

1 STEVE COOLEY, District Attorney  
County of Los Angeles  
2 STANLEY P. WILLIAMS, State Bar No. 106658  
Head Deputy District Attorney  
3 CRAIG W. HUM, State Bar No. 126788  
Deputy District Attorney  
4 201 N. Figueroa Street, 15<sup>th</sup> Floor  
Los Angeles, California 90012  
5 (213) 202-7799

6 Attorneys for Plaintiff

7  
8 SUPERIOR COURT OF THE STATE OF CALIFORNIA  
FOR THE COUNTY OF LOS ANGELES  
9

10 PEOPLE OF THE STATE OF CALIFORNIA,  
11 Plaintiff,  
12 v.

13 THE REGENTS OF THE UNIVERSITY OF  
CALIFORNIA, A PUBLIC CORPORATION,

14 and

15 02 PATRICK HARRAN (7-13-69)

16 Defendants.  
17

Case No.: BA392069

PROSECUTION  
ENFORCEMENT AGREEMENT

ADMINISTRATIVE  
ENFORCEMENT  
TERMS AND CONDITIONS

PENAL CODE SECTION 1385

18  
19  
20 THE PEOPLE OF THE STATE OF CALIFORNIA hereby resolve this prosecution  
21 against defendant 1, the Regents of the University of California (“Regents”) according to the  
22 terms of this Prosecution Enforcement Agreement (“Agreement”). Upon execution of the  
23 Agreement, including the terms and conditions set forth in Appendix A, the People will move to  
24 dismiss with prejudice all filed charges in the criminal action, Case Number BA392069, against  
25 defendant 1, the Regents, pursuant to Penal Code section 1385, in the furtherance of justice.  
26 Defendant 2, Dr. Patrick Harran, is not a party to this Agreement.  
27  
28

1 **I. INTRODUCTION**

2 1. This Agreement is entered into between the Los Angeles County District  
3 Attorney's Office ("LADA"), and the Regents. This Agreement binds the LADA and the  
4 Regents upon the date of execution.

5 2. Appendix A, Cal/OSHA Administrative Enforcement Terms and Conditions, is  
6 incorporated by reference into this Agreement.

7 3. This Agreement is entered into to resolve the LADA's criminal prosecution of the  
8 Regents pursuant to Labor Code section 6425(a), in Case Number BA392069, filed on December  
9 27, 2011, arising out of the work-related death of Regents' employee Ms. Sheharbano Sangji.

10 4. The LADA has determined that entering into this Agreement to resolve the  
11 prosecution of the Regents is appropriate and in furtherance of justice pursuant to Penal Code  
12 section 1385 in light of the following:

13 (a) The Regents' cooperation with Cal/OSHA and the LADA investigation and its  
14 agreement to continue to cooperate with Cal/OSHA and the LADA;

15 (b) The Regents' commitment to maintain a comprehensive laboratory safety program  
16 that is fully compliant with Title 8 and the California Code of Regulations governing employee  
17 health and safety issues in the workplace as set forth in Appendix A;

18 (c) The Regents' promise and obligation to establish a scholarship in the name of Ms.  
19 Sheharbano Sangji as set forth below;

20 (d) The Regents' good faith acceptance of responsibility for conditions under which the  
21 laboratory was operated on December 29, 2008 described in the Statement of Facts set forth in  
22 Section II below, and its remedial actions taken to address and correct laboratory safety issues;  
23 and

24 (e) Collateral Consequences. The effect of a criminal conviction would negatively  
25 impact the University of California as a whole, including the campuses of UC Davis, UC  
26 Berkeley, UC Merced, UC Santa Barbara, UC Riverside, UC Irvine, UC Santa Cruz, UC San  
27 Diego, UC San Francisco<sup>1</sup>, and many thousands of students, employees, and indirectly, the

28 <sup>1</sup> Excluding the clinical enterprises comprising the five health systems at UC Davis, UC Irvine, UC Los Angeles, UC

1 public, including potentially debarment, loss of funding, loss of licenses and exclusion from areas  
2 of research vital to public health, public safety, and national security. Based upon a totality of the  
3 circumstances as articulated in this Agreement, and reviewing the potential collateral  
4 consequences, enforcement of this Agreement (including the terms set forth in Appendix A), best  
5 serves the interests of justice.

6 5. This Agreement shall have full force and effect upon the execution of this  
7 Agreement by the LADA and the Regents (the "Effective Date").

8 6. This Agreement shall be effective and in place for four (4) years (the "Agreement  
9 Term") from the Effective Date.

## 10 **II. STATEMENT OF FACTS**

11 For purposes of this agreement only, the Regents do not dispute the following alleged  
12 facts:

13 1. The California Constitution, Article IX section 9 (a), created the University of  
14 California as a public trust to be administered by the corporation known as "the Regents of the  
15 University of California". The Regents are responsible for administering the University's affairs  
16 and constitute a separate but constituent part of the University.

17 2. In this work-related case, the Regents are the employer, and Ms. Sheharbano  
18 Sangji is the employee. Dr. Harran, the employer's Professor of Chemistry and Principal  
19 Investigator in the laboratory, was Ms. Sheharbano Sangji's direct supervisor in an organic  
20 chemistry laboratory within the Department of Chemistry and Biochemistry at UCLA.

21 3. On December 29, 2008, Ms. Sangji was employed by the Regents in the  
22 Department of Chemistry and Biochemistry at UCLA. Ms. Sangji was working as a research  
23 associate in the organic chemistry laboratory managed by Dr. Patrick Harran. On that date, Ms.  
24 Sangji was in the process of transferring a highly flammable chemical agent, tert-Butyllithium.

---

25  
26 San Diego and UC San Francisco, which are separately regulated enterprises. Additionally, the scope of this  
27 agreement excludes the operations at Lawrence Berkeley National Laboratory which is operated pursuant to a  
28 separate agreement with the U.S. Department of Energy, and at Livermore National Laboratory and Los Alamos  
National Laboratory, both of which are operated by Delaware limited liability companies in which The Regents is a  
member.

1 [T]ert-Butyllithium is a pyrophoric agent (a chemical that ignites when exposed to the  
2 atmosphere) which must be handled only by experienced and properly trained personnel. While  
3 conducting a transfer of tert-Butyllithium, the pyrophoric agent spilled from a syringe that Ms.  
4 Sangji was using to make the transfer. The tert-Butyllithium spilled onto her hands, arms and  
5 torso, and ignited. Ms. Sangji was not wearing a lab coat and was burned on her hands, arms and  
6 torso. On January 16, 2009, Ms. Sangji died from injuries caused by the tert-Butyllithium burns.

7 4. The Cal/OSHA administrative investigation of this matter began in 2009 following  
8 Ms. Sangji's death. As a result of its investigation, Cal/OSHA issued one regulatory and three  
9 serious citations to the Regents on or about May 4, 2009. The total proposed penalty for these  
10 citations was \$31,875. The Regents paid that total monetary penalty.

11 5. Following its administrative investigation, Cal/OSHA determined that pursuant to  
12 the California employee health and safety standards as set forth in the Labor Code and the  
13 California Code of Regulations, Title 8, the Regents had not adequately trained Ms. Sangji to  
14 work with tert-Butyllithium. Cal/OSHA further found that the Regents did not require appropriate  
15 personal protective equipment to be worn for the assigned laboratory project nor had they  
16 established standard operating procedures for transferring pyrophoric agents.

