HAZARDOUS WASTE SOURCE REDUCTION AND MANAGEMENT PLAN (SB14)

California Code of Regulations
Title 22, Chapter 30, Article 6.1
Section *66520* et seq.

CONTENTS

This Hazardous Waste Source Reduction and Management Review plan contains *5* parts:

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Part 1

SOURCE REDUCTION EVALUATION REVIEW AND PLAN
California Code of Regulations Section 66523.1

This Source Reduction Evaluation Review and Plan has been prepared by California State University, Fullerton (CSUF) in accordance with California Code of Regulations (CCR) Section 66520 et. seq. The numbered and lettered sections of this Review and Plan correspond to the numbers and letters contained in CCR Section *66523.1*. Certification pursuant to Section *66525* is contained in Part *5*.

(a) **Campus name:** California State University, Fullerton

Campus address: 800 North State College Blvd.
Fullerton, CA 92634

(b) **SIC code:** 8221: Educational Services - Colleges and Universities

(c) **Type of business or activity:** Educational Services-Colleges and University

(d) **Length of time California State University, Fullerton has been in business:** 46 years

In 1957, California State University, Fullerton became the 12th State College in California to be authorized by the Legislature. Orange County State College started classes in September 1959. The name changed to Orange State College in July 1962, to California State College at Fullerton in July 1964, to California State College, Fullerton in July 1968 and to California State University, Fullerton in June 1972.

(e) **Major products manufactured or services provided and, if appropriate, their general applications or examples of their applications or end use.**

No products manufactured
Education of undergraduate and graduate students

(f) **Number of employees:** 3400 Faculty and Staff
Number of students: 32,000 Full and part time students
22,000 Full Time Equivalent (FTE) students

(g) **General description of site operations with corresponding block diagrams focusing on quantity and type of hazardous wastes, raw materials, and final products produced at the site:**

California State University, Fullerton is an educational institution. Hazardous waste is generated in its academic facility, and administrative operations. CSUF has over 150 educational and research laboratories, shops and studios using numerous research and educational techniques in each area. As such, each technique cannot be described in detail. Hazardous waste generated by laboratories and facilities on campus are accumulated at a 90 day waste storage facility. All waste is characterized and stored based upon its compatibility prior to disposal.

The waste streams generated on campus may include several California Waste Codes. The actual point of generation of individual California Waste Codes cannot be provided therefore. The general types of waste streams and quantities are provided below (see Attachments (g)1 thru (g) 5), and this source reduction evaluation and plan is based on these waste streams. The University does not produce any products.

(h) Routinely generated hazardous waste streams in the current reporting year which result from ongoing processes or operations that have a yearly volume, or comparable weight, exceeding five percent of the total yearly volume or comparable weight, or, for extremely hazardous waste, five percent of the total yearly volume or comparable weight.

This document does not address the following waste streams, which are exempted under CCR Section *66521:*Infectious waste, radioactive waste (unless mixed with chemical waste), asbestos, PCB's, fluorescent light tubes and automotive fluids including waste oil and various exempted waste streams which are less applicable.

As stated in (g) above, waste volumes or weights are compiled for waste streams rather than individual waste code because each waste stream may include several waste codes for which separate quantities can not be calculated.

1998 (Base Year) Values:

Total volume or weight of hazardous waste generated by CSUF in all categories in 1998: 22.7 Tons

Total volume or weight of SB14 hazardous waste generated in 1998: 9.2 Tons

Percentage of SB14 hazardous waste generated in 1998: 40.5 %

2002 Values:

Total volume or weight of hazardous waste generated by CSUF in all categories in 2002: 33.3 Tons

Total volume or weight of SB14 hazardous waste generated in 2002: 10.5 Tons

Percentage of SB14 hazardous waste generated in 2002: 31.5 %

Individual Waste Streams Generated in 1998, 2002:

waste	pounds	gal	category	totals	CA waste codes
1998					
corrosive liquids	*1,237*	135	CL	1,237	791
corrosive solids	12		CS	12	181
arsenic compounds	10		EH		721
bromine	23		EH		791
cyanides	11		EH		711
mercury	10		EH		725
mercury compounds	*209*	25	EH		181
zinc cyanide	15		EH	278	711
anti-freeze	*495*	55	Exempt		134
asbestos	6,770		Exempt		151
batteries	165		Exempt		181,141
demolition waste	980		Exempt		352
oil	*2,544*	305	Exempt		221
PCB's	1,654		Exempt		261
sulfuric acid spill	*10,008*	1,200	Exempt	22,616	791
flammable liquids	2,517	150	FL	2,517	212
flammable solids	10		FS	10	153
inorganic liquid	410		IL	410	134
inorganic solids	60		IS	60	141
ammonium hydroxide	335		Lab Pack		551
ammonium thiosulphite, acetic acid	250		Lab Pack		551
ammonium thiosulphite, silver	*1,418*	170	Lab Pack		551
carbon disulfide	15		Lab Pack		551
cloroform	*779*	70	Lab Pack		551
gasoline	*209*	25	Lab Pack		551
helium	100		Lab Pack		551
hydrochloric acid	390		Lab Pack		551
lab pack	1,350		Lab Pack		551
other	45		Lab Pack		551
picric acid	9		Lab Pack		551
potassium permanganate	320		Lab Pack		551
sulfuric acid	1,312		Lab Pack		551
sulpher dioxide	15		Lab Pack		551
xylene	1,133		Lab Pack	7,680	551
aerosols	*57*	5	Other		331
pesticides	283		Other		232
resin	500		Other	840	272
organic liquids	313		OL	313	343
organic solids	1,635		OS	1,635	331
paint	*3,545*	425	Paint	3,545	331
total	41,153	2,565		41,153	
tons	20.58	10.70		20.58	
waste - exempt	9.27				

waste	pounds	gal	category	totals	CA waste codes
2002					
corrosive liquids	346		CL	346	791
corrosive solids	48		CS	48	181
acrylonitrile	104		EH		271
arsenic compounds	43		EH		721
benzyl chloride	10		EH		791
bromide	16		EH		791
chlorosulfonic acid	9		EH		791
cyanides	19		EH		711
mercury	228		EH		725
mercury compounds	127		EH		181
phosphorous oxychloride	9		EH		791
phosphorous pentasulfide	8		EH		141
phosphorous trichloride	9		EH		791
sulfuryl chloride	11		EH		791
titanium tetrachloride	27		EH	620	791
anti-freeze	*1,835*	220	Exempt		134
asbestos	2,900		Exempt		151
diesel	*3,278*	393	Exempt		221
filters	600		Exempt		352
oil	*5,296*	635	Exempt		221
other	*20,850*	2,500	Exempt		134
PCB's	2,302		Exempt	37,061	261
flammable liquids	4,593		FL	4,593	212
flammable solids	343		FS	343	153
inorganic liquids	1,265		IL	1,265	134
inorganic solids	771		IS	771	141
amines	336		Lab Pack		551
chlorosilanes	8		Lab Pack		551
diallyamine	8		Lab Pack		551
epichlorohydrin	8		Lab Pack		551
ethylene chlorohydrin	9		Lab Pack		551
formaldehyde	220		Lab Pack		551
hydrazine hydride	6		Lab Pack		551
hydrogen peroxide	7		Lab Pack		551
lab pack, misc.	3,989		Lab Pack		551
lab pack, misc.	*917*	110	Lab Pack		551
methyl iodide	18		Lab Pack		551
methyl vinyl ketone	6		Lab Pack		551
methylene chloride	143		Lab Pack		551
organic peroxide	6		Lab Pack		551
organometallic compounds	8		Lab Pack		551
other	55		Lab Pack		551
oxidizing liquids	1,192		Lab Pack		551
pentachlorophenol	7		Lab Pack		551
peroxide	6		Lab Pack		551
picric acid	8		Lab Pack		551
potassium orthophosphate	*125*	15	Lab Pack		551
pyrophoric organometallic	6		Lab Pack		551

sodium borohydride	6		Lab Pack		551
sulphur trioxide	28		Lab Pack		551
tetramethylsilane	6		Lab Pack		551
water reactive solids	123		Lab Pack	7,251	551
organic liquids	2,699		OL	2,699	343
organic solids	1,626		OS	1,626	331
aerosols	177		Other		331
pesticides	346		Other	523	232
paint	*917*	110	Paint	917	331
total	58,063	3,983		58,063	
tons	29.03	16.61		29.03	
waste - exempt	10.50				

* For computational purposes, all liquid entries have been transformed to pounds using a standard conversion factor of 8.34 pounds/gallon.

(i) The processes, operations, and activities generating the waste(s), with corresponding block diagrams to illustrate the basis of generation.

As stated in section (g), hazardous waste is generated in the University's academic and facility operations. The hundreds of educational and research techniques cannot be described in detail. Attachments (g) 1 and (g) 5 are block diagrams illustrating the laboratory and facility processes that generate hazardous waste. The operations generating the general waste streams are described below.

Corrosive liquids:

Purchased in a pure state and used to dissolve solute, balance the PH and to keep dissolved metals in solution in reactions in teaching and research laboratories.

Corrosive solids:

Purchased in a pure state and used in reactions in teaching and research laboratories.

