's closure date reflects the date the repairs were completed. In contrast, an assistant director of logistical services and maintenance at Channel Islands explained that the campus's work order system closure date reflects the date when the technician completed the repair work *and* when supervisory review of the work order was final; he said, the campus did not track the interim dates of when repairs were completed. Although a Facilities Services administrator in Sacramento explained that its work order closure date also accounted for when both the necessary repair work and associated administrative review—such as finalizing purchases and waiting for invoices—was complete, he indicated that Sacramento had a field in its work order system that reflected when the work was completed; however, the administrator stated that this field was inconsistently used. Furthermore, although San Diego's current work order management system separately includes a date on which repair work was completed, the service center manager with San Diego's Facilities Services stated that the campus did not use the date the work was completed in its prior work order system and indicated that the older system was in use during one year of our audit period. However, Sacramento, Channel Islands, and San Diego generally explained that the time between the repair date and administrative closing should be relatively short. We therefore used the dates between when the work order was opened and when it was closed at all of the campuses we reviewed.

An additional challenge we encountered was that in order for campuses to locate the work orders for engineering controls, they needed to search their work order systems for key words. We requested work orders containing the key phrases of *fume hood* and the name of another type of engineering control—*snorkel*. However, we only identified two work orders—which were closed in nine and 14 days—for snorkels across all four campuses we reviewed. Therefore, due to the limited population, we do not present calculations for snorkels in Table 4 on the following page. We present calculations only for fume hoods because it was a unique phrase that campuses could identify using a key word search. However, because this approach depends on a work order containing a key phrase, we do not have assurance that we identified all the work orders for fume hoods. Although it likely affected our ability to identify all work orders related to engineering controls, we do not believe that this issue is a limitation for campus management. Most of the campuses explained that they generally use their work order systems to run reports by "shop"—for example, reports on the timeliness of all work orders completed by the plumbers in Facilities Services rather than by type of equipment, such as fume hoods. This appears to be a reasonable manner in which to use the work order data.

Given these challenges, the data we present in Table 4 are the best available calculations of the average length of time campuses took to repair the engineering controls that we reviewed. In presenting these data, we note that the existence of a work order does not necessarily mean that the engineering control was entirely nonoperable. For example, a work order to replace a light bulb in a fume hood does not indicate that the fume hood was not ventilating properly and thus not protecting the user from hazardous substances. We further note that because of the different types of work needed, there is not a standard, average time frame within which we expected campuses to complete these work orders. For example, even though a work order requesting an evaluation of fume hoods at Channel Islands was open for nearly 60 days, the assistant director of facilities explained that the campus was likely waiting to receive the necessary parts to complete the repair. In contrast, Sacramento took eight days to close a work order that involved replacing light bulbs in a fume hood. Although both of these work orders were for repairs to an engineering control, the scope of the repairs—and thus the time needed to complete them—was significantly different. Finally, although we identified a work order for a fume hood that took Sacramento 352 days to close, the manager of engineering services explained that it stayed open that long because Facilities Services was waiting to receive an estimate and approval for a budget to replace the fume hood even though

the fume hood was working to its full capacity. However, he further explained that the requester ultimately decided not to replace the fume hood.

Table 4
Average Time to Close Work Orders for Fume Hoods at Four Campuses From September 2014 Through June 2017

	CHANNEL ISLANDS	SACRAMENTO	SAN DIEGO	SONOMA
Average number of days to close work orders for fume hoods	*	16	40	*
Range for the number of days to close work orders for fume hoods	5 to 74	1 to 352	1 to 533	7 to 105
Total work orders	3	94	106	3

Source: California State Auditor's analysis of records from work order systems provided by the four campuses we reviewed.

Note: Campuses did not always separately track the dates repairs were completed and the dates of the final administrative review. Therefore, the information we present in the table shows the amount of time campuses took to close work orders, which can include the time to complete the repair work and also the associated administrative review.

* For campuses where we identified three or fewer work orders, we have not presented an average due to the limited population size.

We further note that the University Auditor has found problems with San Diego's management of its work order data. Specifically, in a June 2017 audit of San Diego's Facilities Services, the University Auditor identified a concern regarding work orders erroneously remaining open. The University Auditor found that of 10 work orders it reviewed that were open for more than 120 days, San Diego completed nine of the repairs but failed to update its data. This finding mirrors one of the work orders for a fume hood repair that we identified at San Diego, which was open for more than 530 days. When we requested an explanation for why it took nearly a year and a half to close this work order, the campus explained that the work order appeared to take so long to close because it was closed incorrectly within 25 days and the error was corrected over a year later.

To address these inaccuracies in the system data, the University Auditor recommended that San Diego revise its procedures to enhance oversight of work orders, including a review and analysis of aged work orders. In response, in December 2017, San Diego's director of Facilities Services issued a memo requiring Facilities Services to conduct a weekly review of all open work orders and to close any work orders that the review identified should be closed. In addition, in March 2018 an associate director of Facilities Services said that she was working to implement new processes to improve the efficiency of Facilities Services' use of the work order system, such as an automated reminder to contact work order requesters

when work orders become overdue. If San Diego consistently follows its new process to review open work orders, we believe that it will help Facilities Services maintain more accurate data on how long it takes to close work orders for repairing engineering controls.

Some Campuses Did Not Consistently Complete Annual Inspections of Key Ventilation Equipment in Science Buildings

To ensure that the condition of ventilation equipment is regularly checked, state regulations require that employers inspect mechanically driven heating, ventilating, and air conditioning (HVAC) systems at least annually and that they document, among other things, the specific findings of the inspection and the actions they take during the inspection. The regulations also require employers to correct problems found during an inspection within a reasonable time. An integral component of an HVAC system is the air handler unit, which serves to regulate and circulate fresh air. Because a properly functioning air handler unit is critical to ensuring good indoor air quality and because state regulations establish minimum HVAC systems standards to prevent harmful exposure of employees to dusts, fumes, mists, vapors, and gases, we assessed whether the four campuses had completed routinely scheduled preventative maintenance inspections of this component of the HVAC systems located in science buildings on their campuses within annual intervals.

San Diego did not conduct timely annual inspections in 2017 on some of the air handler units we selected for review.

San Diego did not conduct timely annual inspections in 2017 on some of the air handler units we selected for review. We reviewed the inspection records for the selected air handler units from each campus's work order system expecting to see inspections on each unit conducted within 12 months of each other for all three years. However, we found that San Diego did not inspect three of the eight air handler units that we selected at any time in 2017, and it did not inspect one of the five remaining air handler units within 12 months of the previous inspection. San Diego's associate vice president of business operations stated that due to limited resources, Facilities Services was unable to complete all of the scheduled inspections. Without conducting regular inspections of air handler units, campuses risk that this critical ventilation equipment will not operate effectively, which could be detrimental to the health and safety of employees and students working in science buildings.

Sonoma could not demonstrate that it completed preventative maintenance inspections since 2016 on any of the four air handler units we reviewed. Further, it completed three of the four 2016 inspections 13, not 12, months after the previous inspection. Sonoma's associate vice president for administration and finance,

facilities operations and planning (associate vice president) believed, based on conversations with campus engineers, that the air handler units were inspected in 2017 and that the campus's work order system just does not demonstrate those inspections. Sonoma also provided evidence that it had responded to requests for repair of some of the air handler units during 2017. In addition, the campus's current interim associate vice president for facilities services stated that he is assured that the employees and students working in campus buildings will be healthy and safe because campus engineers conduct ongoing visual inspections on the HVAC systems multiple times a week. However, this is different from ensuring that regular preventative maintenance occurs. Sonoma's work control system administrator confirmed that the campus does not currently have preventive maintenance work orders set up in the campus's new work order system. The associate vice president expects that the new system will be fully implemented by about the end of summer 2018. Until it adds preventative maintenance work orders to its new work order system, Sonoma will continue to be at a higher risk of not completing regular maintenance on its air handler units.

Sacramento and Channel Islands had missing records for at least one inspection in the years of our review, although both campuses asserted that the missing inspections had been conducted.

Unlike San Diego and Sonoma, Sacramento and Channel Islands have corrected the issues we observed in our review of their records. Each campus had missing records for at least one inspection in the years of our review, although both campuses asserted that the missing inspections had been conducted. At Sacramento, facilities management's customer service center administrator explained that one of the five air handler units we reviewed was not included in the campus's preventative maintenance schedule until 2016, which meant that the campus had not documented any inspections for that unit before it included this missing information. Additionally, Channel Islands has two science buildings on campus. The three air handler units in one of these buildings were consistently inspected within the annual requirement for the three years of our review. The other science building was first opened in 2015, and the campus's work order system shows that the building has three air handler units. The campus was unable to provide documentation that inspections on these units occurred in 2016 and 2017 after the building's opening. The assistant director of logistical services and maintenance stated that maintenance was recorded on a blanket work order because the campus had not finished setting up the preventative maintenance in its system. However, as of November 2017, the preventative maintenance work orders have been added to the campus's work order system. We believe that both

Sacramento and Channel Islands are likely to consistently conduct these inspections in the future because our review showed that they conducted timely inspections of the other air handler units when they had maintenance work orders in their work order systems.