17 6. On December 27, 2011, after a review of the evidence collected by Cal/OSHA and  
18 a further independent evaluation of the controlling law, the LADA filed a complaint alleging  
19 three felony violations of California Labor Code section 6425(a), namely willful violation of an  
20 Occupational Safety & Health standard causing the death of an employee, against the Regents.  
21 The three charged counts allege the Regents' willful: (1) failure to train, supervise, or instruct Ms.  
22 Sangji in the proper handling and operating procedures for working with chemicals in her work  
23 area; (2) failure to implement and maintain an effective Injury and Illness Prevention Program  
24 that include methods and/or work procedures; and (3) failure to require appropriate clothing be  
25 worn for the work being done. See California Code of Regulations, Title 8, Sections 5191(f)(4),  
26 3203(a)(6), and 3383(b).

27 7. In response to the events that caused the death of Ms. Sheharbano Sangji, the  
28 Regents have implemented a comprehensive training and safety compliance program at UCLA.

1 Among these corrective and remedial measures taken, UCLA’s Office of Environmental Health  
2 and Safety (“EH&S”) has produced a safety video setting forth the safe and compliant workplace  
3 practices in the handling and transfer of pyrophorics, including tert-Butyllithium. Standard  
4 Operating Procedures have been established and implemented for researchers working with  
5 hazardous chemical agents; personal protective equipment including fire resistant lab coats is  
6 mandatory for researchers working with pyrophorics. The Regents have made a substantial,  
7 comprehensive, and good faith effort to bring their laboratory safety practices and procedures into  
8 compliance with Title 8 and the California Code of Regulations for employee safety.

9 **III. PROMISES AND OBLIGATIONS OF THE REGENTS**

10 In consideration of the LADA’s dismissal of the criminal action against defendant 1, the  
11 Regents knowingly, voluntarily, and with the advice of counsel agree to the following terms:

12 1. Acceptance of Responsibility for the Statement of Facts. For purposes of this  
13 agreement only, the Regents acknowledge and accept responsibility for the conditions under  
14 which the laboratory was operated on December 29, 2008 as set forth above.

15 2. Agreement that neither it nor any of its counsel, representatives, or executive  
16 employees who have authority to speak publicly on their behalf, will make any public statement  
17 denying responsibility for the conditions under which the laboratory was operated on December  
18 29, 2008.

19 3. Agreement to Establish Sheharbano Sangji Scholarship. The Regents agree to  
20 establish a “Sheharbano Sangji Scholarship” at the University of California, Berkeley Law (Boalt  
21 Hall) for the study of Environmental Law. The scholarship shall be endowed in the amount of  
22 \$500,000.00. Within ninety (90) days of the execution of this Agreement, LADA will meet with  
23 representatives from U.C. Berkeley School of Law as designated by the Regents to establish  
24 qualifications and eligibility. The scholarship is to be funded within one year of the execution of  
25 this Agreement and is to be administered by the Regents.

26 4. Agreement to Pay CAL/OSHA Costs. UCLA shall be responsible for the costs of  
27 any inspections above and beyond the usual number of inspections Cal/OSHA conducted prior to  
28 the execution of this Agreement, not to exceed an aggregate of \$50,000.00, during the Agreement

1 Term. UCLA shall reimburse Cal/OSHA for all costs of inspection within 30 days from the  
2 receipt of an invoice.

3 5. Laboratory Safety – Cooperation and Compliance. The Regents agree to continue  
4 to cooperate fully and actively with the LADA and Cal/OSHA regarding any alleged violation of  
5 Title 8, workplace health and safety rules. The Regents shall:

6 (a) Comply with the terms of Appendix A in cooperation with Cal/OSHA;

7 (b) In response to any inquiry by Cal/OSHA, truthfully disclose and provide all  
8 information, documents, records and other evidence within the Regents' possession, custody, or  
9 control relating to any Title 8 violations; and

10 (c) Exercise due diligence to prevent and detect violations of the Labor Code involving  
11 employee laboratory safety.

12 The Regents agree that it shall, within 120 days of the date of execution of this  
13 Agreement, provide the LADA and Cal/OSHA with a written certification from each Regents'  
14 Campus' EH&S Department, or its equivalent, confirming that it has commenced the  
15 implementation of safe laboratory practices and procedures compliant with Title 8, as set forth in  
16 Appendix A.

17 6. Certification of Compliance. The Regents agree that semi-annually during the  
18 Agreement Term, including between thirty and sixty days before the expiration of the Agreement  
19 Term, the Director of each Regents' Campus' EH&S Department, or its equivalent, shall execute  
20 under penalty of perjury, and provide to the LADA a certification that, to the best of his or her  
21 knowledge, after engaging in due diligence, the specific Regents' Campus is in substantial  
22 compliance with the terms of this Agreement, including the provisions of Appendix A.

#### 23 **IV. PROMISES AND OBLIGATIONS OF LADA**

24 Upon execution of this Agreement, including the terms set forth in Appendix A, the  
25 LADA agrees to move to dismiss with prejudice the criminal action, Case Number BA392069,  
26 against the Regents, and will not pursue any additional criminal charges against the Regents  
27 based on the facts set forth herein.  
28

1 Nothing in this Agreement shall preclude or limit the LADA from bringing a criminal  
2 prosecution against the Regents for making false statements, obstruction of justice, perjury,  
3 subornation of perjury, witness tampering, or aiding and abetting or conspiring to commit such  
4 offenses, based on the Regents' conduct in performing obligations under this Agreement.

5 **V. BREACH OF THE AGREEMENT**

6 It shall constitute a breach of this Agreement for the Regents knowingly to engage in  
7 conduct that constitutes a material failure to substantially comply with any of the promises and  
8 obligations set forth in the Agreement. For purposes of determining substantial compliance with  
9 or breach of this Agreement, conduct by an employee of the Regents that would constitute a  
10 breach of this Agreement if attributed to the Regents shall not be deemed to constitute conduct by  
11 the Regents unless the Vice Chancellor for Research of the Campus learns of that conduct and  
12 fails to initiate curative action within 30 days after learning of it.

13 The LADA shall confer with Cal/OSHA prior to any decisions or determinations with  
14 respect to an alleged breach of this Agreement by the Regents. In the event that the LADA  
15 preliminarily believes that the Regents have breached this Agreement, the LADA shall provide  
16 the Regents with written notice of this preliminary belief and the Regents will have 30 calendar  
17 days from the date appearing on that written notice in which to make a presentation to the LADA  
18 to demonstrate that no breach has occurred or, to the extent applicable, that the breach is not a  
19 knowing breach or has been cured. The LADA shall thereafter provide written notice to the  
20 Regents of their final determination regarding whether or not it will assert a breach has occurred  
21 and has not been adequately cured.

22 Should the LADA determine that it will assert that a breach has occurred and has not been  
23 adequately cured, the LADA may seek a determination, as set forth below, that the Regents are in  
24 breach of the Agreement and seek a penalty of up to \$500,000.00.

25 Any question of whether the Regents have breached the Agreement and, if so, the  
26 appropriate amount of penalty, if any, shall be decided by the Honorable John W. Ouderkirk  
27 (retired) acting as Special Master in such proceedings as he deems necessary. The Special  
28 Master's review of any breach asserted by the LADA shall be de novo, and the LADA shall bear

1 the burden of proof to establish any factual issues, as specified by the Special Master, by a  
2 preponderance of the evidence. There shall be no appeal from the Special Master's decision.