Organic liquids:

Purchased in a pure state and used as a solvent in reactions to synthesize compounds in teaching and research laboratories.

Organic solids:

Purchased in a pure state and used as a starting material for reactions in teaching and research laboratories.

Inorganic liquids:

Purchased in a pure state and used as a starting material for reactions in teaching and research laboratories.

Inorganic solids:

Purchased in a pure state and used as drying agents and starting material for reactions in teaching and research laboratories.

Flammable liquids:

Purchased in a pure state and used predominantly as a solvent in teaching and research laboratories.

Flammable solids:

Purchased in a pure state for use in the synthesis of compounds as a substrate for other chemicals and as a source for metal in solution.

Lab packs:

Hazardous waste (solid and liquid) generated from experiments in teaching and research laboratories, unused or outdated chemicals, material generated from small spill responses and contaminated broken glassware.

Extremely hazardous waste:

Purchased in a pure state in small amounts. Used as buffers to prevent bacterial growth, as starting materials for reactions and in thermometers, barometers and monometers for the measurement of temperature and pressure.

Paint:

Unused and/or surplus paint and paint related materials from theater productions, art projects /displays, facility maintenance and construction projects.

Other:

Miscellaneous materials, including California Universal Waste products (batteries & thermostats), aerosols and one time project/renovation/cleanup wastes.

(j,k) Evaluation of potential viable source reduction measures and consideration of evaluation factors.

Because the types of source reduction measures that are applicable to an educational institution are mostly administrative in nature, they apply to most waste streams. Therefore, evaluation of source reduction measures is performed at the process or operations level (i.e., for laboratories and facilities) rather than for individual waste streams.

Evaluations of source reduction measures are performed separately for laboratory and facility activities. Many of the measures, especially the administrative steps, are generally the same for both.

The evaluations combine the source reduction approaches and measures from Section 66523.1(j) with the evaluation factors from Section 66523.1 (k). The approaches and measures are shown vertically on the left of the matrix and the evaluation factors are shown horizontally along the top of the matrix. The letters and numbers shown in parentheses correspond to the section of the regulations in which the item is required.

Two source reduction approaches listed in Section 66523.1(j), production process change and product reformulation, are not included in the evaluation because the University does not produce a product. Therefore, these source reduction approaches are not applicable and are not evaluated. For the same reason, two evaluation factors, return on investment and effects on product quality, are not used in the evaluation.

Evaluation and Weighing Factors

Each evaluation factor is weighted with respect to its relative importance to implementing a source reduction measure at an educational institution [see Attachment (j,k) I and (j, k) 2]. The weighting factors are represented by a percentage with all of them adding up to 100 percent. Weighing factors are assigned such that the factors pertaining to environmental protection and health and safety add up to 65 percent (i.e., decrease in hazardous waste generated; employee health and safety; and releases to air, water and land). The factors pertaining to technical feasibility, institutional implement ability, permits, and cost add up to 35 percent. The rationale for assigning the weighing factors is described in the following paragraphs.

Because the goal of SB 14 is to reduce the generation of hazardous waste at its source, the evaluation factor, decrease in hazardous waste generated, is given a fairly high weight of 15 percent. Technical feasibility is given a weight of *5* percent because the evaluation assumes that all of the measures listed are technically feasible. (This detailed evaluation includes all of the potentially viable source reduction measures identified; an initial screening was not conducted pursuant to CCR Section 66523.1(o).) Technical Feasibility is used more to access how widely applicable a particular measure is throughout the campus, given the extremely diverse nature at all teaching and

research activities.

Employee health and safety is given the highest weight of 20 percent because of its importance to the university.

Four evaluation factors are given a weight at 10 percent: cost, releases to air, water and land.

Because most of the source reduction measures that are potentially applicable to a university are administrative or operational in nature, it is assumed that permits or variances may not be required for most measures. Therefore, this factor is given a fairly low weight of *5* percent.

Institutional implement ability is given a fairly high weight at 15 percent because the CSU is made up of diverse teaching, administrative and research units, all of which are a part of a large system-wide institution. Any source reduction measure must be implemented consistent with current teaching, administrative and research practices as well as institutional policies and procedures. As such, implement ability of any measure within the CSU institutional framework warrants a high weighing factor.