Most Campuses We Reviewed Did Not Follow Their Policies for Conducting Health and Safety-Related Audits of Laboratories

State law requires every employer to establish and implement a program for effective injury and illness prevention. As a part of that program, state regulations require an employer to include procedures for identifying and evaluating workplace hazards, including scheduled, periodic inspections (self-audits). For laboratories and other locations on campus where hazardous chemicals are stored, these self-audits can include checking the accessibility of key safety equipment, the proper functioning of engineering controls, the proper labeling of chemicals, and the proper design of shelving, among other activities. Although all four campuses we reviewed have procedures for conducting self-audits of laboratories and have identified who is responsible for such reviews, we found that Sonoma, Sacramento, and San Diego did not consistently adhere to their procedures, and Channel Islands had not established an expectation for how often self-audits should be performed.

Sonoma's chemistry department did not conduct regular self-audits in the two rooms we selected during the three-year period we reviewed.

Despite its plan to conduct regular self-audits of its laboratories, Sonoma's chemistry department did not conduct regular self-audits in the two rooms we selected during the three-year period we reviewed. However, we found that its biology department did conduct self-audits in the two rooms we selected during the same period. Sonoma's injury and illness prevention program plan states that inspections of the laboratories, shops, and hazardous material and equipment use areas will occur twice per year. A chemistry support technician stated that he did not know why the department had not completed laboratory inspections for the past three years. However, he stated that the campus's chemical hygiene officer prioritized and created a plan for completing these inspections in Fall 2017.

Although Sonoma's biology department completed self-audits in the rooms we reviewed, these self-audits did not include a step for verifying whether fume hoods had been inspected and eyewashes and showers had been flushed as frequently as state regulations require. The biology instructional support technician explained that she developed the self-audit checklist for use in the biology department, which was then approved by the EH&S director. However, because engineering controls and safeguards are critical to ensure the safety of employees and students working in laboratory settings, we believe a key component of laboratory self-audits should

include steps for verifying whether the campus inspected fume hoods annually and flushed eyewashes and showers monthly as state regulations require. If Sonoma's biology department included this key step when conducting self-audits and if its chemistry department had conducted similarly thorough self-audits, the campus would more likely have identified some of the shortcomings that we found during our review and that we describe in this chapter. Earlier in this chapter, we noted that Sonoma had failed to meet both of these requirements for the laboratories we reviewed.

Further, Sonoma's EH&S office was not adequately ensuring that departments were performing self-audits. Sonoma's injury and illness prevention program establishes procedures for the EH&S office to verify that these self-audits occur and to maintain documentation of its verification. However, its EH&S director stated that the EH&S office does not expect the departments to submit these completed self-audits and that the office has not had the resources to monitor the departments to ensure the self-audits happened. Had Sonoma's EH&S office regularly verified the self-audits, it would have been in a better position to remind the chemistry department to conduct them.

We found that Sacramento and Channel Islands adhered to some, but not all, of their procedures for conducting self-audits. Both campuses expected the departments that use laboratories–such as the chemistry or biology departments—to perform self-audits of those laboratories. However, the departments in question did not all regularly conduct self-audits of the laboratories and chemical stockroom areas we selected for review. Channel Islands' chemical plan does not specify a frequency with which departments must conduct self-audits. When we reviewed the self-audits of selected biology and chemistry stockrooms—where safeguards and engineering controls are present—we found that each room had at least one inspection during the three-year period we reviewed. However, three of the four rooms we reviewed had gaps of at least one year during which Channel Islands completed no self-audits. Channel Islands was the only campus we reviewed that did not specify in its policies an expectation for how often self-audits should be conducted by either its departments or, as we discuss next, its EH&S office. When we discussed expectations about the frequency of self-audits with Channel Islands, the campus indicated that it would consider adding more specific expectations about self-audit frequency when it next updates its chemical plan.

Sacramento's chemical plan requires its departments to complete self-audits once every semester, but this did not occur for the biology laboratories we reviewed.

Similarly, Sacramento's chemical plan requires its departments to complete self-audits once every semester, but this did not occur for the biology laboratories we reviewed. The biology department chair could not explain why the department did not complete self-audits consistently. Although the chemistry department conducted more

frequent reviews of the rooms we selected than Sacramento's chemical plan requires, its self-audits for one of the rooms did not identify that the showers were not always flushed in accordance with state regulation, as we discussed earlier. When departments do not complete self-audits in accordance with their own policies, department officials cannot be sure that they are addressing the safety hazards in their laboratories or areas where chemicals are stored.

These two campuses' EH&S departments performed inspections of the departments in question. Specifically, in addition to the department-level self-audits, Sacramento's injury and illness prevention program states that the campus's EH&S office will conduct annual inspections of departments that use hazardous materials. We found that Sacramento's EH&S office conducted inspections of the biology and chemistry departments at or near the beginning of each school year from 2014–15 through 2016–17. Similarly, although its policy does not specify a frequency, Channel Islands expects its EH&S office to audit compliance with its chemical plan. The EH&S office conducted reviews of laboratory health and safety in each of the three years we reviewed. Although these inspections can serve as a quality control step to ensure that departments are not overlooking critical problems in laboratory settings, we found that these EH&S offices do not conduct these inspections as frequently as the department-level inspections occur and therefore those audits cannot fully substitute for the important inspections that the campuses expect their departments to complete.

San Diego was unable to demonstrate that it completed self-audits as regularly as it expects to.

San Diego was unable to demonstrate that it completed self-audits as regularly as it expects to. San Diego's chemical plan states that EH&S is responsible for performing laboratory inspections, and other department policies state these inspections must be performed on a semiannual basis. However, for the rooms we selected for review, the EH&S compliance specialists at San Diego were not always able to provide documentation that demonstrated they conducted the self-audits. In one case, the specialists were not able to provide records of having audited one of the rooms at any point during the three-year period we reviewed. According to San Diego's EH&S director, San Diego only documents the violations it finds during its self-audits and if no documentation exists, there were no violations observed during the audit. However, San Diego's injury and illness prevention program states that San Diego should keep records of the periodic inspections it conducts. Without such documentation, San Diego is less able to demonstrate that it proactively conducts inspections to identify unsafe working conditions.

Further, San Diego's self-audits did not include a review of whether it flushed key safety equipment in laboratories as frequently as state regulations require. As a result, during these self-audits, San Diego's environmental health and safety compliance specialists would not have identified Facilities Services' failure to complete monthly flushes of eyewash stations and showers, a deficiency we discussed earlier. The EH&S associate director noted that because the campus did not document the dates of flushes on physical tags at each piece of equipment, the compliance specialists would have needed to take additional steps to determine when Facilities Services last flushed each eye wash station and shower. To better facilitate reviewing compliance, in November 2017, San Diego's chemical officer recommended to Facilities Services that the flushing date be documented at the eyewash stations and showers by writing the flushing date on the attached tag. In early March 2018, the director of San Diego's EH&S office indicated that the campus planned to have this process fully implemented by the end of the month. Implementing this process will better assist San Diego in reviewing the frequency of eyewash and shower flushes when it conducts self-audits.

The Campuses We Reviewed Have Not All Consistently Followed State Requirements Regarding Notifications of the Locations of Asbestos

Three of the campuses we reviewed have not consistently notified employees of the locations of asbestos as state law and regulations require. According to the U.S. Occupational Safety and Health Administration, *asbestos*—the name given to a group of minerals that are resistant to heat and corrosion—has been used in various building materials, such as insulation for pipes. However, it is a health hazard and can cause fatal lung diseases. Accordingly, state law requires owners of buildings constructed before 1979 to provide notice to employees working in that building about the presence of asbestos upon learning of it and then annually thereafter. State regulations also require employers to post signs at the entrances of mechanical rooms that contain asbestos or material presumed to contain asbestos. Mechanical rooms are located in multiple buildings on campuses and can include rooms for elevator machines and boilers. Both Sonoma and San Diego complied with state law by providing annual notices to employees regarding the presence of asbestos, but Channel Islands and Sacramento could not locate the documentation for one of the years we reviewed. To gain assurance that those two campuses consistently provide annual notices to employees, we requested documentation for two years prior. Because both campuses were able to provide documentation for the two additional years, we do not believe the lack of documentation was a systemic problem.

However, three campuses—Sacramento, San Diego, and Sonoma—did not consistently comply with the requirement to post warning signs at the entrance of mechanical rooms. This signage is critical because employees may enter mechanical rooms that might contain asbestos. State regulations specify that the signage at the entrance of these rooms must identify the material that is present, its location, and appropriate work practices that, if followed, will ensure that employees do not disturb the material. Without this signage, employees may inadvertently expose themselves to asbestos.