3 Monies from any penalty awarded by the Special Master for a breach of the Agreement  
4 shall be distributed under the doctrine of *cy pres* and in the public interest, to a non-profit  
5 organization designated by the LADA whose mission and organizational purpose is devoted to  
6 workplace safety and the prevention of environmental crimes. The Regents agree to pay all costs  
7 for retaining the Special Master.

8 The Regents agree to make any payment of the penalty decided upon by the Special  
9 Master pursuant to this paragraph within 30 days of notice of the Special Master's decision on the  
10 matter. The Regents' failure to make timely payment will constitute a separate material breach of  
11 this Agreement. Payment of a penalty by the Regents pursuant to this Agreement shall not relieve  
12 the Regents of performing its obligations under this Agreement.

#### 13 **VI. OTHER PROVISIONS**

14 This Agreement is binding on the LADA and on the Regents to the extent provided  
15 herein.

16 The Regents warrant and represent that its undersigned officer is authorized to execute  
17 and deliver this Agreement and has the authority to bind the Regents to its terms. The LADA  
18 warrants and represents that their undersigned representatives are authorized to execute and  
19 deliver this Agreement and bind the LADA to its terms.

20 All notices to the Regents required or permitted by this Agreement shall be in writing and  
21 shall be delivered to the undersigned Counsel of Record for the Regents by first class, postage  
22 prepaid mail, and by facsimile or electronic transmission effective in each case upon the later of  
23 the date of mailing or the date of transmission.



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

**For the PEOPLE:**

---

Craig W. Hum  
Deputy District Attorney  
201 North Figueroa Street, 15<sup>th</sup> Floor  
Los Angeles, CA 90012

---

Stanley P. Williams  
Head Deputy District Attorney  
Consumer Protection Division  
201 North Figueroa Street, 12<sup>th</sup> Floor  
Los Angeles, CA 90012

**For the Regents:**

---

Charles F. Robinson  
General Counsel  
1111 Franklin Street, 8<sup>th</sup> Floor  
Oakland, CA 94607

---

Gene D. Block  
Chancellor, UC Los Angeles  
2147 Murphy Hall  
Los Angeles, California 90095

**DATED: July\_\_\_, 2012**

1 **APPENDIX A**

2 **CAL/OSHA ADMINISTRATIVE ENFORCEMENT TERMS AND CONDITIONS**

3  
4 DEFINITIONS

5 “Regents”, for purposes of Appendix A, includes the campuses of UC Davis, UC  
6 Berkeley, UC Merced, UC Santa Barbara, UC Riverside, UC Irvine, UC Santa Cruz, UC San  
7 Diego, UC San Francisco. It excludes: UC Los Angeles; the clinical enterprises comprising the  
8 five health systems at UC Davis, UC Irvine, UC Los Angeles, UC San Diego and UC San  
9 Francisco, which are separately regulated enterprises; Lawrence Berkeley National Laboratory  
10 which is operated pursuant to a separate agreement with the U.S. Department of Energy; and at  
11 Livermore National Laboratory and Los Alamos National Laboratory, both of which are operated  
12 by Delaware limited liability companies in which the Regents is a member.

13 “UCLA” refers to the University of California, Los Angeles.

14 “Cal/OSHA” means the California Department of Industrial Relations, Division of  
15 Occupational Safety and Health, who promulgated this Appendix (“Appendix A”).

16 The “Cal/OSHA Administrative Enforcement Terms and Conditions” is incorporated by  
17 reference into the Prosecution Enforcement Agreement (the “Agreement”) signed by the Regents  
18 and LADA.

19 **I. ADMINISTRATIVE ENFORCEMENT BY CAL/OSHA**

20 1. The Administrative Enforcement Terms and Conditions shall be effective for a  
21 period of four (4) years from the date of execution of the Agreement.

22 2. The obligations of UCLA and the Regents set forth in Appendix A, Cal/OSHA  
23 Administrative Enforcement Terms and Conditions, shall apply only to all laboratory facilities  
24 within any Department of Chemistry and/or Biochemistry at UCLA and any Regents’ campus.

25 3. Nothing in the Administrative Enforcement Terms and Conditions shall be  
26 construed to limit Cal/OSHA from assessing any fines or penalties as may otherwise be provided  
27 by law.

1           4.       Regents and UCLA shall commit no violations of California Labor Code Sections  
2 6425 and no knowing, non-negligent violations of Labor Code Section 6423.

3 **II.     OBLIGATIONS OF UCLA AND REGENTS**

4           1.       Regents and UCLA shall provide to the LADA and Cal/OSHA Bureau of  
5 Investigation, a list of all laboratory facilities currently in operation, or which become operational  
6 within the term of this agreement. The list shall also designate the department housing each  
7 laboratory, the location of each laboratory, the principal investigator assigned to each laboratory  
8 and the general type of research being undertaken in each laboratory (i.e., Biochemistry,  
9 Chemistry, Organic Chemistry, etc.). UCLA shall provide an interim list of its laboratory  
10 facilities within 90 days from the execution of this agreement and shall provide a final list of all  
11 facilities within 180 days. The Regents shall provide an interim list of its laboratory facilities at  
12 the other nine (9) UC campuses within 180 days from the execution of this agreement and shall  
13 provide a final list of all facilities within 365 days from the execution of this agreement.

14           2.       UCLA and each of the other Regents' campuses shall maintain a formal written  
15 Laboratory Safety Manual and Chemical Hygiene Plan, in full compliance with all applicable  
16 California Code of Regulations, Title 8 Sections, including but not limited to, Sections 5191 and  
17 3203. UCLA and Regents shall ensure that copies of the specific institution's Laboratory Safety  
18 Manual are provided to its laboratories. UCLA and Regents will also ensure that the Laboratory  
19 Safety Manuals are maintained in a visible location within each laboratory and are readily  
20 accessible to all laboratory personnel. Electronically available copies of the Laboratory Safety  
21 Manual are acceptable to meet this provision, provided such manuals are readily accessible to all  
22 laboratory personnel. UCLA and Regents shall make accessible copies of the Laboratory Safety  
23 Manuals, including any revisions made during the term of the Agreement, to the Los Angeles  
24 County District Attorney's Office and Cal/OSHA Bureau of Investigation.

25           3.       UCLA shall require all existing Principal Investigators to complete: (1) a  
26 Laboratory Safety Training program, the subject matter of which provides comprehensive  
27 coverage of the University's Laboratory Safety Manual; this training shall commence within 60  
28 days of the execution of the Agreement, and; (2) formal training covering University policy

1 concerning the Principal Investigator's responsibilities for laboratory safety, including but not  
2 limited to, UCLA policies 811, 905, 907, and the applicable Title 8 regulations governing  
3 laboratory operations including, but not limited to, California Code of Regulations, Title 8,  
4 Sections 5164, 5191, 5194, 3203, and 3380-3387. UCLA shall maintain records for five years of  
5 all Principal Investigators completing the training specified in this section. Laboratory Safety  
6 Training administered after January 1, 2010 may be applied to satisfy subdivision (1) of this  
7 requirement, if the training is certified to meet the subject matter scope of this section and written  
8 records of the training are maintained.