Relative Ranking of Source Reduction Measures

Each source reduction measure is analyzed against the evaluation factors by using a relative numerical ranking of 1, *5,* or 10. A '10' indicates a good ranking and a '1' indicates a poor ranking. For each evaluation factor, the relative ranking system is applied as follows:

> Decrease in hazardous waste generated: 10 = relatively large decrease; 5 = medium decrease, possible decrease, no effect, or different effect; 1 = minimum decrease
>
> Technical feasibility: 10 = feasible for most university academic and administrative operations; 5 = may be feasible for some operations, or not known to what extent it may be feasible (i.e., the actual applications or the extent to which the measure may be feasible to specific research applications is currently unknown); l=not widely applicable to most academic and administrative operations.
>
> Costs: 10 = high cost; 5 = medium cost; l =low cost.
>
> Employee health and safety: 10=beneficial; 5= neutral or no affect; l = detrimental.
>
> Permits, variances, schedules: 10=needs permit, etc.; 5 = possibly needs permits (depending on the substitute chemical or method used, for example); l = no permits required.
>
> Releases to air, water, land: 10 = large decrease; 5 = medium decrease, possible decrease, no effect, or different effect (depending on the substitute chemical or method used, for example) l= increased release.
>
> Institutional implement ability: l0 = fairly easy; 5 = somewhat difficult; 1 = very difficult

Evaluation Procedure

The evaluation of potential source reduction measures is performed by:

1) assigning a relative numerical ranking to the evaluation factor for each measure (first number shown on Attachments [j,k] 1 through [j, k] 3);

2) multiplying the ranking by the weighting for the evaluation factor (second number shown on the same attachments);

3) summing the products for each measure (shown in last column on the same attachments).

The total score gives a relative indication of the feasibility of implementing the source reduction measure, 10 being good and 1 being poor.

(1) Any pertinent information, such as waste stream constituents and concentration, needed to evaluate and implement source reduction measures.

Constituents of waste streams are included in section (i) of this plan. More detailed information is not used to evaluate source reduction approaches because the types of measures are primarily administrative or operational in nature, and as such, apply to most waste streams.

(m) A specification of, and rationale for, the technically feasible and economically practicable source reduction measures which will be implemented for each waste stream.

Because the source reduction measures that will be implemented are administrative or operational, the measures apply to all waste streams. Therefore, the measures that will be implemented are described for all laboratory and facility waste streams.

1. Train professors, students, and staff on hazardous waste source reduction

This measure received a high ranking of 10 for all evaluation factors except for cost, for which it received a *5;* the total score was *9* for both laboratory and facility activities. Any training program will require funds and staff resources, although we do not expect the costs to be excessive. An effective training program will educate professors, students, and staff not only in source reduction but also in hazardous waste management issues. As such, the initial result may not show an apparent decrease in waste generation because, in general, as people learn more about what is a hazardous waste and how hazardous waste should be properly managed, more hazardous waste may be collected, but it may not represent an actual increase in generation.

A training program for professors, students, and staff will be implemented to educate them in the regulatory requirements for hazardous waste source reduction as well as the benefits. Many of the measures listed and evaluated in Section (j,k) that did not receive a high score and will not be implemented as a separate item, may be included as part of the training program. These include:

- Substitute chemicals with less hazardous chemicals
- Eliminate oil-based paint
- Use less hazardous cleaners
- Eliminate use of lead-based glaze
- Use water-based cutting fluids
- Replace solvent degreasers
- Reduce volume used in experiments
- Pre-weighing chemicals for undergraduate use
- Reduce volume/toxicity of chemicals as final step in experiments
- Reuse spent solvent for initial rinse, fresh solvent only for final rinse
- Label all used chemicals and wastes
- Order exact amounts of chemicals or supplies to be used
- Rotate chemical stocks (first-in-first-out)
- Promote sharing among common users
- Surplus chemical exchange

2. Develop campus source reduction policy, and

3. Upper management commitment to source reduction

These two measures received a high ranking of 10 for all evaluation factors except for institutional implement ability, for which they received a *5;* the total score was *9.5* for both laboratory and facility activities. In general, campuses are organized into Academic Departments and Administrative Departments. The Environmental Health & Instructional Safety (EH&IS) Office is an Administrative unit. The EH&IS office has primary responsibility for managing hazardous waste campus-wide. Although EH&IS would establish source reduction measures, most of the implementation of any measure would happen within Academic units. Therefore, any policy must have the commitment of both the Academic and Administrative Vice Presidents. This will require education and training at the upper management level.

4. Information Exchange

This measure also received a high ranking of 10 for all evaluation factors except two; it was given a *5* for cost and for institutional implement ability because any information exchange program will require funding and resources and it will need to cross organizational boundaries. The total score for this measure was *8.75*. As with the training program, many of the source reduction measures not selected for implementation as a separate item may be included in the information exchange program. These include:

- Substitute specialty detergents for chromic/sulfuric acid (chromerge) solution
- Substitute chemicals with less hazardous chemicals
- Reduce volume used in experiments
- Pre-weighing chemicals for undergraduate use
- Reduce volume/toxicity of chemicals as final step in experiments
- Reuse spent solvent for initial rinse, fresh solvent only for final rinse
- Promote sharing among common users
- Surplus chemical exchange

5. Inventory of chemicals

Although this measure received a medium total score of *6.25,* it has already been implemented as part of the requirements of CCR Section 25500 et sea. The inventory will be updated annually as required by existing law.