In August 2017, Cal/OSHA issued a citation to Sonoma with several findings related to asbestos, including that Sonoma did not post required signage at the entrance to its mechanical rooms. Initially, Cal/OSHA expected Sonoma to address this violation by September 2017; however, due to reasonable delays, it granted Sonoma several extensions to address this citation and Sonoma informed Cal/OSHA that it had finished addressing it in January 2018, as required. As part of our audit work, we reviewed a selection of five mechanical rooms at Sonoma in January 2018 and found that the campus had posted the required warning signs regarding asbestos at the entrances of the rooms.

Similar to Cal/OSHA's finding at Sonoma, our review of mechanical rooms at San Diego and Sacramento found that these campuses did not consistently post warning signs regarding asbestos at the entrances of the rooms.

Similar to Cal/OSHA's finding at Sonoma, our review of mechanical rooms at San Diego and Sacramento found that these campuses did not consistently post signs at the entrances. We initially identified a mechanical room at Channel Islands on its annual notice list that did not have warning signs at the entrance. However, subsequent to its 2017 annual notice, the campus received test results indicating that no asbestos-containing material was present in the room. The health and safety manager stated that she would remove this room from the annual notice list. We also reviewed two mechanical rooms that San Diego identified as containing asbestos in its annual notice to employees and found that the campus had not posted the required signage at the entrance of either room. When we discussed this with the EH&S director and the facilities services' director, both stated that they were not aware of the requirement to post signs at the entrance of mechanical rooms. The director of the EH&S office stated that EH&S will work with facilities services to begin affixing asbestos warning signs on mechanical room doors, and the EH&S office will assist in selecting the proper signage in order to comply with state requirements. Similarly, we reviewed three mechanical rooms that Sacramento identified as containing asbestos and determined that two did not have the required signage at the entrances. Sacramento's EH&S director agreed that the two rooms required signage at the entrances and subsequently posted signs.

Recommendations

Chancellor's Office

As part of the uniform health and safety-reporting template that we recommend in Chapter 1 that it develop, the Chancellor's Office should require campuses to annually report on the timeliness of their inspections of safeguards, engineering controls, and ventilation systems and identify the reasons for any delays. The Chancellor's Office should follow up with campuses that report untimely inspections and should require that the campuses develop action plans to ensure that they complete inspections as often as state regulations require.

To ensure compliance with state requirements to notify employees about the presence of asbestos, the Chancellor's Office should immediately remind all of its campuses that state regulations require posting signage at the entrances to mechanical rooms that contain asbestos. By September 2018, it should ensure that campuses are compliant with that requirement.

Campuses

Sacramento should monitor the implementation of its new processes for inspecting safeguards to ensure that it completes monthly flushes of eyewashes and showers as state regulations require.

Sacramento should immediately assess the health and safety risks in its art sculpture lab and take action to ensure that safeguards are readily accessible as state regulations require.

San Diego should immediately develop and implement a plan to ensure that it consistently completes its flushes of eyewashes and showers monthly as state regulations require.

Sonoma should continue to implement and adhere to its plan to ensure that it flushes showers and eyewashes and that it inspects fire extinguishers monthly as state regulations require.

Sonoma should add preventative maintenance work orders to its work order system by September 2018 to ensure that it completes fume hood and biosafety cabinet inspections annually as state regulations require.

San Diego should continue to implement its new policy to regularly review open work orders to ensure that it closes work orders in a timely fashion.

San Diego should immediately develop and implement a plan to ensure that it consistently completes its inspections of air handler units at least annually.

By September 2018, Sonoma should begin using its work order management system to track and ensure preventative maintenance inspections of air handler units are completed at least annually.

Channel Islands, Sonoma, and Sacramento should immediately begin following their policies to conduct departmental self-audits to identify and address safety concerns in their laboratories. Channel Islands should amend its chemical plan to include specific expectations about how often departments and its EH&S office will conduct self-audits. Sacramento and Sonoma should ensure that their self-audits review whether timely flushes of eyewashes and showers have occurred. Further, Sonoma's departments should ensure that fume hoods have received annual inspections, and Sonoma's EH&S department should regularly review whether departments are conducting self-audits.

San Diego should ensure that it documents all self-audits it conducts, including when it does not identify any violations during the audit. Additionally, San Diego should continue to implement and follow its new process to include reviews of safeguard inspections as a part of its self-audits.

San Diego and Sacramento should immediately ensure that the entrances to all mechanical rooms with asbestos or material presumed to contain asbestos have signage to inform employees about the presence of the hazardous substance.

We conducted this audit under the authority vested in the California State Auditor by Section 8543 et seq. of the California Government Code and according to generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives specified in the Scope and Methodology section of the report. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Respectfully submitted,

ELAINE M. HOWLE, CPA
State Auditor

Date: April 24, 2018

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For questions regarding the contents of this report, please contact Margarita Fernández, Chief of Public Affairs, at 916.445.0255.

Appendix A

SACRAMENTO APPROPRIATELY RESPONDED TO THE DISCOVERY OF ELEVATED LEVELS OF LEAD IN DRINKING WATER SOURCES ON ITS CAMPUS

As we mention in the Introduction, in March 2016, two Sacramento faculty members began a classroom project that eventually identified high lead levels in a number of campus drinking-water sources. The CSU employees union and members of the Legislature indicated that Sacramento waited 10 months to inform the campus community about the high levels of lead. However, our assessment found that the campus acted appropriately and promptly. Specifically, after testing 42 drinking water sources beginning in March 2016, which continued through that summer, the two faculty members identified one drinking source with elevated levels of lead that, nonetheless, fell below the Environmental Protection Agency (EPA) action level of 15 parts per billion (ppb). In August 2016, the faculty members notified campus officials, who shut off the fountain despite the fact that the lead levels were below 15 ppb and therefore did not require the campus to take any action. In January 2017, at the request of the campus, the faculty members completed a second round of testing that included about 450 drinking water sources and identified 27 sources that had levels of lead above the EPA's action level. Upon being notified, campus officials immediately closed these drinking water sources. The campus then consulted with city and county officials and, less than two weeks after closing the 27 water sources, notified the campus community of the high levels of lead.

The campus also hired a third-party consultant to conduct additional tests of drinking water on campus. Of the 782 sources that the contractor tested, 43 tested over 15 ppb, and Sacramento closed these sources down immediately in May 2017. By July 2017, Sacramento officials had replaced all drinking water sources that had been identified as having high levels of lead. In January 2018, the campus announced that it was in the process of adding labels containing bar codes to drinking fountains on campus. The labels allow the campus community to scan the code and view the most recent test results for that specific drinking fountain. In that same month, after aggregating the data, campus officials concluded that no drinking water sources were now above the EPA action level and that 94 percent of the drinking water sources were at or below the more stringent Food and Drug Administration's guidelines for lead in bottled water. Table A beginning on the following page shows the timeline of events related to the discovery of lead in the campus drinking water supply, including the campus's response.

Table A
Timeline of Key Events Related to Sacramento's Response to the Discovery of Lead in Campus Drinking Water Sources

DATE	SUMMARY OF EVENT	SACRAMENTO'S RESPONSE
March 2016	Two professors from Sacramento began a project in which they and two students sampled 42 drinking water sources at eight buildings on campus. This testing continued through the summer.	
August 12, 2016	The professors first shared with Sacramento's EH&S office the findings from their first phase of the project. None of their results were above the EPA's action level of 15 ppb. However, one fountain had a lead level of 8.86 ppb, which is below the EPA action level but above the recommended level in bottled water according to the Food and Drug Administration (FDA). The professors shared with the campus the results from an independent contractor that verified their results.	Out of caution, the campus shut off the fountain with a lead level of 8.86 ppb.
November 17, 2016 and November 18, 2016	Staff notified the campus president that the EH&S office had conducted additional testing in October 2016 at the Children's Center, a child-care program on campus. The EH&S office reported that it collected 18 samples and that two samples from drinking fountains tested positive for lead, but below the EPA action level.	According to campus officials, the Children's Center staff immediately shut off the fountains even though neither water source tested above the EPA action level.
January 6, 2017 through January 12, 2017	The campus requested, and provided funding for, the professors and their students to conduct a second round of testing. The professors and students tested about 450 water sources, including sinks, drinking fountains, faucets, filtered refrigerator spouts, and bottle-filling stations across campus.	
January 13, 2017	Staff notified the campus president that the additional testing identified 27 drinking water sources with lead levels above the EPA action level of 15 ppb.	According to Sacramento officials, staff immediately shut down all drinking water sources that tested above 15 ppb.
January 17, 2017 through January 24, 2017		Sacramento officials stated that the campus president met with staff from Risk Management Services, one of the professors, and the EH&S office. He also consulted with the county of Sacramento and the city of Sacramento about the steps the campus should take next. The campus kept all drinking water sources over 15 ppb shut down and the campus community was not notified until after consulting with the city and county.
January 25, 2017		The Office of the Vice President for Administration notified the campus community about the results of the additional testing, explaining that campus staff had turned off the identified sources of drinking water that contained elevated levels of lead and that testing would continue, since all sources of drinking water on campus had not yet been sampled. The office also announced that bottled water was available for the campus community at designated locations.
January 26, 2017		The campus hosted a town hall meeting in which a doctor of occupational medicine and a public health officer from the county of Sacramento answered questions.
February 7, 2017		Campus officials posted an update on Sacramento's website explaining that the new interim senior director for risk management services/chief risk officer had been meeting with licensed health and safety consultants to formulate an action plan to address the issues that the water quality testing identified. Further, campus officials stated that in the meantime, it had shut off all drinking water sources.