9         3.1. Regents shall require that Principal Investigators complete a laboratory safety  
10 training program, the subject matter of which includes coverage of the relevant campus'  
11 Laboratory Safety Manual. Regents shall ensure that the Laboratory Safety Manuals comply with  
12 all applicable Title 8 regulations governing laboratory operations including, but not limited to,  
13 California Code of Regulations, Title 8, Sections 5164, 5191, 5194, 3203, and 3380-3387.  
14 Individual Laboratory Safety Training administered after January 1, 2010 will satisfy this  
15 requirement, if the training is certified, in writing, that it was conducted in substantial compliance  
16 with this paragraph.

17         4. UCLA shall prohibit any new or visiting Principal Investigator from operating any  
18 laboratory facility, or directing or supervising any employees within any laboratory facility  
19 without first completing its Laboratory Safety Training Program, the subject matter of which  
20 provides comprehensive coverage of the University's Laboratory Safety Manual and additional  
21 training covering University policies concerning the Principal Investigator's responsibilities for  
22 laboratory safety including, but not limited to, UCLA policies 811, 905, 907, and the applicable  
23 Title 8 regulations governing laboratory operations including, but not limited to California Code  
24 of Regulations, Title 8, Sections 5164, 5191, 5194, 3203, and 3380-3387.

25         4.1. Regents shall prohibit any new or visiting Principal Investigator from operating  
26 any laboratory facility, or directing or supervising any employees within any laboratory facility  
27 without first completing the relevant campus' Laboratory Safety Training Program. Regents shall  
28 ensure such training complies with all applicable Title 8 regulations governing laboratory

1 operations including, but not limited to, California Code of Regulations, Title 8, Sections 5164,  
2 5191, 5194, 3203, and 3380-3387.

3 5. UCLA shall require all existing laboratory personnel: (1) to complete a Laboratory  
4 Safety Training program, the subject matter of which provides comprehensive coverage of the  
5 University's Laboratory Safety Manual; this training shall commence within 60 days of the  
6 execution of the Agreement, and; (2) to complete formal training covering University policy  
7 concerning an individual's rights and responsibilities relative to lab safety and the applicable  
8 California Code of Regulations, Title 8, governing laboratory operations including, but not  
9 limited to, Sections 5164, 5191, 5194, 3203, and 3380-3387. UCLA shall maintain for five years  
10 records of all employees completing the training specified in this section. Laboratory Safety  
11 Training administered after January 1, 2010 may be applied to satisfy subdivision (1) of this  
12 requirement, if the training is certified to meet the subject matter scope of this section and written  
13 records of the training are maintained.

14 5.1. Regents shall require laboratory personnel to (1) complete a Laboratory Safety  
15 Training program, the subject matter of which provides comprehensive coverage of the relevant  
16 campus' Laboratory Safety Manual and; (2) complete training covering policy concerning an  
17 individual's rights and responsibilities relative to lab safety and the applicable California Code of  
18 Regulations, Title 8, governing laboratory operations including, but not limited to, Sections 5164,  
19 5191, 5194, 3203, and 3380-3387. This training shall commence within 60 days of the execution  
20 of this Agreement. Individual Laboratory Safety Training administered after January 1, 2010 will  
21 satisfy this requirement if the training is certified, in writing, that it was conducted in substantial  
22 compliance with this paragraph.

23 6. UCLA and Regents shall ensure that all laboratory facilities comply with Title 8's  
24 requirements for Standard Operating Procedures ("SOPs"). Additionally, for any chemical listed  
25 in the Chemical Classification List (attached hereto as "Exhibit 1"), the following shall apply:  
26 SOPs shall be written by laboratory personnel having the most experience and knowledge and  
27 who are routinely involved in the experimental process. The Principal Investigator and all  
28 personnel responsible for performing the procedures detailed by the SOP shall sign the SOP,

1 acknowledging the contents, requirements and responsibilities outlined in the SOP. The SOP  
2 shall be reviewed. The review shall be conducted by qualified personnel. The SOP shall be  
3 amended and subject to additional review and approval by the Principal Investigator where  
4 changes or variations in conditions, methodologies, equipment, or use of the chemical occurs, or  
5 when it is reasonably apparent that exposure to injury or illness may be increased or adversely  
6 effected by any anticipated or an unanticipated condition arises when an approved SOP is  
7 utilized, or where the scale of any reaction or application has increased beyond the capacity of the  
8 equipment or apparatus outlined or described in the original SOP, or the increased scale of any  
9 reaction or application had not been evaluated and approved within the scope of the original SOP.  
10 Authors of SOPs shall consider in developing, revising, and reviewing and approving SOPs, the  
11 usage and handling recommendations provided by the manufacturer.

12 7. A copy of all SOPs relevant to that particular laboratory's operations shall be  
13 maintained in each UCLA and Regents' laboratory in the Laboratory Safety Manual, or  
14 separately designated manual. SOPs shall be in a visible location within each laboratory and  
15 readily accessible to all laboratory personnel. Electronically available copies of the SOPs are  
16 acceptable to meet this provision, provided such SOPs are readily accessible to all laboratory  
17 personnel. The UCLA Laboratory Safety Manual and its appendices and UCLA policies 811,  
18 905, and 907 (or Regents' campus equivalents) shall control the specific procedures to be  
19 undertaken in the development, approval and use of SOPs to the extent the Laboratory Safety  
20 Manual and policies are not inconsistent with this section. To the extent that California Code of  
21 Regulations, Title 8 requires more stringent procedures, Title 8 shall control.

22 8. UCLA shall follow its "Procedures for Safe Use of Pyrophoric Liquid Reagents,  
23 2/2009" when handling pyrophoric liquid reagents. Researchers (including Principal  
24 Investigators) or other laboratory personnel shall not work alone when handling pyrophoric liquid  
25 reagents. These procedures shall be in a visible location within each laboratory where pyrophoric  
26 liquid reagents are utilized and readily accessible to all laboratory personnel. Electronically  
27 available copies of the procedures are acceptable to meet this provision, provided they are readily  
28 accessible to all laboratory personnel.

1           8.1. Regents shall maintain written procedures for the safe use of pyrophoric liquid  
2 reagents. The written procedures shall be made readily available to laboratory personnel who  
3 handle pyrophoric reagents. The procedures shall, at a minimum, follow the UCLA “Procedures  
4 for Safe Use of Pyrophoric Liquid Reagents, 2/2009.” The procedures shall be in a visible  
5 location within each laboratory where pyrophoric liquid reagents are utilized and readily  
6 accessible to all laboratory personnel. Electronically available copies of the procedures are  
7 acceptable to meet this provision, provided they are readily accessible to all laboratory personnel.

8           9. UCLA shall require Principal Investigators to complete independent assessments  
9 as to the adequacy of Personal Protective Equipment afforded to laboratory personnel, relative to  
10 each new or existing procedure utilized within a respective laboratory, in accordance with  
11 applicable MSDS recommendations, manufacturer recommendations, UCLA policy 811, 905,  
12 907, and California Code of Regulations, Title 8, including but not limited to, Sections 5191,  
13 5194, 3380-3387 and 3203. Notwithstanding the regulatory requirements set forth above, or any  
14 other legal requirements not specifically cited herein, the following Personal Protective  
15 Equipment (PPE) policy shall be considered the minimum standard to apply at all times while  
16 working or occupying any laboratory area:

17           a. Full-length pants, or equivalent, and close-toed shoes must be worn at all times by all  
18 individuals that who are occupying the laboratory area. The area of skin between the shoe and  
19 ankle should not be exposed.