6. Locate surplus and unused chemicals

This measure received a fairly high total score of *7.5* primarily because a significant portion of the University's existing waste stream consists of unused and surplus chemicals. Locating and redistributing or disposing of them as soon as possible is desirable. Because of potential initial chemical "clean-outs" in University labs, however, there may be an initial increase in hazardous waste generation.

(n) An evaluation, and to the extent practicable, a quantification, of the effects of the chosen source reduction measure on emissions and discharges to air, water, and land.

Effects of the chosen source reduction measures can not be quantified. Qualitative effects are included in the evaluation as part of section j, k of this plan and attachments (I, k) 1 through (j, k) 3.

(o) A list of each measure considered but not selected for detailed evaluation and the rationale for rejecting the measure.

No source reduction measures were rejected before undergoing a detailed evaluation. All measures identified were assumed to be technically feasible. See Section j, k for the detailed evaluation.

(p) Timetable for implementing source reduction measures.

Because the administrative measures that will be implemented apply to all waste streams, one timetable is prepared for implementing the measures campus-wide (i.e., for laboratories and facilities). The timetable for implementing source reduction measures is shown in Attachment (p) 1. Two measures will undergo further research to determine whether they are viable for implementation: 1) checking if unused chemicals can be returned to the venders; and 2) receiving partial shipments of chemicals from venders. The schedule for researching these source reduction measures is shown in Attachment (1) 2.

Part 2

SUMMARY OF SOURCE REDUCTION EVALUATION REVIEW AND PLAN
California Code of Regulations Section 66523.2

This Summary of the Source Reduction Evaluation Review and Plan (Plan Summary) has been prepared by California State University at Fullerton in accordance with California Code of Regulations (CCR) Section 66520et The numbered and lettered Sections of this Plan Summary correspond to the numbers and letters contained in CCR Section 66523.2. Certification of the Plan Summary pursuant to Section 66525 is contained in Part *5*.

(a) **Campus name:** California State University, Fullerton

Mailing address: California State University, Fullerton
Fullerton, CA 92634

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CA ID No: HAHQ 36-008384

SIC code: 8221: Educational Services -- Colleges and Universities

(b) Brief overview of review and plan

California State University, Fullerton is an educational institution and does not manufacture a product. Hazardous waste is generated by its academic and facilities operations. CSUF has over 150 educational laboratories, studios and shops using numerous research and educational techniques in each laboratory. As such, each technique can not be described in detail.

Hazardous waste generated by laboratories and facilities on campus is accumulated at a 90 day storage facility. The waste is characterized and compatible waste is bulked into waste streams, each of which may include several California Waste Codes. The actual point of generation of individual California Waste Codes can not always be provided. Therefore, the general types of waste streams and quantities are provided and the source reduction Review and Plan is based on these waste streams.

The Review and Plan identifies the waste streams that exceed five percent of the total hazardous waste stream and total extremely hazardous wastes. However, because source reduction measures that are potentially viable for an educational institution are primarily administrative or operational in nature, the measures apply to most waste streams rather than individual waste streams. Therefore, the evaluation and the description of the measures are not based on waste stream but on campus operations, i.e., laboratories and facilities.

(c) A summary of the information used for evaluation of each source reduction approach, required by CCR Section 66523.1(k).

As mentioned in section (b) of this Plan Summary, there are thousands of teaching and research techniques employed at the University which can not be described in detail. The types of source reduction measures that are potentially viable for an educational institution are primarily administrative or operational in nature. Detailed chemical inventories do not provide useful information for evaluating these types of measures. Therefore, evaluating source reduction approaches requires a basic understanding of the University's administrative and hazardous waste management operations as well as its institutional organization and policies. The approaches required by CCR Section 66523.1(k) were evaluated except for production process changes and product reformulation; because the University does not produce a product. The factors used to evaluate individual measures included those required by CCR Section 66523.1(k) except for two: return on investment and effects on product quality. One additional factor, institutional implement ability, was an important factor in the evaluation.

(d) A summary of the information required by CCR Section 66523.1(m).

Because the source reduction measures that will be implemented are administrative or operational, the measures apply to most waste streams. Therefore, the measures described here will be implemented for both laboratory and facility operations.