DATE	SUMMARY OF EVENT	SACRAMENTO'S RESPONSE
February 21, 2017		The Office of the Vice President for Administration updated the campus community by stating that the campus had completed testing of all drinking and food- preparation water sources at all campus dining establishments and that all these sources tested below the EPA action level. California Laboratory Services, a third-party consulting firm, performed the testing and analysis.
February 28, 2017		The Office of the Vice President for Administration updated the campus community by explaining that the campus had hired California Industrial Hygiene Services Inc. (CIH) to perform additional testing and lab analysis of drinking water sources, which would commence in early March and take several weeks.
April 14, 2017		The Office of the Vice President for Administration notified the campus community that the testing of drinking water sources was taking longer than previously anticipated and that the campus expected the testing to be complete by early May.
April 27, 2017		The Office of the Vice President for Administration notified the campus community that campus officials anticipated being able to share the results of the testing and the campus's action plan with the community in the next two weeks and that the campus would be scheduling a campus forum for those who had questions after reviewing the documents. The announcement also provided an update on the results of the testing to date.
May 8, 2017	The results of further testing identified that 43 of 782 drinking water sources had lead levels above the EPA action level.	The Office of the Vice President for Administration shared with the campus community the completed testing results. The campus immediately closed the 43 water sources that had over 15 ppb.
May 15, 2017		The campus hosted an open forum with a public health officer from Sacramento County to discuss the testing results in greater detail.
May through July 2017		The EH&S office replaced the fixtures that were above 15 ppb.
August 23, 2017	The professor continued to sample drinking water sources and found three drinking water sources with lead above the EPA action level.	The Office of the Vice President for Administration sent an announcement to the campus community notifying them that over the summer, a professor and his students collected 300 water samples across campus, and their preliminary results indicated that three drinking water sources contained levels of lead above 15 ppb. Campus officials stated that the campus's Facilities Management shut off the three drinking water sources. The campus announced it would contract with a third-party consultant to test the drinking water sources identified by the professor.
September 29, 2017	CIH reported that the water sources the professor identified as containing levels of lead above the EPA action level were below the EPA action level. The difference in the results were due to differing testing methods. CIH used standard EPA protocol.	
January 10, 2018		The campus aggregated the data generated by water testing CIH performed. The data demonstrated that no drinking water sources were above the EPA action level and 94 percent of the drinking water sources were at or below FDA guidelines for bottled water.
January 16, 2018		The campus announced that a water database was available to the public and described a coding system that Risk Management Services was in the process of installing on the drinking fountains. The coding system allows the public to scan codes on labels placed on the drinking fountains to confirm the drinking water sources' most recent test results.
January 24, 2018		Risk Management Services added labels to nearly all of the drinking water fountains on campus.

Sources: California State Auditor's review of available documentation provided by campus officials and interviews with key staff.

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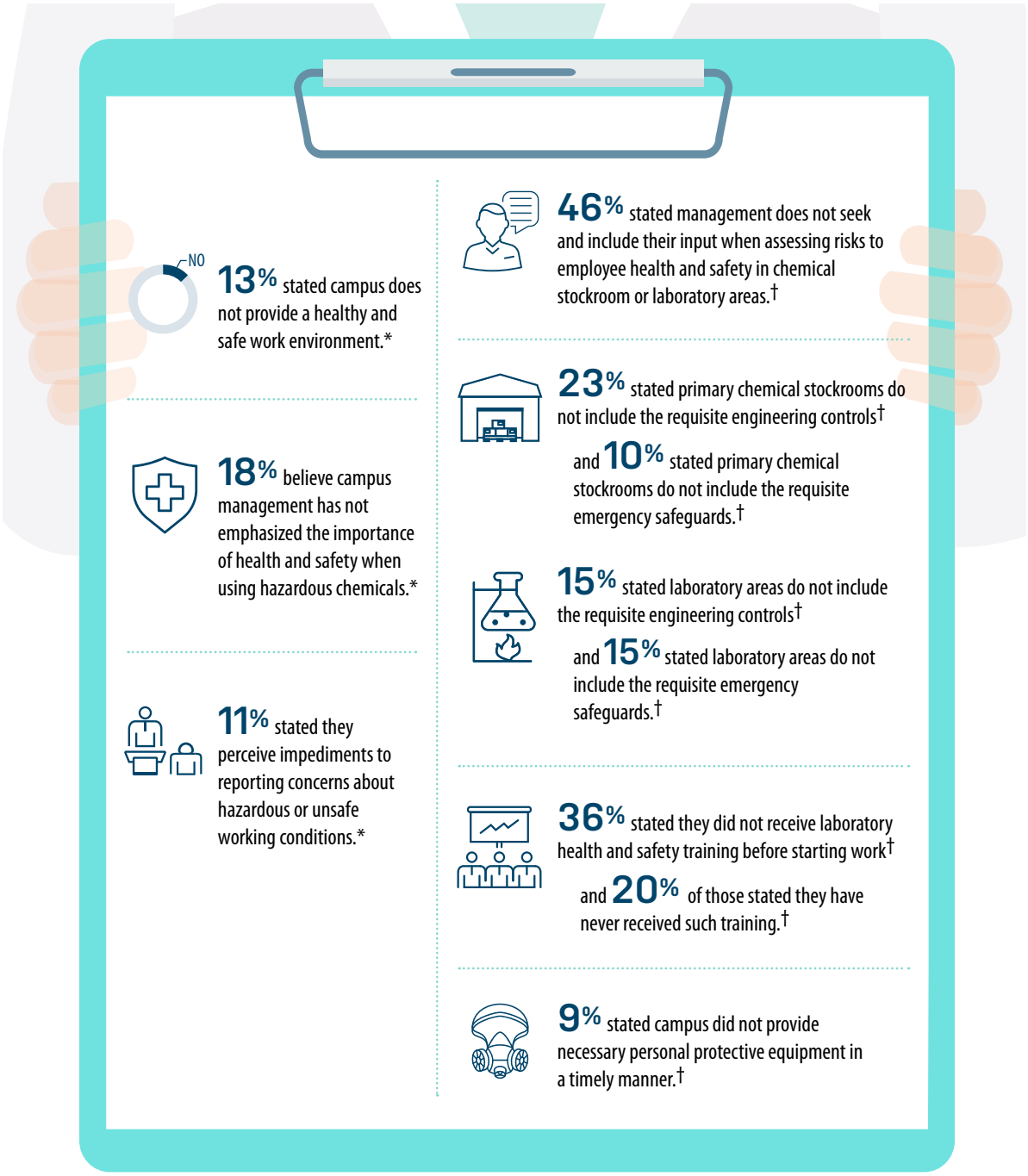
Appendix B

SURVEY OF INSTRUCTIONAL SUPPORT ASSISTANTS AND TECHNICIANS FROM ALL CALIFORNIA STATE UNIVERSITY CAMPUSES

The Audit Committee asked us to survey laboratory instructional support assistants and technicians (support technicians) to obtain a general overview of the health and safety climates at the campuses and to receive staff perspective on laboratory conditions and compliance with existing laws and regulations. We received contact information from the Chancellor's Office for support technicians at all CSU campuses with the exception of California State University Maritime Academy (Maritime). The list with contact information that the Chancellor's Office provided noted that Maritime did not have any support technicians with exposure to hazardous materials, which we confirmed with Maritime's director of risk management. The Chancellor's Office identified 447 support technicians at the remaining 22 campuses whose work exposes them to hazardous materials. Of these 447 individuals, 244—representing all 22 campuses—completed our survey. Figure B on the following page highlights key statistics from the 244 completed surveys.

Figure B
A Snapshot of Our Survey of Support Technicians



Source: California State Auditor's analysis of responses to a health and safety survey it administered to CSU support technicians.

* Based on responses from all 244 respondents.

† Based on responses from 193 support technicians whom the Chancellor's Office indicated worked in biology, chemistry, engineering, physics, and art departments, or whom the Chancellor's Office indicated worked in natural sciences. We present the results for these specific departments because these are the departments on which we focused our audit work.

Overall, the results of our survey indicate that a significant number of those who responded believe that the campuses could do more to establish health and safety as a priority. As Table B.1 on the following page shows, 31 respondents (13 percent) believe that their campuses do not provide healthy and safe work environments. In fact, some individuals commented that they believe their work environments have negatively affected their health. In addition, some respondents stated that their campuses have been slow to respond to or have not followed up on complaints they have made regarding what they believed were hazardous or unsafe working conditions.