20           b. Protective gloves must be worn while utilizing any hazardous chemical, biological or  
21 unsealed radiological material. These gloves must be appropriate for the material being used and  
22 conditions under which such use takes place (i.e. open flame, extreme cold, etc.). The Material  
23 Safety Data Sheet (MSDS) for the material should be referenced when determining the  
24 effectiveness of the type of glove to be used.

25           c. Laboratory coats, or equivalent, are required to be worn while working on, or adjacent  
26 to, all hazardous chemicals, biological or unsealed radiological materials. These laboratory coats  
27 must be appropriately sized for the individual and be buttoned to their full length. Laboratory  
28 coat sleeves, or other forms of acceptable forearm protection, must be of a sufficient length to

1 prevent skin exposure while wearing gloves.

2 d. Flame resistant laboratory coats shall be worn when working with pyrophoric materials  
3 or flammable liquids. Cotton (or other non-synthetic material) clothing must also be worn during  
4 these procedures to minimize injury in the case of a fire emergency.

5 e. Laboratory coats may not be worn outside of a laboratory unless the individual is  
6 traveling directly to an adjacent laboratory work area. Protective gloves must not be worn in any  
7 public area outside of the laboratory (i.e., hallways, elevators, offices). Gloves must also be  
8 removed prior to handling any equipment that could likely result in cross-contamination (e.g.,  
9 telephones, computer work stations, etc.).

10 f. Each department or research unit shall be responsible for providing professional laundry  
11 services as needed to maintain the hygiene of laboratory coats. They may not be cleaned by staff  
12 members at private residences or public laundry facilities. Any clothing that becomes  
13 contaminated with hazardous materials must be decontaminated before it leaves the laboratory.

14 g. Eye protection or equivalent engineering controls must be used while handling any  
15 hazardous chemical, biological or unsealed radiological materials. All eye protection equipment  
16 must be American National Standards Institute (ANSI) approved and appropriate for the work  
17 being done.

18 h. Some operations and procedures may warrant further PPE, as indicated by the MSDS,  
19 the standard operating procedures for the material being used, facility policies, regulatory  
20 requirements, or the UCLA EH&S Laboratory Hazard Assessment Tool. Any additional PPE  
21 shall be made available to each exposed or effected employee prior to implementation of any  
22 operation or procedures.

23 i. Employees shall not bear the cost of any required PPE. Written records shall be  
24 maintained by each laboratory verifying the date of issuance and type of PPE issued, or re-issued,  
25 to each laboratory personnel. Written records shall not be required for disposable PPE that is  
26 readily available in the laboratory (i.e., latex gloves, safety glasses).

27 j. No person shall be permitted to work in or occupy any laboratory area without first  
28 being provided the required Personal Protective Equipment. The Principal Investigator or EH&S



1 personnel, shall remove any person found by the Principal Investigator or EH&S personnel,  
2 working in or occupying any laboratory area without the required PPE, until the required PPE is  
3 obtained and utilized. The Principal Investigator or EH&S personnel shall complete a written  
4 record on a standardized form of any such removal, including the name of the subject removed,  
5 the time, date and location of the event, the person(s) making the removal, the specific  
6 circumstances surrounding the removal and the remedial action taken. The records shall be  
7 maintained by the EH&S Department.

8 10. UCLA through its Office of Environment, Health and Safety shall conduct  
9 comprehensive chemical safety inspections, in accordance with the UCLA Laboratory Safety  
10 Manual, Chemical Hygiene Plan, and California Code of Regulations Title 8. The EH&S  
11 department shall immediately notify the responsible Principal Investigator, or other responsible  
12 lab personnel, of any Critical Deficiency noted during an inspection. Critical deficiencies are  
13 those that can imminently lead to serious injuries or immediately dangerous to life and health.  
14 Such deficiencies shall be immediately corrected. The EH&S Department shall immediately  
15 order the cessation of any activity that constitutes a Critical Deficiency and will take all necessary  
16 action to abate the hazardous condition or activity.

### 17 **III. ENHANCED REPORTING REQUIREMENTS**

18 1. Principal Investigators shall be required to immediately report all recordable  
19 occupational injury or illnesses under Title 8 California Code of Regulations Section 342 to  
20 UCLA EH&S or to Regents' campuses EH&S as applicable. During the term of the Agreement,  
21 UCLA and Regents shall immediately notify the Cal/OSHA Enforcement Unit, via telephone and  
22 e-mail to be provided, of any such recordable occupational injury or illness and shall immediately  
23 notify the Cal/OSHA Bureau of Investigation, via telephone and e-mail to be provided, of any  
24 occurrence. UCLA and Regents shall immediately secure any incident scene from all access and  
25 preserve all evidence until the Cal/OSHA Enforcement Unit AND Cal/OSHA Bureau of  
26 Investigation each responds or each determines that a response is not required. If no response is  
27 provided by either Cal/OSHA Enforcement Unit or Cal/OSHA Bureau of Investigation within 24  
28 hours of when notice is received by Cal/OSHA, that shall be a determination that a response is

1 not required. UCLA and Regents may take all necessary steps to eliminate life/safety issues (i.e.  
2 fire or continued property damage), or environmental risks associated with the occurrence prior to  
3 securing the scene. Any such activities shall, to the extent possible, be documented by UCLA  
4 personnel or Regents' campuses personnel.

5 **IV. CAL/OSHA ENHANCED INSPECTIONS**

6 1. During the term of this Agreement, the Cal/OSHA Enforcement Unit and/or  
7 Cal/OSHA Bureau of Investigation, jointly or severally, at its discretion, shall have full access to  
8 any UCLA or Regents' laboratory facilities for the purposes of conducting inspections to  
9 determine compliance with its terms as set forth herein. The inspections shall be limited to three  
10 annually during the term of the Agreement, with the duration of any inspection to be determined  
11 at the discretion of the Cal/OSHA Enforcement Unit and/or Cal/OSHA Bureau of Investigation,  
12 jointly or severally. Advance notice of an inspection shall not be given to UCLA or Regents'  
13 facility. However, upon arrival at a designated laboratory, Cal/OSHA personnel shall contact the  
14 Regents' campus facility representative or UCLA EH&S representative, to be designated by the  
15 Regents or UCLA, and will permit the representative to be present during the inspection if such  
16 representative is reasonably available. "Reasonably available" shall mean availability within 1  
17 hour of initial contact or attempted contact. Cal/OSHA personnel shall not be precluded from  
18 documenting any observable conditions while at the laboratory or beginning any inspection where  
19 the loss of critical information may, at the determination of Cal/OSHA personnel be likely, while  
20 waiting for the arrival of a representative. UCLA and Regents shall provide all documents,  
21 information and records necessary for the completion any inspection, upon request from  
22 Cal/OSHA personnel.

23 **V. OTHER PROVISIONS**

24 1. Nothing in this Appendix shall be construed to limit the investigative authority of  
25 the Cal/OSHA Enforcement Unit or Cal/OSHA Bureau of Investigation, as may be otherwise  
26 provided by statute.

