

NOTE: This study is presented as an example, and it does not include all referenced attachments.

Unit 10 Chemist Classification Study
March 2003

SUMMARY

The attached report represents the results of the classification study of Unit 10 Chemist Classifications conducted by representatives of Department of Personnel Administration (DPA) and California Association of Professional Scientists (CAPS) as a joint union/management team in accordance with Section 17.3 of the Unit 10 2001/2003 contract. The purpose of the study was to determine the feasibility of consolidating four groups of represented chemist classifications into a generalized chemist classification series. The information for the study was collected from job descriptions, class specifications, represented and excluded subject matter experts, and departmental human resources professionals.

The results of the classification analysis indicated the overall scope of work, typical tasks, and minimum qualifications could be described in one generalized chemist classification series. It is recommended that the following represented classes be consolidated into a single series Chemist Classification Series: Agricultural Chemists, Junior Chemist, Petroleum Products Chemists, Public Health Chemists, and Textile Chemists. (See Attachment G)

A separate review of the related excluded (supervisory) chemist classes indicate consolidation is also warranted. The information for this review was collected from job descriptions, organization charts, class specifications, excluded subject matter experts, and departmental human resources professionals.

Report prepared by:

Debra Thompsen, Staff Personnel Program Analyst
Kathy Darling, Staff Personnel Program Analyst

INTRODUCTION

PURPOSE OF THE STUDY

The classification study of Unit 10 Chemist Classifications was conducted by representatives of Department of Personnel Administration (DPA) and California Association of Professional Scientists (CAPS) as a joint union/management team to comply with Section 17.3 of the Unit 10 2001/2003 contract. The joint union/management team members are attached (Attachment A).

In addition to the classes identified in the contract language, the joint union/management team agreed to add the Junior Chemist class to the study. The specifications for each classification are attached (Attachment B).

The contract language mandating this study (Subsection A) and related contract language (Subsection C) is described as follows:

(Subsection A)

A. Clinical Chemistry Classes

CAPS and the State agree to form a joint labor-management committee to perform a classification study on the Agricultural Chemist (Range A/B), II, and III (Specialist), Public Health Chemist I, II, and III (Specialist), Petroleum Products Chemist I and II, and Textile Chemist I and II classes. The committee shall review and compare the scope of work, typical tasks, minimum qualification requirements, including knowledge and abilities, for the purpose of making recommendations to the classification structure.

The committee shall be staffed with an equal number of labor and management representatives, not to exceed a total of six members and a Chairperson. The Chairperson will be a representative of the Classification and Compensation Division (CCD), Department of Personnel Administration (DPA). The Chairperson will provide guidance on the method of data collection and analysis. The committee will attempt to come to mutual agreement on determining data collection methods, and resolve issues. The chair of the committee shall only vote to break a tie.

The study shall begin no later than February 1, 2002. The committee will issue a report no later than January 31, 2003, or if extended, a mutually agreed upon date between CAPS and DPA. At a minimum, the report will contain a summary of data collected and method used, classification considerations analysis and recommendation. If there is a cost associated with this study, it shall be subject to the availability of funds.

If the State and CAPS do not come to mutual agreement on the issuance of a report and recommendation, the State and CAPS agree to meet and confer on the results of the study.

(Subsection C)

- C. At the conclusion of a study identified in Section 17.3, if a classification change proposal is initiated by the State, the process will be in accordance with Section 17.1, Classification Changes. However, CAPS will waive the notice requirements and sign a statement of support for the classification change proposal.

WORK PLAN SUMMARY

May 2002 – Joint union/management team established; preliminary data/material distributed (Mutual agreement regarding delay of start of study from February 2002 to May 2002).

May/June 2002 – Data collection in progress.

July/September 2002 – Determine and develop methodology/tools to analyze data; analyze data.

September 2002 – Tour of Department of Food and Agriculture Laboratory and observations of Chemists/environment.

October/November 2002 – Preliminary findings and draft specification provided to departmental management; feedback from departmental management.

January 2003 – Preliminary report of findings and recommendation; resolve salary considerations.

March 2003 – Final report of findings and recommendations (per contract due 1/31/03 or mutually agreed upon date).

April 2003 – Prepare and submit Board Item.