1. Train professors, students, and staff on hazardous waste source reduction.

Any training program will require funds and staff resources, although we do not expect the costs to be excessive. An effective training program will educate professors, students, and staff not only in source reduction but also in hazardous waste management issues. As such, the initial result may not show an apparent decrease in waste generation because, in general, as people learn more about what is a hazardous waste and how hazardous waste should be properly managed, more hazardous waste may be collected, but it may not represent an actual increase in generation.

A training program for professors, students, and staff has been implemented to educate them in the regulatory requirements for hazardous waste source reduction as well as the benefits. Many of the measures listed and evaluated in Section (j, k) that did not receive a high score and will not be implemented as a separate item, may be included as part of the training program. These include:

- Substitute chemicals with less hazardous chemicals
- Eliminate oil-based paint
- Use less hazardous cleaners
- Eliminate use of lead-based glaze
- Use water-based cutting fluids
- Replace solvent degreasers
- Reduce volume used in experiments
- Pre-weighing chemicals fur undergraduate use
- Reduce volume/toxicity of chemicals as final step in experiments
- Reuse spent solvent for initial rinse, fresh solvent only for final rinse
- Label all used chemicals and wastes
- Order exact amounts of chemicals or supplies to be used
- Rotate chemical stocks (first-in-first-out)
- Promote sharing among common users
- Surplus chemical exchange

2. Develop campus source reduction policy, and

3. Upper management commitment to source reduction

As previously mentioned in Section (j, k) of the plan, campuses are organized into Academic departments and Administrative units. The EH&IS Office, an Administrative unit, has primary responsibility for managing hazardous waste campus-wide. Although EH&IS would establish and coordinate source reduction measures, most of the implementation of any measure would happen within Academic units. Therefore, any policy must have the commitment of both the Academic and Administrative Vice Presidents. This will require education and training at the upper management level.

4. Information exchange

As with the program, many of the source reduction measures not selected for implementation as a separate item may be included in the information exchange program. These include:

- Substitute chemicals with less hazardous chemicals
- Reduce volume used in experiments
- Pre-weighing chemicals for undergraduate use
- Reduce volume/toxicity of chemicals as final step in experiments
- Reuse spent solvent for initial rinse, fresh solvent only for final rinse
- Promote sharing among common users
- Surplus chemical exchange

5. Inventory of chemicals

The inventory process has been implemented as part of the requirements of CCR Section 25500 *et seq* (Business Plan law). The inventory is updated annually as required by existing law.

6. Locate surplus and unused chemicals

Locating and redistributing or disposing of surplus or unused chemicals as soon as possible is desirable. Because of potential one-time chemical "clean-outs" in University labs, however, there may be an increase in hazardous waste generation.

(e) A summary of the information required by CCR Section 66523.1(o) for each rejected measure.

No source reduction measures were rejected before undergoing a detailed evaluation. See section (j,k) in Part 1 for the detailed evaluation.

(f) A brief abstract for each source reduction measure to be implemented or those which have been implemented in the proceeding year. Include the following components:

(1) Quantity of waste – 1998 and 2002:

	1998	2002
total extremely hazardous	278	620
lab pack	7,680	7,251
corrosive liquids	1,237	346
corrosive solids	12	48
flammable liquids	2,517	4,593
flammable solids	10	343
inorganic liquid	410	1,265
inorganic solids	60	771
organic liquids	313	2,699
organic solids	1,635	1,626
other	840	523
paint	3,545	917
total	18,537	21,002

(2) Process or activity generating the waste:

The processes for generation of hazardous waste on the campus remain the same. Wastes are produced as a result of laboratory scale teaching and research experimentation and facilities maintenance activities. No products are produced.

(3) Source reduction approach:

Source reduction approaches on the campus remain the same. Any new technique or method is evaluated on the basis of the following criteria:

a. reduction of the quantity of waste (both hazardous and non-hazardous).
b. reduction in the type of the waste (replacing extremely hazardous waste with less toxic materials) .
c. cost savings.

(4) Brief description of source reduction measures:

The following measures have proved worthwhile in the reduction of the hazardous waste generated on campus:

Substitute chemicals with less hazardous chemicals
Reduce volume used in experiments
Pre-weighing chemicals for undergraduate use
Reduce volume/toxicity of chemicals as final step in experiments

Reuse spent solvent for initial rinse, fresh solvent only for final rinse
Promote sharing among common users

(5) Brief economic overview, including capital and operating and maintenance costs:

The overall cost of hazardous waste generated from the teaching and research laboratories and the waste from standard facility maintenance has remained constant over the last four years. Costs due to special projects, spill response and demolition have been excluded from this analysis.