1 **EXHIBIT 1**

2 **CHEMICAL CLASSIFICATION LIST**

3  
4 **1. Pyrophoric Chemicals**

5 **1.1. Aluminum alkyls:**  $R_3Al$ ,  $R_2AlCl$ ,  $AlCl_2$

6 Examples:  $Et_3Al$ ,  $Et_2AlCl$ ,  $EtAlCl_2$ ,  $Me_3Al$ , Diethylethoxyaluminium

7 **1.2. Grignard Reagents:**  $RMgX$  (R=alkyl, aryl, vinyl X=halogen)

8 **1.3. Lithium Reagents:**  $RLi$  (R = alkyls, aryls, vinyls)

9 Examples: Butyllithium, Isobutyllithium, sec-Butyllithium, tert-Butyllithium,  
10 Ethyllithium, Isopropyllithium, Methyllithium, (Trimethylsilyl)methyllithium,  
11 Phenyllithium, 2-Thienyllithium, Vinylithium, Lithium acetylide ethylenediamine  
12 complex, Lithium (trimethylsilyl)acetylide, Lithium phenylacetylide

13 **1.4. Zinc Alkyl Reagents:**  $RZnX$ ,  $R_2Zn$

14 Examples:  $Et_2Zn$

15 **1.5. Metal carbonyls:** Lithium carbonyl, Nickel tetracarbonyl, Dicobalt octacarbonyl

16 **1.6. Metal powders (finely divided):** Bismuth, Calcium, Cobalt, Hafnium, Iron,  
17 Magnesium, Titanium, Uranium, Zinc, Zirconium

18 **1.7. Low Valent Metals:** Titanium dichloride

19 **1.8. Metal hydrides:** Potassium Hydride, Sodium hydride, Lithium Aluminum Hydride,  
20 Diethylaluminium hydride, Diisobutylaluminum hydride

21 **1.9. Nonmetal hydrides:** Arsine, Boranes, Diethylarsine, diethylphosphine, Germane,  
22 Phosphine, phenylphosphine, Silane, Methanetellurol ( $CH_3TeH$ )

23 **1.10. Non-metal alkyls:**  $R_3B$ ,  $R_3P$ ,  $R_3As$ ; Tributylphosphine, Dichloro(methyl)silane

24 **1.11. Used hydrogenation catalysts:** Raney nickel, Palladium, Platinum

25 **1.12. Activated Copper fuel cell catalysts,** e.g.  $Cu/ZnO/Al_2O_3$

26 **1.13. Finely Divided Sulfides:** Iron Sulfides ( $FeS$ ,  $FeS_2$ ,  $Fe_3S_4$ ), and Potassium Sulfide  
27 ( $K_2S$ )  
28

1           **1.14. Elements:** Phosphorus, Cesium, Lithium, Potassium, Sodium, Sodium Potassium  
2 Alloy (NaK), Aluminum Phosphide (AlP)

3

4   **2.    Water Reactive chemicals**

5           Aluminum alkyl halides

6           Aluminum alkyl hydrides

7           Aluminum alkyls

8           Aluminum borohydride or Aluminum borohydride in devices

9           Aluminum Carbide

10          Aluminum ferrosilicon powder

11          Aluminum hydride

12          Aluminum phosphide

13          Aluminum powder, uncoated

14          Aluminum silicon powder, uncoated

15          Barium

16          Boron trifluoride dimethyl etherate

17          Calcium

18          Calcium carbide

19          Calcium cyanamide with more than 0.1 percent of calcium carbide

20          Calcium hydride

21          Calcium manganese silicon

22          Calcium phosphide

23          Calcium silicide

24          Cells, containing sodium

25          Cerium, turnings or gritty powder

26          Cesium or Caesium

27          Diethylzinc

28          Dimethylzinc

- 1 Ethyldichlorosilane
- 2 Ferrosilicon, with 30 percent or more but less than 90 percent silicon
- 3 Hexyllithium
- 4 Lithium
- 5 Lithium alkyls
- 6 Lithium aluminum hydride
- 7 Lithium aluminum hydride, ethereal
- 8 Lithium borohydride
- 9 Lithium ferrosilicon
- 10 Lithium hydride
- 11 Lithium hydride, fused solid
- 12 Lithium nitride
- 13 Lithium silicon
- 14 Magnesium alkyls
- 15 Magnesium aluminum phosphide
- 16 Magnesium granules, coated, particle size not less than 149 microns
- 17 Magnesium hydride
- 18 Magnesium phosphide
- 19 Magnesium silicide
- 20 Magnesium, powder or Magnesium alloys, powder
- 21 Maneb or Maneb preparations with not less than 60 percent maneb
- 22 Methyl magnesium bromide, in ethyl ether
- 23 Methylchlorosilane
- 24 Phosphorus pentasulfide, free from yellow or white phosphorus
- 25 Potassium
- 26 Potassium borohydride
- 27 Potassium phosphide
- 28 Potassium sodium alloys

- 1 Potassium, metal alloys
- 2 Rubidium
- 3 Sodium
- 4 Sodium aluminum hydride
- 5 Sodium borohydride
- 6 Sodium hydride
- 7 Sodium phosphide
- 8 Stannic phosphide
- 9 Strontium phosphide
- 10 Trichlorosilane
- 11 Zinc ashes
- 12 Zinc phosphide
- 13 Zinc powder or Zinc dust

14

15 **3. Potentially explosive Compound Classes**

16

- 17 Acetylene ( $-C\equiv C-$ )
- 18 Acyl hypohalites ( $RCO-OX$ )
- 19 Azide Organic ( $R-N_3$ )
- 20 Azide Metal ( $M-N_3$ )
- 21 Azo ( $-N=N-$ )
- 22 Diazo ( $=N=N$ )
- 23 Diazosulphide ( $-N=N-S-N=N-$ )
- 24 Diazonium salts ( $R-N_2^+$ )
- 25 Fulminate ( $-CNO$ )
- 26 Halogen Amine ( $=N-X$ )
- 27 Nitrate ( $-ONO_2$ )
- 28 Nitro ( $-NO_2$ )

- 1 Aromatic or Aliphatic Nitramine (=N-NO<sub>2</sub>) (-NH-NO<sub>2</sub>)
- 2 Nitrite (-ONO)
- 3 Nitroso (-NO)
- 4 Ozonides
- 5 Peracids (-CO-O-O-H)
- 6 Peroxide (-O-O-)
- 7 Hydroperoxide (-O-O-H)
- 8 Metal peroxide (M-O-O-M)

9

10 **Explosive Salts:**

- 11 Bromate salts (BrO<sub>3</sub>-)
- 12 Chlorate salts (ClO<sub>3</sub>-)
- 13 Chlorite salts (ClO<sub>2</sub>-)
- 14 Perchlorate salts (ClO<sub>4</sub>-)
- 15 Picrate salts (2,4,6-trinitrophenoxide)
- 16 Picramate salts (2-amino-4,6-dinitrophenoxide)
- 17 Hypohalite salts (XO-)
- 18 Iodate salts (IO<sub>3</sub>-)

19

20 **3.1. Potentially Explosive Chemicals**

- 21 Acetyl peroxide
- 22 Acetylene
- 23 Ammonium nitrate
- 24 Ammonium perchlorate
- 25 Ammonium picrate
- 26 Ba/Pb/Hg azide (heavy metal azides)
- 27 Li/K/Na azide
- 28 Organic azides

- 1 Benzoyl peroxide
- 2 Bromopropyne
- 3 Butanone peroxide
- 4 Cumene peroxide
- 5 Diazodinitrophenol
- 6 Dinitrophenol
- 7 Dinitrophenylhydrazine
- 8 Dinitroresorcinol
- 9 Dipicryl amine
- 10 Dipicryl sulphide
- 11 Dodecanoyl peroxide
- 12 Ethylene oxide
- 13 Lauric peroxide
- 14 MEK peroxide
- 15 Mercury fulminate, Silver fulminate
- 16 Nitrocellulose
- 17 Nitrogen trifluoride
- 18 Nitrogen triiodide
- 19 Nitroglycerine
- 20 Nitroguanidine
- 21 Nitromethane
- 22 Nitrourea
- 23 Picramide
- 24 Picric acid (trinitrophenol)
- 25 Picryl chloride
- 26 Picryl sulphonic acid
- 27 Propargyl bromide (neat)
- 28 Sodium dinitrophenate