Of the 244 respondents, we identified 193 who work in the art, biology, chemistry, engineering, and physics departments at their campuses, as well as others who work in one of the natural sciences, but did not specify which one. For certain questions, we focused on responses from these 193 individuals because our audit work focuses on these departments. According to responses and comments from those 193 support technicians, some believe that their campus has not always provided them with enough resources to ensure their health and safety. For example, one respondent commented that campus officials provided one kit for cleaning chemical spills (spill kit) to her department after she asked for multiple kits on several occasions. According to this support technician, campus officials told the support technician that the department should provide the rest of the spill kits. However, she stated that the department had not bought the additional kits and that some labs still did not have spill kits. Further, 36 percent of the 193 support technicians who indicated they received laboratory safety training stated that the training they had received was either missing important information or ineffective. One support technician explained that the campus does not provide its support technicians the time to attend safety trainings. In fact, she commented that the last time she received safety training was about 20 years ago. She explained that the campus has offered other safety trainings since then, but the trainings have conflicted with her schedule. She noted there were no consequences for not completing safety training, unlike trainings on topics such as sexual harassment. Table B.2 beginning on page 64 presents the responses to key questions specific to the laboratory and chemical stockroom environments that we specifically asked those working in such environments.

Table B.1
Responses to Key Questions of General Applicability

Is your office located inside, or does it include an adjoining door or window to a chemical stockroom?

	ALL DEPARTMENTS		ART		BIOLOGY		CHEMISTRY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	89	36%	4	22%	33	38%	31	65%
No	155	64%	14	78%	54	62%	17	35%

Do you believe your office has adequate ventilation to prevent any harm from the nearby chemicals?†

	ALL DEPARTMENTS		ART		BIOLOGY		CHEMISTRY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	58	65%	4	100%	20	61%	19	61%
No	31	35%	0	0%	13	39%	12	39%

Does the campus have written procedures for instructional support assistants and instructional support technicians to follow in response to an incident (For example, an injury or chemical spill in a chemical stockroom or laboratory area)?

	ALL DEPARTMENTS		ART		BIOLOGY		CHEMISTRY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	167	69%	13	72%	64	74%	32	67%
No	20	8%	0	0%	7	8%	9	19%
I do not know	57	23%	5	28%	16	18%	7	14%

Does the campus define in writing your roles and responsibilities regarding the safety and well-being of students and employees?

	ALL DEPARTMENTS		ART		BIOLOGY		CHEMISTRY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	138	57%	11	61%	52	60%	30	62%
No	39	16%	2	11%	13	15%	11	23%
I don't know	67	27%	5	28%	22	25%	7	15%

Do you perceive any impediments to reporting concerns about hazardous or unsafe working conditions on your campus?

	ALL DEPARTMENTS		ART		BIOLOGY		CHEMISTRY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	28	11%	1	6%	9	10%	10	21%
No	216	89%	17	94%	78	90%	38	79%

Has campus management emphasized the importance of health and safety when using hazardous chemicals?

	ALL DEPARTMENTS		ART		BIOLOGY		CHEMISTRY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	199	82%	15	83%	74	85%	35	73%
No	45	18%	3	17%	13	15%	13	27%

Do you feel the campus provides employees with a healthy and safe work environment when working with or near chemicals or other hazardous materials?

	ALL DEPARTMENTS		ART		BIOLOGY		CHEMISTRY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	213	87%	15	83%	80	92%	38	79%
No	31	13%	3	17%	7	8%	10	21%

Source: California State Auditor's analysis of responses to a health and safety survey it administered to CSU support technicians.

Note: The questions shown in the table are not specific to laboratory and chemical stockroom environments. Therefore, the information presented in this table includes responses from all 244 respondents.

* Includes respondents who, according to the list we received from the Chancellor's office, work in natural sciences but did not specify a department.

† Responses to this question are only shown for the 89 respondents who indicated their office was located inside or included an adjoining door or window to a chemical stockroom.

ENGINEERING		NATURAL SCIENCES*		PHYSICS		OTHER	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
2	17%	0	0%	6	32%	13	25%
10	83%	9	100%	13	68%	38	75%

ENGINEERING		NATURAL SCIENCES*		PHYSICS		OTHER	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
2	100%	0	–	5	83%	8	62%
0	0%	0	–	1	17%	5	38%

ENGINEERING		NATURAL SCIENCES*		PHYSICS		OTHER	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
5	42%	4	44%	14	74%	35	69%
1	8%	1	12%	1	5%	1	2%
6	50%	4	44%	4	21%	15	29%

ENGINEERING		NATURAL SCIENCES*		PHYSICS		OTHER	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
4	34%	2	22%	13	69%	26	51%
1	8%	3	33%	1	5%	8	16%
7	58%	4	45%	5	26%	17	33%

ENGINEERING		NATURAL SCIENCES*		PHYSICS		OTHER	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
1	8%	1	11%	2	11%	4	8%
11	92%	8	89%	17	89%	47	92%

ENGINEERING		NATURAL SCIENCES*		PHYSICS		OTHER	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
11	92%	5	56%	15	79%	44	86%
1	8%	4	44%	4	21%	7	14%

ENGINEERING		NATURAL SCIENCES*		PHYSICS		OTHER	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
12	100%	7	78%	15	79%	46	90%
0	0%	2	22%	4	21%	5	10%

Table B.2
Responses to Selected Questions Specific to Laboratory and Chemical Stockroom Environments

Did the campus provide you training on laboratory health and safety protocols before you began work?

	ALL DEPARTMENTS		ART		BIOLOGY	
POSSIBLE ANSWERS	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	124	64%	9	50%	64	74%
No	69	36%	9	50%	23	26%

How often does the campus provide you training on laboratory health and safety?

	ALL DEPARTMENTS		ART		BIOLOGY	
POSSIBLE ANSWERS	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Have never received training	14	7%	4	22%	2	2%
More than once per year	52	27%	3	17%	26	30%
Once per year	90	47%	9	50%	37	42%
Once every two years	7	4%	0	0%	4	5%
Less than once every two years	30	15%	2	11%	18	21%

How would you rate the training provided to you?†

	ALL DEPARTMENTS		ART		BIOLOGY	
POSSIBLE ANSWERS	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Effective	114	64%	9	64%	55	65%
Adequate but missing some important information	56	31%	4	29%	26	31%
Not effective	9	5%	1	7%	4	4%

Does campus management seek and include your input when assessing risks to employee health and safety in chemical stockroom or laboratory areas?

	ALL DEPARTMENTS		ART		BIOLOGY	
POSSIBLE ANSWERS	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	105	54%	12	67%	43	49%
No	88	46%	6	33%	44	51%

Does the campus provide you with necessary personal protective equipment (e.g. lab coats, gloves, eye protection, ear protection, etc.) in a timely manner to ensure your personal health and safety?‡

	ALL DEPARTMENTS		ART		BIOLOGY	
POSSIBLE ANSWERS	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	173	91%	16	89%	81	93%
No	17	9%	2	11%	6	7%
NA	3	–	0	–	0	–

Do the campus's primary chemical storage areas (chemical stockrooms) include the requisite engineering controls (e.g. supportive storage shelving, air filtration system, fume hoods, etc.) to provide a safe environment?

	ALL DEPARTMENTS		ART		BIOLOGY	
POSSIBLE ANSWERS	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	112	77%	9	75%	49	75%
No	34	23%	3	25%	16	25%
NA§	47	–	6	–	22	–

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
30	63%	4	33%	4	44%	13	68%
18	37%	8	67%	5	56%	6	32%

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
3	6%	3	25%	0	0%	2	11%
18	38%	1	8%	2	22%	2	11%
20	42%	5	42%	5	56%	14	73%
2	4%	0	0%	1	11%	0	0%
5	10%	3	25%	1	11%	1	5%

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
30	67%	6	67%	3	33%	11	64%
14	31%	3	33%	6	67%	3	18%
1	2%	0	0%	0	0%	3	18%

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
25	52%	10	83%	4	44%	11	58%
23	48%	2	17%	5	56%	8	42%

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
43	90%	8	80%	8	89%	17	94%
5	10%	2	20%	1	11%	1	6%
0	–	2	–	0	–	1	–

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
35	76%	3	75%	7	78%	9	90%
11	24%	1	25%	2	22%	1	10%
2	–	8	–	0	–	9	–

continued on next page . . .

Do the campus's laboratory areas include requisite engineering controls (e.g. supportive storage shelving, air filtration system, fume hoods, etc.) to provide a safe environment?

POSSIBLE ANSWERS	ALL DEPARTMENTS		ART		BIOLOGY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	141	85%	11	73%	66	87%
No	24	15%	4	27%	10	13%
NA§	28	–	3	–	11	–

Do the campus's chemical stockrooms include the requisite emergency safeguards (e.g. eyewash stations, showers, fire suppression system, etc.) to provide a safe environment?

POSSIBLE ANSWERS	ALL DEPARTMENTS		ART		BIOLOGY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	138	90%	10	83%	66	96%
No	15	10%	2	17%	3	4%
NA§	40	–	6	–	18	–

Do all laboratory areas include the requisite emergency safeguards (e.g. eyewash stations, showers, fire suppression system, etc.) to provide a safe environment?