SCOPE AND RESEARCH METHODOLOGY

DEMOGRAPHICS

As of May 2002, the departments using the chemist classes identified in this study and the numbers of filled chemist positions are listed as follows:

Department of Food and Agriculture (CDFA)	49
Department of Health Services (DHS)	68
Department of Toxic Substances Control (DTSC)	34
Department of Fish and Game (DFG)	8
Department of Water Resources (DWR)	7
State Water Resources Control Board (SWRCB)	1
Department of Consumer Affairs (DCA)	3
Air Resources Board (ARB)	1
TOTAL	171

As of May 2002, the filled positions for each classification are as follows:

Junior Chemist	0
TOTAL	0
Agricultural Chemist (Range A/B)	7
Agricultural Chemist II	33
Agricultural Chemist III (Specialist)	11
TOTAL	51
Public Health Chemist I	10
Public Health Chemist II	69
Public Health Chemist III (Specialist)	32
TOTAL	111
Petroleum Products Chemist I	4
Petroleum Products Chemist II	2
TOTAL	6
Textile Chemist I	0
Textile Chemist II	3
TOTAL	3

As of January 2003, the Personnel Information Exchange (PIE) database which utilizes information from the State Controllers reflects a similar number of filled positions. Overall there are 16 fewer filled positions (155 versus 171).

STUDY DESIGN

The research methodology utilized for this study, determined and agreed to by the joint union/management team including representatives from CDFR, DHS, and DTSC, consisted of the following elements:

- A. Preparation of a generalized Chemist Series Specification by subject matter experts (Chemists) on joint union/management team (Attachment C).
 1. Specification was patterned, in part, after the Agricultural Chemist series.
 2. Deep class structure/alternate range criteria created.
 3. Draft Chemist specification was used as a comparison tool in the study to validate or invalidate common traits among existing chemist classes in study.
- B. Preparation of Work sheets regarding Scope, Typical Tasks, Minimum Qualifications, including Knowledge and Abilities, and Duty Statements.

1. Work sheets based on the draft generalized Chemist series and used as a comparison tool between existing chemist specifications and duty statements collected.
 2. Tasks performed, but not listed in specifications, were identified and evaluated.
- C. Data collection included duty statements representing existing chemist positions from all user departments (CDFA, DHS, DTSC, DFG, DWR, SWRCB, DCA, and ARB) and existing four groups of Chemist Classifications identified in study.
- The data collected was analyzed to determine the distinctions in the scope of work, tasks performed, minimum qualifications, and to determine differences in the tasks from those in the generalized Chemist series.
- D. Departmental Comments on Proposed Chemist Specification.
- Survey of eight user departments using the existing chemist classes. The survey was a series of questions requiring departmental feedback on management's assessment of proposed Chemist specification accuracy and adequacy; selection issues; movement of incumbents in the chemist classes for assessment of deep class feasibility; and educational requirements (Attachment D).

CLASSIFICATION CONSIDERATIONS

PREFACE

As indicated in the introduction, the parameters of the Chemist study required the joint union/management team to review and compare the scope of work, typical tasks, minimum qualification requirements, including knowledge and abilities, for the purpose of making recommendations to the classification structure. The focus of the study was to determine whether or not it was feasible to consolidate the four groups of chemists into a generalized class description of chemist. In addition, the feasibility of creating a deep class alternate range from the entry to journey level was also explored.

In the civil service classification system, all positions shall be included in the same class if the following apply:

- A. The positions are sufficiently similar in respect to duties and responsibilities that the same descriptive title may be used.
- B. Substantially the same requirements as to education, experience, knowledge, and ability are demanded of incumbents.
- C. Substantially the same tests of fitness may be used in choosing qualified appointees.
- D. The same schedule of compensation can be made to apply with equity.

Alternate ranges are designed to recognize increased competence to perform the duties of a class based upon experience in the class. In order for a class to technically be established as a "deep class," a single test of fitness can be used for all levels in the deep class and promotion to the highest level in the deep class is virtually automatic.

CLASSIFICATION ANALYSIS

Class Concepts:

Proposed Chemist Series

This series consists of three classes used to perform a broad range of staff and supervisory chemistry work concerning agricultural, environmental, natural resources, or consumer protection, and environmental or public health. Incumbents perform or supervise chemical analyses to identify the concentration of substances that may be constituents, adulterants, contaminants, or potentially hazardous chemicals in the environment, food, consumer products, biological tissues and fluids, hazardous waste, or industrial and agricultural commodities.