- 1 Succinic peroxide
- 2 Tetranitroaniline
- 3 Trinitroaniline
- 4 Trinitroanisole
- 5 Trinitrobenzene
- 6 Trinitrobenzenesulphonic acid
- 7 Trinitrobenzoic acid
- 8 Trinitrocresol
- 9 Trinitronaphthalene
- 10 Trinitrophenol (picric acid)
- 11 Trinitroresorcinol
- 12 Trinitrotoluene
- 13 Urea nitrate

14

15 **4. Acutely Toxic Chemicals**

16

- 17 Abrin
- 18 N-Acetoxy-2-acetylaminofluorene
- 19 Acrolein
- 20 Acryloyl chloride
- 21 Actinomycin D
- 22 Aldicarb
- 23 o-Aminoazobenzene
- 24 2-Aminofluorene
- 25 4-aminopyridine
- 26 Ammonium vanadate
- 27 Anabasine
- 28 Apholate

|    |  |
|----|--|
| 1  | Arsenious Acid, Monosodium Salt  |
| 2  | Arsenic acid   |
| 3  | Arsenic oxide  |
| 4  | Arsenic pentoxide  |
| 5  | Arsenic trioxide   |
| 6  | Barium cyanide   |
| 7  | Benzenethiol or Thiophenol   |
| 8  | Beryllium powder   |
| 9  | N,N-bis(2-chloromethyl)-2-Naphthylamine  |
| 10 | Bromoethyl methanesulfonate  |
| 11 | 1,4-Butanediol dimethylsulfonate   |
| 12 | Calcium cyanide  |
| 13 | Cantharadin  |
| 14 | 2-Chloro-4-dimethyl-amino-6-methylpyrimidine                                       |
| 15 | 2-Chlorophenyl Thiourea  |
| 16 | Copper cyanide   |
| 17 | Cyanide salts  |
| 18 | Cyanogen halide  |
| 19 | Cyclophosphamide (2-bis(2-chloroethyl)-aminotetrahydro-2H-1,3,2- oxazaphosphorine- |
| 20 | 2-oxide)   |
| 21 | Dichloromethyl ether   |
| 22 | Dichlorophenylarsine   |
| 23 | Diethyl-arsine   |
| 24 | Digalen  |
| 25 | Digifolin  |
| 26 | Digoxin  |
| 27 | 7,12-Dimethylbenze[a]anthracene  |
| 28 | 3,3'-Dimethoxybenzidine  |

|    |   |
|----|---|
| 1  | 3,3'-Dimethylbenzidine                  |
| 2  | Dimethylethylenimine                    |
| 3  | 1,2-Dimethylhydrazine                   |
| 4  | 3,3'-Dimethoxybenzidine dihydrochloride |
| 5  | 2,4-Dinitrophenol                       |
| 6  | 1,4-Dinitrosopiperazine                 |
| 7  | Duboisine                               |
| 8  | Ethionine                               |
| 9  | Ethyl cyanide                           |
| 10 | Ethylenimine                            |
| 11 | Ethylene glycol dinitrate               |
| 12 | Ethyl methanesulfonate                  |
| 13 | Fluoroacetamide                         |
| 14 | Fluroacetic acid                        |
| 15 | Gitalin                                 |
| 16 | Heroin                                  |
| 17 | Hydrazoic acid                          |
| 18 | Hydrogen cyanide                        |
| 19 | N-Hydroxy-2-acetylaminofluorene         |
| 20 | Hyoscyamine                             |
| 21 | Inorganic arsenic                       |
| 22 | Isobenzan                               |
| 23 | K-Strophanthin                          |
| 24 | Lanatoside                              |
| 25 | Lysergic acid diethylamide              |
| 26 | 3-Methylcholanthrene                    |
| 27 | Methyl chloromethyl ether               |
| 28 | 4,4'-Methylene bis-(2-chloraniline)     |

- 1 Methylhydrazine
- 2 Methyl methanesulfonate
- 3 Nickel cyanide
- 4 Nicotine salicylate
- 5 N-[4-(5-Nitro-2-furyl)-2-thiazoly]-formamide
- 6 Nitroglycerin
- 7 N-Nitroquinoline-1-oxide
- 8 N-Nitrosodimethylamine
- 9 N-Nitroso-N-methylurethane
- 10 Pantopon
- 11 Parathion
- 12 Paroxon
- 13 Phenyl-Arsinous dichloride
- 14 Phenyl Thiourea
- 15 Phosphorodithioic acid
- 16 Phosphorous (Yellow)
- 17 Potassium cyanide
- 18 Propylenimine
- 19 2-Propylpiperidine
- 20 Ricin
- 21 Scopolamine
- 22 Sarin
- 23 Silver cyanide
- 24 Sodium Azide
- 25 Sodium Selenate
- 26 Sodium cyanide
- 27 Sulfotepp
- 28 Tabun

- 1 Tepp
- 2 2,3,7,8-Tetrachlorodibenzofuran
- 3 Tetraethyl lead
- 4 Tetramethyl Ammonium Hydroxide
- 5 Thallic oxide
- 6 Thallium(I) selenite
- 7 Thallium(I) sulfite
- 8 Thimet
- 9 Thiophenol
- 10 m-Toluenediamine
- 11 Uracil mustard
- 12 Vanadium pentoxide
- 13 Zinc cyanide
- 14 Zinc phosphide

15

16 Compounds with a high level of acute toxicity are defined by LD50 and LC50 levels.

| 17 Oral LD50<br>(Rats, per<br>18 kg) | Skin Contact<br>LD50<br>(Rabbits, per<br>19 kg) | Inhalation<br>LC50 (Rats,<br>ppm for 1 h) | Inhalation<br>LC50 (Rats,<br>mg/m <sup>3</sup> 1 h) |
|--------------------------------------|---|---|---|
| 20 < 50 mg                           | < 200 mg  | < 200                                     | < 2000  |

21

22 **5. Acutely Toxic Gases**

- 23
- 24 Ammonia
- 25 Arsenic pentafluoride
- 26 Arsine
- 27 Boron trichloride
- 28 Boron trifluoride

- 1 Carbon Monoxide
- 2 Cyanogen
- 3 Cyanogen chloride
- 4 Chlorine
- 5 Diazomethane
- 6 Diborane
- 7 Fluorine
- 8 Germane
- 9 Hexaethyl tetraphosphate
- 10 Hydrogen bromide
- 11 Hydrogen chloride
- 12 Hydrogen fluoride
- 13 Hydrogen sulfide
- 14 Hydrogen selenide
- 15 Methyl mercaptan
- 16 Nitric oxide
- 17 Nitrogen dioxide
- 18 Nitrogen Tetroxide
- 19 Oxygen difluoride
- 20 Phosgene
- 21 Phosphine
- 22 Phosphorus pentafluoride
- 23 Selenium hexafluoride
- 24 Silicon tetrafluoride
- 25 Stibine
- 26 Sulfur tetrafluoride
- 27 Trimethylsilyldiazomethane
- 28

1 6. Peroxide Forming Chemicals

2  
3 **6.1. Class 1:** These chemicals form peroxides after prolonged storage. These  
4 chemicals should be tested for the formation of peroxides on a periodic basis.