POSSIBLE ANSWERS	ALL DEPARTMENTS		ART		BIOLOGY	
	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
Yes	148	85%	13	93%	65	80%
No	26	15%	1	7%	16	20%
NA§	19	–	4	–	6	–

Source: California State Auditor's analysis of responses to a health and safety survey it administered to CSU support technicians.

Note: Based on responses from 193 support technicians whom the Chancellor's Office indicated worked in Biology, Chemistry, Engineering, Physics, and Art departments, or who the Chancellor's Office indicated worked in Natural Sciences. We present the results for these specific departments because these are the departments in which we focused our audit work.

* Includes individuals who, according to the list we received from the Chancellor's office, work in Natural Sciences but did not a specify a department.

† Responses to this question are only shown for the 179 respondents who indicated they had received training on health and safety.

‡ Eleven respondents selected "No" as their response to this question, but either indicated their departments provides them the equipment or commented the campus does provide them with equipment. We have included these individuals' responses with those that answered "Yes" to this question because all 11 indicated they received personal protective equipment. Further, we categorized three responses as not applicable (NA) because respondents commented the question was not applicable to them or their comments made it unclear whether the question applied to them.

§ Respondents stated the question was not applicable to their work.

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
40	85%	7	100%	7	78%	10	91%
7	15%	0	0%	2	22%	1	9%
1	–	5	–	0	–	8	–

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
41	89%	4	67%	6	75%	11	92%
5	11%	2	33%	2	25%	1	8%
2	–	6	–	1	–	7	–

CHEMISTRY		ENGINEERING		NATURAL SCIENCES*		PHYSICS	
RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE	RESPONSES	PERCENTAGE
44	92%	6	86%	7	78%	13	87%
4	8%	1	14%	2	22%	2	13%
0	–	5	–	0	–	4	–

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Appendix C

ENFORCEMENT ACTIONS TAKEN AGAINST THE CAMPUSES WE REVIEWED

The Audit Committee directed us to determine the enforcement actions for health and safety violations levied over the last five years against the Chancellor's Office and the four campuses we reviewed and to identify the agencies that issued such actions. We defined enforcement actions as violations for which enforcement agencies levied a monetary penalty against the Chancellor's Office or one of the four campuses. Enforcement actions can be generated in different ways. For example, Cal/OSHA can issue citations as the result of investigations it conducts of employee complaints or of its targeted inspections. To identify any enforcement actions levied against the Chancellor's Office and the four campuses, we requested that they each provide us with a list of all enforcement actions for the previous five years. To verify that the information they provided was complete, we asked selected enforcement agencies—such as Cal/OSHA and pertinent county hazardous materials divisions—to provide information about the enforcement actions they took against the Chancellor's Office and the four campuses. We determined that no agencies took enforcement action against the Chancellor's Office during the period we reviewed. Agencies took a total of 13 actions against the four campuses during the review period, resulting in total penalties of nearly $48,000. Table C on the following page presents the enforcement actions agencies took against the four campuses that resulted in monetary penalties, the issuing agencies, the years of issuance, the penalty amounts, and brief summaries of the violations. We found that each campus had fully addressed all of the enforcement actions we identify in the table.

Table C
Enforcement Actions Levied Against Selected California State University Campuses Between Fiscal Years 2012–13 and 2016–17

CAMPUS	ISSUING AGENCY	YEAR ISSUED	PENALTY AMOUNT	SUMMARY OF VIOLATION*
Channel Islands	The California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA)	2012	$18,300	The campus did not: • Post a warning sign on an air compressor that could injure employees to warn them that the compressor is automatically controlled and may start at any time. • Post the operating rules for an industrial truck. • Relieve a hot water pipe of internal pressure before opening or dismantling the pipeline, resulting in a valve opening briefly and spraying an employee with hot water, causing second- and third-degree burns.
		2013	640	The campus did not provide effective training regarding its response to heat illness incidents and prevention, and campus staff did not respond appropriately when employees displayed signs and symptoms of heat illness.
Total penalties against Channel Islands			**$18,940**	
Sacramento	Sacramento County, Environmental Management Department, Environmental Compliance Division	2017	$6,610	The campus did not: • Dispose of hazardous waste at an authorized location. • Dispose of hazardous waste within the required time. • Have its spill prevention plan, which helps to prevent oil spills and control spills when they occur, self-certified or certified by a professional engineer. • Review the spill prevention plan within five years of the last review or certification date. • Provide an immediate, verbal report of a release or threatened release of a hazardous material to the Sacramento County Environmental Management Department, Environmental Compliance Division and the California Office of Emergency Services. • Adequately train employees in the handling and management of hazardous waste to ensure that personnel are able to respond effectively to emergencies.
Total penalties against Sacramento			**$6,610**	
San Diego	County of San Diego Air Pollution Control District (district)	2012	$750	• The campus did not report a breakdown in an emergency generator to the district. • Additionally, the breakdown caused the generator to run for more than the 52 hours allowed each year for nonemergency purposes.
		2013	1,000	The campus did not notify the district in a timely manner of a possible breakdown of a gas flow meter in a gas turbine engine.
			1,200	The campus installed a sand blast cabinet— which may cause the issuance of air contaminants—without first obtaining the district's written authorization.
		2014	2,400	The campus did not meet a deadline to input required information into its emissions reporting system.
			1,000	The campus violated an open container regulation by leaving approximately 50 containers of paint containing volatile organic compounds open to dry.
		2015	500	The campus did not provide the district with a timely new notice of a changed start date for a building demolition.
			10,000	The campus installed and operated a gas turbine engine without first submitting an application.
		2017	750	The campus did not conduct periodic maintenance and keep maintenance records in 2015 and 2016 for an emergency generator. The campus also failed to maintain a complete operating log.
Total penalties against San Diego			**$17,600**	

CAMPUS	ISSUING AGENCY	YEAR ISSUED	PENALTY AMOUNT	SUMMARY OF VIOLATION*
Sonoma	Cal/OSHA	2012	$2,240	The campus did not determine if an employee engaged in leaf blowing gutters was exposed to lead, did not establish and implement a written compliance program before the leaf blowing job, and failed to ensure that all surfaces at the worksite were maintained as free as practicable of lead accumulations.
		2017†	2,400	The campus did not: • Determine the quantity of materials that contain or may contain asbestos in various buildings on campus. • Post warning signs regarding asbestos at the entrance of mechanical rooms that contain or may contain asbestos. • Post warning labels on materials that contain or may contain asbestos. • Provide employees performing housekeeping operations in areas that contain or may contain asbestos with annual asbestos awareness training that contained all required elements. • Maintain all surfaces as free as practicable of asbestos containing material waste and debris.
Total penalties against Sonoma			**$4,640**	
Total penalties against the four campuses			**$47,790**	

Sources: California State Auditor's analysis of information provided by the four campuses we reviewed, select enforcement agencies, and interviews with relevant staff.

* We found that all violations in this table have since been resolved by the campuses.

† Cal/OSHA issued this enforcement action early in fiscal year 2017–18; however, we have included it here because Cal/OSHA conducted associated inspections within fiscal year 2016–17 and because citations in the action were related to another audit objective.

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Appendix D

SCOPE AND METHODOLOGY

The Audit Committee directed the State Auditor to examine the extent to which the Chancellor's Office and four selected campuses—Channel Islands, Sacramento, San Diego, and Sonoma—comply with and enforce laws designed to ensure the health and safety of individuals in and around laboratory settings. The Audit Committee requested that we examine nine specific audit objectives to accomplish this task. Table D describes the Audit Committee's objectives and our methodology for addressing each one. The Audit Committee also directed us to conduct a systemwide survey of certain laboratory employees.

Table D
Audit Objectives and the Methods Used to Address Them

	AUDIT OBJECTIVE	METHOD
1	Review and evaluate the laws, rules, and regulations significant to the audit objectives.	Reviewed relevant laws and regulations.
2	For the four selected CSU campuses, determine whether the campuses have adequately defined roles and responsibilities for employee and student safety by determining the following for each campus:	
	a. Whether the campus has a chemical hygiene committee and a joint university safety committee in accordance with state or federal regulations. Also, determine how often these committees meet and whether minutes are taken and made available to employees upon request.	• Obtained policies at all four campuses we visited including those established by each campus's EH&S office. • Interviewed relevant staff and reviewed relevant documentation to determine chemical hygiene committee meeting frequency, topics of discussion, and availability of minutes. • Interviewed relevant staff and reviewed relevant documentation to determine whether a joint university safety committee exists at the system level and at the four campuses that we visited. Determined the meeting frequency, topics of discussion, and availability of meeting minutes for those committees.
	b. Whether the roles and responsibilities for the chemical hygiene officer, laboratory supervisors, and principal investigators are clearly defined, documented, and readily available to ensure worker safety.	Interviewed relevant staff and reviewed documentation to assess whether the roles and responsibilities for the chemical hygiene officer, laboratory supervisors, and principal investigators are clearly defined, documented, and readily available. We determined that all four campuses clearly defined, documented, and made available the roles and responsibilities of their respective chemical hygiene officers, laboratory supervisors, and principal investigators.
	c. Whether the campus has a biosafety committee. If not, assess the appropriateness of not having such a committee.	• Reviewed relevant documentation and interviewed relevant staff to determine whether campuses have a biosafety committee. When applicable, we assessed the appropriateness of a campus not having a biosafety committee. • We identified the requirement that warrants a campus creating a biosafety committee. A biosafety committee is required when the campus receives National Institutes of Health (NIH) funding that it uses to conduct nucleic acid research. We found that only San Diego receives NIH funding for this research and determined that it has a functioning biosafety committee as required.