Existing Classes:

Junior Chemist

In a learner capacity, the Junior Chemist makes physical and chemical analyses to determine the identity and concentration of substances that may be constituents, adulterants, contaminants, or potentially hazardous chemicals.

Textile Chemist I and II

These classes perform varied chemical, flammability testing and research, and other physical testing work involved in making qualitative and quantitative analyses of textile and other materials used in home furnishings products and components.

Petroleum Products Chemist Series

This series consists of three classes used to perform or supervise varied analytical determinations in connection with the quantitative and qualitative analyses of petroleum and automotive products such as gasoline, diesel fuel, motor oil, automatic transmission fluid, kerosene, fuel oil, brake fluid, engine coolants, and two-cycle engine fuel.

Agricultural Chemist Series

This series consists of four classes used to perform and supervise varied analytical determinations in connection with the quantitative and qualitative analysis of agricultural products and chemicals. Incumbents perform or supervise chemical analyses to determine the identity and concentration of substances that may be constituents, adulterants, contaminants, or potentially hazardous chemicals in economic poisons, fertilizing materials, spray residue, commercial feeds, livestock remedies, water pollutants, meat products, dairy products, fish and wildlife, or related products.

Public Health Chemist Series

This series consists of four classes used to perform and supervise the chemical laboratory work in the Laboratory Services Program of the Department of Health Services. The series is appropriate for use in other departments with laboratories conducting public health work. Work assignments are varied and may require both field and laboratory work in the department's various programs such as Food and Drug, Sanitation and Radiation, Air and Industrial Hygiene, Clinical Chemistry, and Hazardous Materials.

Conclusion:

All of the identified chemist classes/series are involved in performing or supervising physical and chemical analyses to make determinations on substances that impact the particular field of study under the responsibility of each department. Although the substances analyzed and the field of study may be unique to each participating department, the general methods, procedures, and tests involved are similar and practiced by all chemists. Therefore, the class concepts are similar for all classes identified in this study.

COMPARISON OF PROPOSED CHEMIST SPECIFICATION WITH CURRENT SPECIFICATIONS

Scope of Work:

Entry Level

Proposed Chemist, Range A

This is the entry and first working level of the class. Under close supervision, incumbents perform a variety of the less difficult and responsible professional chemistry work within a laboratory, office, or field setting. Following detailed instructions and specific procedures, incumbents perform chemical, physical, or biological analyses; prepare standard and reagent solutions and samples for analysis; conduct less difficult surveys, investigations, inspections and studies; draft preliminary reports; and routine correspondence; perform basic maintenance of equipment and laboratory instrumentation; answer questions from the public of a routine nature; perform quality control and assurance checks; serve as a technical witness and do other related work. Work at this level is characterized by a reliance on detailed instructions and assistance from lead persons and supervisors in the application of proven techniques and methodologies to assigned work.

Existing Class Comparisons

The Junior Chemist and the Agricultural Chemist, Range A, classes were the levels used to compare to the proposed Chemist, Range A.

The Junior Chemist classification compared to the proposed Chemist, Range A, in many of the assigned tasks and supervision received. There were a few tasks that were not identified in the Junior Chemist specification. The tasks are: preparing standard and reagent solutions; conduct less difficult surveys, investigations, and studies; perform

basic maintenance of equipment and laboratory instrumentation; and answer questions from the public of a routine nature.

The Agricultural Chemist, Range A, classification compared in much the same way as the Junior Chemist to the proposed Chemist, Range A. The tasks not identified in this class include: preparing standard and reagent solutions; conduct less difficult surveys, investigations, and studies; and answer questions from the public of a routine nature.

Intermediate Level

Proposed Chemist, Range B

Range B is the intermediate working level of the class. Under general supervision, incumbents perform a variety of responsible professional chemistry work of average difficulty within a laboratory, office, or field setting. Incumbents perform chemical, physical, or biological analyses, research, surveys, investigations, inspections and studies of average difficulty; prepare standard and reagent solutions and samples for analysis; maintain equipment and laboratory instrumentation; troubleshoot equipment problems; write preliminary reports and routine correspondence; answer questions from the public of a routine nature; prepare regulatory and compliance documents; perform quality control and assurance checks; serve as a technical witness and do other related work. Work at this level is characterized by a reliance on proven techniques and methodologies.

Existing Class Comparisons

The Agricultural Chemist, Range, B; Public Health Chemist I; Textile Chemist I; and the Petroleum Products Chemist I classifications were used as the comparable level to the proposed Chemist, Range B.