5  
6 Divinyl Acetylene

7 Divinyl Ether

8 Isopropyl Ether

9 Sodium or Potassium Amide

10 Vinylidene Chloride (1,1-dichloroethylene)

11 Potassium metal

12  
13 **6.2. Class 2:** Chemicals that form explosive levels of peroxides when concentrated  
14 through distillation, evaporation or exposure to air after opening.

15  
16 Cyclohexene

17 Cyclopentene

18 Decalin

19 Diacetylene (gas)

20 Dicyclopentadiene

21 Diethyl ether (ether)

22 Dioxane

23 Ethylene glycol dimethyl ether (glyme)

24 Ethylene glycol ether acetates

25 Furan

26 Methyl Isobutyl Ketone

27 Methyl Acetylene (gas)

28 Methyl Cyclopentane

- 1 Tetrahydrofuran (THF)
- 2 Tetralin (tetrahydronaphthalene)
- 3 Vinyl ethers.

4

5 **6.3. Class 3:** Chemicals which are a hazard due to peroxide initiation of  
6 polymerization. When stored in a liquid state, the peroxide forming potential increases  
7 significantly.

- 8
- 9 Acrylic acid
- 10 Acrylonitrile
- 11 Butadiene
- 12 Chlorobutadiene
- 13 Chloroprene
- 14 Chlorotrifluoroethylene (gas)
- 15 Methyl Methacrylate
- 16 Styrene
- 17 Tetrafluoroethylene (gas)
- 18 Vinyl Acetate
- 19 Vinyl Acetylene (gas)
- 20 Vinyl Chloride (gas)
- 21 Vinyl Pyridine
- 22 Vinylidene chloride

23

24 **7. Strong Corrosives**

25

26 **7.1. Strong Acids**

- 27 Hydrobromic acid
- 28 Hydrochloric acid



1 Hydrofluoric acid

2 Nitric acid

3 Perchloric acid

4 Sulfuric acid

5

6 **7.2. Strong Bases**

7 Barium hydroxide

8 Calcium hydroxide

9 Lithium hydroxide

10 Potassium hydroxide

11 Rubidium hydroxide

12 Sodium hydroxide

13 Strontium hydroxide

14

15 **8. Strong Oxidizing Agents** (These can also be grouped: perchlorates, peroxides,  
16 permanganates, nitrates, etc.)

17

18 Ammonium perchlorate

19 Ammonium permanganate

20 Barium peroxide

21 Bromine

22 Calcium chlorate

23 Calcium hypochlorite

24 Chlorine trifluoride

25 Chromium anhydride

26 Chromic acid

27 Dibenzoyl peroxide

28 Fluorine

- 1 Hydrogen peroxide
- 2 Magnesium peroxide
- 3 Nitrogen trioxide
- 4 Oxygen
- 5 Perchloric acid
- 6 Potassium bromate
- 7 Potassium chlorate
- 8 Potassium peroxide
- 9 Propyl nitrate
- 10 Sodium chlorate
- 11 Sodium chlorite
- 12 Sodium perchlorate
- 13 Sodium peroxide
- 14
- 15 **9. Strong Reducing Agents** (Most of these if not all are water reactive chemicals)
- 16
- 17 Barium
- 18 Calcium
- 19 Lithium
- 20 Lithium aluminum hydride
- 21 Magnesium
- 22 Potassium
- 23 Sodium
- 24 Sodium borohydride
- 25
- 26 **10. Regulated Carcinogens**
- 27
- 28 2-Acetylaminofluorene

|    |                          |
|----|--------------------------|
| 1  | Acrylonitrile            |
| 2  | Actinolite               |
| 3  | 4-Aminodiphenyl          |
| 4  | Amosite                  |
| 5  | Anthophyllite            |
| 6  | m-Arsenic Acid           |
| 7  | o-Arsenic Acid           |
| 8  | Arsenic Acid Hemihydrate |
| 9  | Arsenic Disulfide        |
| 10 | Arsenic, Inorganic       |
| 11 | Arsenic Pentoxide        |
| 12 | Arsenic Tribromide       |
| 13 | Arsenic Trichloride      |
| 14 | Arsenic Trifluoride      |
| 15 | Arsenic Triiodide        |
| 16 | Arsenic Trioxide         |
| 17 | Arsenic Triselenide      |
| 18 | Arsenic Trisulfide       |
| 19 | Arsenical Dip            |
| 20 | Arsenious Acid           |
| 21 | Asbestos                 |
| 22 | Benzene                  |
| 23 | Benzidine                |
| 24 | 1,3-Butadiene            |
| 25 | Cadmium & Cd compounds   |
| 26 | Cadmium Acetate          |
| 27 | Cadmium Bromide          |
| 28 | Cadmium Carbonate        |

- 1 Cadmium Chloride
- 2 Cadmium Cyanide
- 3 Cadmium Fluoride
- 4 Cadmium Hydroxide
- 5 Cadmium Iodide
- 6 Cadmium Nitrate
- 7 Cadmium Oxide
- 8 Cadmium Potassium Cyanide
- 9 Cadmium Selenate
- 10 Cadmium Selenide
- 11 Cadmium Stearate
- 12 Cadmium Sulfate
- 13 Cadmium Sulfide
- 14 Cadmium Telluride
- 15 Cadmium Tungstate
- 16 Cadmium-Copper Alloy
- 17 Calcium Arsenate
- 18 Calcium Arsenite
- 19 Chloroethylene
- 20 bis(Chloromethyl)ether
- 21 Chloromethylmethylether
- 22 Chrysotile
- 23 Cobalt (II) Arsenate
- 24 Coke oven emissions
- 25 Copper (II) Acetoarsenite
- 26 Crocidolite
- 27 Cupric Acetoarsenite
- 28 Cupric Arsenite

- 1 1,2-Dibromo-3-chloropropane
- 2 3,3'-Dichlorobenzidine
- 3 4-Dimethylaminoazobenzene
- 4 N,N-Dimethylnitrosoamine
- 5 Disodium Arsenate
- 6 Disodium Hydrogen Arsenate
- 7 Donovan's Solution
- 8 Ethylene Oxide
- 9 Ethyleneimine
- 10 Formaldehyde
- 11 Fowler's Solution
- 12 Gallium Arsenide
- 13 Inorganic Arsenic
- 14 Lead Arsenate
- 15 Lead Arsenite
- 16 Magnesium Arsenate
- 17 Methylchloromethylether
- 18 Methylene chloride
- 19 4,4'-Methylenedianiline
- 20 Monochlorodimethylether
- 21 2-Naphthylamine
- 22 alpha-Naphthylamine
- 23 beta-Naphthylamine
- 24 4-Nitrobiphenyl
- 25 N-Nitrosodimethylamine
- 26 Paraformaldehyde
- 27 Potassium Arsenate
- 28 Potassium Arsenite

- 1        beta-Propiolactone
- 2        Sodium Arsenate
- 3        Sodium Arsenite
- 4        Talc (containing asbestos fibers)
- 5        Tremolite [asbestiform]
- 6        Trisodium Arsenate Heptahydrate
- 7        Vinyl Chloride
- 8        Vinyl Cyanide
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28