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	AUDIT OBJECTIVE	METHOD
	d. Whether the campus has qualified radiation and laser safety officers. If not, assess the appropriateness of not having such officers.	• Reviewed relevant laws and regulations to identify the legal requirements to be a qualified radiation or laser safety officer. • State regulations require California Department of Public Health, the agency that issues radioactive materials licenses, to evaluate the designated applicant's radiation safety officer's training and experience. We determined that there are no specific qualifications required for a campus laser safety officer. • Interviewed relevant staff to determine how each campus assesses whether these officers are qualified. • Reviewed supporting documentation related to laser safety training. • We determined that all four campuses we reviewed have a laser safety officer who has received appropriate training. Moreover, having a valid radioactive materials license is an indication that the radiation safety officer specified in the license has adequate training and experience. We found that Sacramento, Sonoma, and San Diego have such licenses and radiation safety officers. Channel Islands does not have a radiation safety officer because it does not have a radiation program that requires such a position.
3	For the four selected campuses, determine whether the campuses ensure adequate availability of safety equipment and monitor the proper operating conditions of such equipment. Specifically, determine the following for each selected campus:	
	a. The extent to which the campus provides and requires proper personal protective equipment (for example, lab coats, goggles, gloves, face masks, shields, etc.) and engineering controls (for example, air filters, fume hoods, snorkels, etc.). Determine how often the engineering controls are checked to ensure effectiveness and adequacy for current working conditions and the average replacement and repair time for such equipment.	• Reviewed state law and regulations regarding personal protective equipment (PPE) and evaluated each campus's policies addressing these requirements. Reviewed relevant state regulations to determine the frequency with which campuses are required to inspect fume hoods and autoclaves, and we assessed whether each campus's policies or inspection records addressed these requirements. • Interviewed relevant campus officials to determine how each campus evaluates employee and student PPE needs, whether the campus provides PPE, and whether the PPE was readily accessible to the employee. • Selected instructors who taught in a laboratory and worked in departments that use chemicals or hazardous materials. Interviewed them to determine whether the campus provided them with PPE. We found that the instructors we selected had adequate access to PPE. • Haphazardly selected courses and students based on whether the campus told us the class required PPE to determine whether they acknowledged the hazards they would encounter in the laboratory. • We judgmentally selected five academic locations where hazardous materials could be used at each campus and identified the three most recent inspections of a selection of engineering controls to determine whether the campuses inspected the engineering controls in those rooms as frequently as state regulations require. • We obtained relevant data from the campuses to calculate the repair time for the engineering controls in laboratory environments. Among the work orders we reviewed, we did not identify any work orders that reflected only the completed replacement of an entire engineering control.
	b. Whether appropriate fire extinguishers, suppression systems, eyewash, emergency showers, and other safeguards are readily available, sufficient for current working conditions, and routinely checked to ensure proper operation.	• Determined how frequently state law and regulations require campuses to inspect fire extinguishers, eyewash stations, and emergency showers. • We judgmentally selected five academic locations where hazardous substances could be used at each campus and identified the three most recent inspections of a selection of safeguards to determine whether the campus inspected the safeguards in these rooms as frequently as state regulations require. We evaluated whether safeguards were readily available to employees and students working in these environments and sufficient for current working conditions.

	AUDIT OBJECTIVE	METHOD
	c. How often, and to what degree, the campus monitors air quality and checks ventilation systems where chemicals are stored and where technicians are near chemicals (for example, stockrooms, employee offices, classrooms, hallways, storage facilities, etc.). Also, assess the method, the frequency, and the extent to which biosafety hoods and autoclaves are inspected and certified.	• Interviewed key facilities officials to determine how often and to what extent each campus monitors air quality and checks ventilation systems where chemicals are stored and where technicians are near chemicals. • Reviewed campus maintenance records for selected air handler units—integral ventilation system components that regulate and circulate fresh air—in campus science buildings. • Reviewed relevant documentation and interviewed key officials and determined that all four campuses demonstrated at least annual inspections for selected autoclaves. We further determined that Sacramento, San Diego, and Channel Islands could provide evidence of required annual inspections of selected biosafety cabinets. We discuss Sonoma's biosafety cabinet inspections on page 39.
4	For the four selected campuses, determine how each campus's procedures and practices for proper storage and safety of equipment ensure the following:	
	a. Whether the campus adequately maintains controlled chemicals (for example, flammable, acid, poison, gas, corrosives, etc.) with appropriate certifications and permits for every location where chemicals are maintained. Also, assess the adequacy of safeguards put in place to prevent unauthorized access to laboratories and storage locations where chemicals are kept.	• Interviewed relevant staff and reviewed relevant documentation to determine whether the campuses had permits or certifications for chemicals or controlled substances. • Identified the safeguards the campuses use to prevent unauthorized access to laboratories and storage locations where campuses keep chemicals and assessed their adequacy. We determined that all four campuses have either policies or procedures that address the storage of chemicals. In addition, all four campuses have safeguards in place to prevent unauthorized access to chemicals.
	b. Whether the campus has properly labeled radiation sources. Also, determine whether the campus follows appropriate procedures to ensure that employees who access radiation sources are properly monitored in accordance with applicable laws and regulations.	• Interviewed relevant staff and reviewed documentation to determine whether the campuses appropriately labeled selected radiation sources and whether they monitored employee exposure to radiation sources. • Our testing found no concerns with how campuses labeled radiation sources and also found that campuses monitored employee exposure to radiation sources.
5	For the four selected campuses, assess the adequacy of each campus's safety program and student and employee access to information and training by determining the following:	
	a. The extent to which employees have access to appropriate information for compliance with California Hazard Communication regulations or other applicable laws, safety data sheets, standard operating procedures, and where this information is located.	• Reviewed state regulations regarding safety data sheets, and assessed if each campus's policies addressed this requirement. • Reviewed a selection of employees who use hazardous chemicals at each of the four campuses to determine whether they received information for compliance with California Hazard Communication regulations through training. • Reviewed the availability of safety data sheets for 10 selected chemicals listed on campus inventories and found that the four campuses made these available to employees. We reviewed the campuses' chemical plans and determined that they included standard operating procedures.

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AUDIT OBJECTIVE	METHOD
b. How and the extent to which the campus provides annual notifications for lead-based paint, asbestos, and other carcinogens to campus employees and students. Also, assess whether areas containing lead, asbestos, and other carcinogens are properly marked.	• Reviewed state law and regulations for required notifications regarding lead-based paint, asbestos, and other carcinogens, and assessed if each campus's policies addressed these requirements. • Interviewed key staff and reviewed relevant documentation to determine if the campuses provided annual notifications for lead-based paint, asbestos, and other carcinogens in the last three academic years. We determined that there is no occupational health and safety legal requirement for campuses to provide annual notifications for lead and other carcinogens. Nevertheless, we found that Sonoma and Channel Islands provide information about the location of lead on their campuses. • To determine whether campuses properly marked areas containing asbestos, we reviewed the signage in up to five mechanical rooms that we judgmentally selected using information provided by the campuses regarding the location of asbestos.
c. Whether the campus has clearly defined the roles and responsibilities of individuals in charge of campus protocols and training for the cleanup of incidences such as chemical spills, dead rodents, mice contamination, bodily fluids, needles, and syringes. Also, determine how the scope of the training is established.	• Interviewed key staff and reviewed relevant documentation to determine the individuals responsible for establishing the protocols and training for cleanup following incidents. • Evaluated campus policies and procedures to determine whether they clearly defined the roles and responsibilities for those charged with establishing protocols and trainings for cleanup following incidents. • Interviewed key staff and reviewed relevant documentation to determine how the campuses established the scope and frequency of these trainings. The four campuses explained that they establish the scope based on relevant regulations. • Evaluated the adequacy of the frequency of trainings related to the cleanup of chemical spills, bodily fluids, needles, and syringes. We did not identify any training requirements for the cleanup of dead rodents and mice contamination. • We determined that all four campuses have clearly defined the roles and responsibilities of individuals in charge of campus protocols and training for such incidents.
d. Whether the campus has a respiratory protection program and whether the program is designed to adequately protect employees and students.	• Identified federal Occupational Safety and Health Administration regulations for respiratory protection programs and assessed if each campus's policies addressed these requirements. The regulations only apply to employees and not students unless they are employed at CSU. • Interviewed key staff about each campus's respiratory protection program. • We determined that all four of the campuses have respiratory protections programs that are designed to adequately protect employees.
e. Whether the campus has a written blood pathogen program and radiation and laser safety program. Also, determine whether the campus has made employees aware of these programs and the extent to which training and competency of employees in these programs is documented.	• Reviewed state regulations regarding campus bloodborne pathogen programs, radiation safety programs, and laser safety programs, and assessed if each campus's policies addressed these requirements. We did not identify any specific training requirements related to employees in the radiation and laser safety programs. • Interviewed key staff and reviewed documentation related to each campus's bloodborne pathogen program, radiation safety program, and laser safety program. • Reviewed the annual training records from the last three years to determine if three selected employees covered under the campus's bloodborne pathogen program received training. Although training is not required, we selected two additional employees from the radiation safety and laser safety programs to determine whether they received training. • We determined that Sacramento, Sonoma, and San Diego have radiation programs, and we determined from our review of a selection of employee training records that the campuses all document the trainings. Channel Islands does not have a radiation safety program because it does not have radiation sources on campus. Similarly, we found that Sonoma, Channel Islands, and San Diego have laser safety programs, and we determined from our review of a selection of employees that most had received training. Although Sacramento has a laser safety program, the campus informed us that nobody is currently enrolled in this program.