(6) Barriers/obstacles including any state, federal or local government requirements:

The shipment/destruction of mercury compounds played a roll in the increase of this waste stream from the 1998 – 2002 reporting years. Federal restrictions prohibited the disposal of these compounds until waste facilities were permitted. These compounds remained on campus until they could be shipped between 1998 and 2002.

Lack of funds due to a reduction in the overall budget, prevented the initiation of the mercury thermometer elimination program during this reporting period.

(7) Identification of discharge impacts to air, water, and/or land, if any:

No impacts to air, water and/or land were identified during this reporting period.

Part 3

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT
California Code of Regulations Section 66524

This Hazardous Waste Management Performance Report (Report) has been prepared by the California State University, Fullerton in accordance with California Code of Regulations (CCR) Section 66520 *et seq*. The numbered and lettered sections of this Report correspond to the numbers and letters contained in CCR Section 66524.1 (a). For this Report, 1998 is the baseline year and 2002 is the current year. Certification of this Report is contained in Part *5*.

(1) Campus name: California State University, Fullerton

Mailing address: California State University, Fullerton
800 N State College Blvd.
Fullerton, CA 92634

Campus address: California State University, Fullerton
800 North State College Blvd.
Fullerton, CA 92634

(2) SIC code: 8221: Educational Services--Colleges and Universities

(3) The following information, for each waste stream identified, is pursuant to Section 66523.1 (h)

(A) Quantitative Analysis of waste streams generated

Hazardous Waste

				pounds per student		
	1998	2002	% change	1998	2002	CA waste codes
# students	24,522	32,143	31			
lab pack	7,680	7,251	-6	0.3132	0.2256	551
corrosive liquids	1,237	346	-72	0.0504	0.0108	791,121
corrosive solids	12	48	300	0.0005	0.0015	181
flammable liquids	2,517	4,593	82	0.1026	0.1429	212
flammable solids	10	343	3,330	0.0004	0.0107	352
inorganic liquid	410	1,265	209	0.0167	0.0394	134
inorganic solids	60	771	1,185	0.0024	0.0240	141
organic liquids	313	2,699	762	0.0128	0.0840	343
organic solids	1,635	1,626	-1	0.0667	0.0506	331
other	840	523	-38	0.0343	0.0163	331,232,272
paint	3,545	917	-74	0.1446	0.0285	331

Extremely Hazardous Waste

				pounds per student		
	1998	2002	% change	1998	2002	CA waste codes
# students	24,522	32,143	31			
mercury	10	228	2,180	0.0004	0.0071	725
mercury compounds	209	127	-39	0.0085	0.0040	181
arsenic compounds	10	43	330	0.0004	0.0013	721
bromine	23	16	-30	0.0009	0.0005	791
cyanides	11	19	73	0.0004	0.0006	711
other EH compounds	15	187	1,147	0.0006	0.0058	271,141
total EH	278	620	123	0.0113	0.0193	all the above

(B) A description of current hazardous waste management approaches and identification of all approaches implemented since baseline year.

Corrosive liquids:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Wherever feasible substitute a less hazardous material.

Corrosive solids:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

Organic liquids:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

Organic solids:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

Inorganic liquids:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

Inorganic solids:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

Flammable liquids:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

Flammable solids:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

Lab packs:

Lab Packs are the convenient method to dispose of the majority of the miscellaneous chemicals generated in the teaching, research laboratories, studios and shops. Efforts to minimize individual waste streams are coordinated in consultation with our hazardous waste contractor and user departments.

Extremely hazardous waste:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

Paint:

Paint usage is considered for specific project use to minimize the amount purchased to ultimately reduce the waste generated. Facility repainting is now scheduled on a longer sequence to reduce the paint used.

Other:

Current practice is to implement micro-scale processes whenever possible to reduce the quantity of generated hazardous waste. Use the smallest amount possible. Wherever feasible substitute a less hazardous material.

(C) An assessment of the effect, since the baseline year, of implemented hazardous waste management practices including percent change in weight of hazardous waste generated, the properties which cause it to be classified as a hazardous waste, and/or the on-site and off-site management of hazardous waste. The report shall consider source reduction, on-site and off-site recycling, and on-site and off-site treatment.

We believe our hazardous waste reduction measures and practices from the 1998 baseline year have been successful. However, to assess the effect of those implemented measures and practices, the following decisive factors must be addressed since several campus waste streams produced during this reporting period have increased:

1. A 31% increase in student population (24,522 in 1998 to 32,143 in 2002) necessitated an increase in the number of classes which has therefore caused an increase in the total amount of hazardous waste generated during this reporting period. However while the total pounds of generated hazardous waste increased (18,537 in 1998 to 21,002 in 2002) the result was an increase of only 13%. If the pounds of waste generated per student are calculated (0.76 in 1998 to 0.65 in 2002) we actually achieved a decrease in the amount of hazardous waste generated. Therefore the overall program accomplished positive results.