	AUDIT OBJECTIVE	METHOD
	f. Whether the campus had adequate policies, protocols, and practices for training and supervising students on the hazards of the laboratory. Also, determine whether students and employees are provided safety training prior to working in the laboratories and are adequately supervised while working in teaching and research labs.	• Reviewed state law and regulations regarding employee training, and assessed if each campus's policies addressed these requirements. We did not identify any legal requirements regarding occupational health and safety training for students unless they are employed at CSU. • Interviewed key staff and reviewed documentation to determine how the campuses train students and employees on the hazards of the laboratory and to determine whether employees are evaluated on their supervision of students. • Reviewed training records for five selected students and five selected employees to determine if they received training in compliance with campus policies for the past three years.
	g. Whether the campus has an ongoing training for quarantine procedures in the event of an outbreak of disease on campus.	• Interviewed key staff and reviewed documentation to determine whether each campus has an ongoing training for quarantine procedures in the event of an outbreak of disease on campus. • There are no requirements for a campus to have these procedures campuswide; however, three of the four campuses have quarantine or disease outbreak procedures or guidelines for their respective health centers. Channel Islands stated that it contracts out its health center activities to the county.
6	For the four selected campuses and the Chancellor's Office, assess the monitoring of compliance with health and safety laws, regulations, policies, and procedures by determining the following:	
	a. Whether the campus performs self-audits in teaching and research laboratories that use potential hazardous chemicals and equipment. If the campus does not perform self-audits, assess its reasons. If the campus performs self-audits, assess the following: i. The appropriateness of the frequency of these self-audits. ii. The appropriateness of the frequency of audits performed by the campus's EH&S office in the areas that use chemicals and equipment to ensure compliance. If no such audits are performed, determine why.	• Reviewed state law and regulations for criteria regarding self-audits and laboratory inspections, and assessed if each campus's policies addressed these requirements. • Interviewed key staff and reviewed relevant documentation to determine if campuses performed self-audits and how frequently they conducted these self-audits. • Reviewed campus policies to determine the frequency of self-audits and laboratory inspections, and assessed if each campus was in compliance with its policies.
	b. Whether the Chancellor's Office and campus EH&S offices have sufficient authority to require compliance with all applicable health and safety standards.	• Reviewed the executive order issued by the Chancellor's Office to determine who is assigned the authority to enforce compliance with health and safety requirements on campus. • Gathered relevant documentation and obtained perspective from officials from the campuses and Chancellor's Office on whether EH&S offices have sufficient authority to require compliance on campus. We determined that the four campuses we reviewed have designated campus officials and EH&S department staff with the authority and responsibility for developing and maintaining campus health and safety programs. Nothing came to our attention to suggest that campus EH&S directors do not have sufficient authority to require compliance with all applicable health and safety requirements.
	c. The enforcement actions levied against the Chancellor's Office and the campuses for health and safety violations during the past five years and the agencies that issued such actions.	• Obtained a list of inspections and citations for each campus and the Chancellor's Office. We also contacted selected enforcement agencies to verify this information and to obtain information about any additional actions they had levied against these entities. • Reviewed the supporting documentation to determine which inspections resulted in enforcement actions with monetary penalties and the resulting outcomes for those enforcement actions.

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	AUDIT OBJECTIVE	METHOD
7	Identify the circumstances and the timeline surrounding when administrators at Sacramento became aware of unsafe levels of lead in the campus drinking water and when the campus community was informed of this hazard. Assess the reasons for any delays in informing the campus community.	Interviewed key staff and reviewed relevant documentation to determine the timeline of events surrounding when administrators at Sacramento were informed of potentially unsafe levels of lead in the campus drinking water.
8	Administer a survey to the laboratory instructional support assistants and technicians of each CSU campus to get a general overview of the health and safety climate at the campuses and to obtain staff perspective on laboratory conditions and compliance with existing laws and regulations.	• Obtained a list from the Chancellor's Office of technicians who were exposed to or handled hazardous chemicals. • Sent the survey to all technicians on the Chancellor's Office list. • Analyzed survey data and identified patterns. • Followed up with selected respondents to obtain additional information to clarify their responses.
9	Review and assess any other issues that are significant to the audit.	We did not identify any other significant issues.

Sources: California State Auditor's analysis of the Audit Committee's audit request number 2017-119, planning documents, and analysis of information and documentation identified in the column titled *Method*.

THE CALIFORNIA STATE UNIVERSITY

OFFICE OF THE CHANCELLOR

BAKERSFIELD
CHANNEL ISLANDS
CHICO
DOMINGUEZ HILLS
EAST BAY
FRESNO
FULLERTON
HUMBOLDT
LONG BEACH
LOS ANGELES
MARITIME ACADEMY
MONTEREY BAY
NORTHRIDGE
POMONA
SACRAMENTO
SAN BERNARDINO
SAN DIEGO
SAN FRANCISCO
SAN JOSÉ
SAN LUIS OBISPO
SAN MARCOS
SONOMA
STANISLAUS

March 29, 2018

Ms. Elaine M. Howle
State Auditor
California State Auditor
621 Capitol Mall, Suite 1200
Sacramento, California 95814

Dear Ms. Howle:

The California State University (CSU) welcomes the opportunity to respond to the draft audit report *California State University: It Has Not Provided Adequate Oversight of the Safety of Employees and Students Who Work with Hazardous Materials* on behalf of the CSU system. This is a consolidated response prepared by the Office of the Chancellor in collaboration with the four CSU campuses your staff visited during the audit: Channel Islands, Sacramento, San Diego, and Sonoma.

The CSU takes seriously the health and safety of all of our employees and students. We are committed not only to providing a healthy and safe environment by complying with applicable laws and regulations, but to fostering a climate of collaboration and transparency to ensure that compliance. Towards that end, the Chancellor's Office plans to conduct health and safety audits at all of the campuses beginning in 2019.

We appreciate the work your office performed to identify the issues outlined in this report and your staffs' willingness to continue to work with us during the response period. We recognize that improvements need to be made and have already begun taking steps to address many of the recommendations. We concur with all of the report's recommendations except for the recommendation regarding campus-level joint health and safety committees (safety committees).

Specifically, we do not agree that the safety committees are required as part of the CSU Collective Bargaining Agreement (agreement) with the State Employees Trades Council. The agreement allows for the establishment of these safety committees, but does not require them to meet regularly. Instead, the agreement states that the safety committees shall meet on a monthly basis or by mutual agreement. It is clear from the language of the agreement that the parties intended that meetings of the safety committees were to be at the discretion of the parties. Furthermore, the campuses have existing committees that discuss health and safety issues, though not in the specific form outlined in the agreement. (1)

Please do not hesitate to contact me if you have questions.

Sincerely,

Timothy P. White
Chancellor

TPW/cs

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* California State Auditor's comment appears on page 81.

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Comment

CALIFORNIA STATE AUDITOR'S COMMENT ON THE RESPONSE FROM THE CSU CHANCELLOR'S OFFICE

To provide clarity and perspective, we are commenting on the response by the CSU Chancellor's Office to our audit. The number below corresponds to the number we have placed in the margin of the Chancellor's Office's response.

We disagree with the Chancellor's Office's belief that campus-level joint committees are not required by the agreement with the union. As we state on page 19 of our report, although the campuses have other committees that may discuss health and safety issues, CSU's agreement with the union requires that each campus have a joint committee consisting of an equal number of management and employee representatives. The Chancellor's Office correctly points out that the agreement does not require these committees to meet regularly, and we explain on page 19 that the agreement states that the campuses' joint committees are to meet on a monthly basis or by mutual agreement. We are disappointed that the Chancellor's Office disagrees with our recommendation and apparently does not see the value in campuses' having these committees. As we state on page 20, by having these committees the campuses could do more to ensure they receive feedback from employee representatives on conditions associated with the campuses' work environments and use this feedback to more effectively recommend interventions—such as specific training based on recent incidents—to relevant stakeholders on campus. ①