2. During this reporting period many faculty retired. Those who did research left many chemicals in their laboratories which had to be properly disposed of. While many of these chemicals were either returned to the stockroom or redistributed to other researchers, a number of chemicals including extremely hazardous materials were deemed non usable and were disposed of.

3. During this reporting period, we also completed two major cleanup activities in the chemical stockroom. The first eliminated many unused and unwanted surplus bulk chemicals that were being stored in larger quantities. The second disposed of many extremely hazardous materials in our attempt to favor less toxic alternatives in research and teaching experimentation. Both of these events increased the total amounts generated in several waste steams.

4. Elemental mercury was eliminated wherever possible. This waste stream increased dramatically during this reporting period (10 lbs in 1998 to 228 lbs in 2002). This is a 2,180 % increase; however, this was an anticipated gain. Monometers, barometers and some thermometers were replaced with electronic versions eliminating the need for mercury.

5. Budgetary constraints have slowed and will continue to affect our progress with several of the planned programs. The mercury thermometer replacement program, for example, was postponed last year due to the lack of funds. The outlook for the next two fiscal years looks similar if not worse than last year.

Productive efforts will continue during the next reporting period (2002 to 2006) in spite of possible fiscal constraints. The campus hazardous waste program will have continued management support due to regulatory compliance requirements.

(D) A description of factors during the current reporting year that have affected hazardous waste generation and on-site and off-site hazardous waste management since the baseline year, including, but not limited to, the following:

1. Changes in business activities (in academic setting):

   The campus has experienced a 31% increase in student enrollment during this reporting period. This enrolment change necessitated an increase in the number of classes and an increase in research activities.

2. Changes in waste classification:

   There have been no changes in waste classification in this reporting period.

3. Natural phenomena:

   There have been no natural phenomena that would affect the plan during this reporting period.

4. Other factors:

   The State of California has added a new waste category, Universal Waste. This new category has moved several small waste streams, mercury batteries and thermostats, into an easier disposal venue which has helped to reduce the amount of extremely hazardous waste produced by the campus. No other factors have affected our hazardous waste generation in this reporting period.

Part 4

SUMMARY OF HAZARDOUS WASTE MANAGEMENT PROGRESS REPORT
California Code of Regulations Section 66524

This Summary Progress Report (SPR) has been prepared by the California State University, Fullerton in accordance with California Code of Regulations (CCR) Section *66520* et seq. The numbered and lettered Sections of this Report Summary correspond to the numbers and letters contained in CCR Section *66524.2*. For this Report, 1998 is the baseline year and 2002 is the current year. Certification of this Summary Progress Report is contained in Part *5*.

See attachments (q1) and (q2) for the Summary Progress Report, Table 1: General Information and Table 2: Specific Waste Stream Information.

Part 5

CERTIFICATION
California Code of Regulations Section 66525

a) Certification by a registered professional engineer, a registered environmental assessor, or an individual who is responsible for the processes and operations of the site. Certification that the review and plan and plan summary meet the following requirements:

1) The review and plan addresses each hazardous waste stream identified pursuant to CCR Section 66523.1(h).

2) The review and plan addresses the source reduction approaches specified in CCR Section 66523.1 (j).

3) The review and plan clearly sets forth the measures to be taken with respect to each hazardous waste stream for which source reduction has been found to be technically feasible and economically practicable, with timetables for making reasonable and measurable progress, and properly documents the rationale for rejecting available source reduction measures.

4) The plan summary meets the requirements of CCR Section 66523.2.

5) The review and plan and plan summary does not merely shift hazardous waste from one environmental medium to another environmental medium by increasing emissions or discharges to air, water, or land.

b) Certification by a registered professional engineer, a registered environmental assessor, or an individual who is responsible for the processes and operations of the site. Certification that the report and report summary meet the following requirements:

1) The report identifies factors that affect the generation and onsite and off-site management of hazardous wastes and summarizes the effect of those factors on the generation and on-site and off-site management of hazardous wastes.

2) The report summary complies with the requirements specified in CCR Section 66524.2.

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Robert M. Gill Date
Certified Hazardous Materials Manager

c) The plan, plan summary, report and report summary shall be signed and dated by a person who is capable of committing financial resources necessary to implement the plan; either the owner, the operator, a responsible corporate officer, or an authorized individual.

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for making false statements or representations to the Department, including the possibility of fines for criminal violations.

_____ _____

Bill Barrett Date

Associate Vice President for Administration