The Agricultural Chemist Range B classification included most of the identified tasks in the proposed Chemist, Range B, with the exception of a few tasks not listed in the specification. The tasks include: preparing standard and reagent solutions; performing chemical, physical or biological surveys, investigations or studies of average difficulty; answer questions from the public of a routine nature; and prepare regulatory and compliance documents.

The Public Health Chemist I classification included a portion of the identified tasks for the proposed Chemist, Range B; however, there were a greater number of specific tasks not listed in the Public Health Chemist I specification. The tasks include: performing chemical, physical or biological research of average difficulty; performing chemical, physical or biological surveys, investigations or studies of average difficulty; maintain equipment and laboratory instrumentation; troubleshoot equipment problems; answer questions from the public of a routine nature; and prepare regulatory and compliance documents.

The Textile Chemist I classification included a portion of the identified tasks for the proposed Chemist, Range B. The tasks which were not identified in the Textile Chemist I specification include: prepare standard and reagent solutions; prepare samples for analysis; perform chemical, physical or biological surveys, investigations or studies of average difficulty; maintain equipment and laboratory instrumentation;

troubleshoot equipment problems; answer questions from the public of a routine nature; and prepare regulatory and compliance documents.

The Petroleum Products Chemist I included a portion of the identified tasks for the proposed Chemist, Range B. The tasks not listed in the Petroleum Products Chemist I specification include: preparing standard and reagent solutions; prepare samples for analysis; perform chemical, physical, or biological surveys, investigations or studies of average difficulty; write preliminary reports and routine correspondence; troubleshoot equipment problems; and answer questions from the public of a routine nature.

Full Journey

Proposed Chemist, Range C

Range C is the full-journey level. Under direction, incumbents perform a variety of responsible professional and complex chemistry work within a laboratory, office, or field setting. Incumbents independently perform complex chemical, physical, or biological analyses, research, surveys, investigations, inspections, and studies; prepare standard and reagent solutions and samples for analysis; write final reports; prepare regulatory and compliance documents; operate and maintain equipment and laboratory instrumentation including the more complex laboratory equipment; prepare nonroutine correspondence; answer routine or difficult questions from the public; perform quality control and assurance checks; serve as a technical witness and do other related work. Incumbents allocated to this level perform a variety of tasks, including the more responsible, varied, and complex assignments; consult and advise public and private entities. Incumbents at this level often independently develop and implement new and advanced techniques and methodologies. Incumbents may be assigned lead responsibility for a specific project or assignment.

Existing Class Comparisons

The Agricultural Chemist II, Public Health Chemist II, Textile Chemist II, and Petroleum Products Chemist II classes were the levels used to serve as comparisons with the proposed Chemist, Range C.

The Agricultural Chemist II is comparable with the proposed Chemist, Range C, in a portion of the identified tasks. Those tasks not identified in the Agricultural Chemist II specification include: prepare standard and reagent solutions; perform complex chemical, physical or biological surveys, investigations or studies; prepare nonroutine or difficult questions from the public; and prepare regulatory and compliance documents; and consult and advise public and private entities. Agricultural Chemists may serve as expert technical witnesses.

The Public Health Chemist II is comparable with the proposed Chemist, Range C, in a portion of the identified tasks. Those tasks not identified in the Public Health Chemist II specification include: perform complex chemical, physical or biological research; prepare standard and reagent solutions; prepare samples for analysis; perform complex chemical, physical or biological surveys, investigations or studies; write final reports; prepare nonroutine correspondence; answer routine or difficult questions from the public; and prepare regulatory and compliance documents.

The Textile Chemist II is comparable with the proposed Chemist, Range C, in a portion of the identified tasks. The Textile Chemist II performs a variety of the most complex, responsible professional scientific, laboratory, office and field work. Those tasks not identified in the Textile Chemist II specification include: perform complex chemical, physical or biological analysis or research; prepare standard and reagent solutions; prepare samples for analysis; perform complex chemical, physical or biological surveys, investigations or studies; and answer routine or difficult questions from the public.

The Petroleum Products Chemist II is comparable with the proposed Chemist, Range C, in a portion of the identified tasks. The tasks not identified in the Petroleum Products Chemist II specification include: perform complex chemical, physical or biological research; prepare standard and reagent solutions; prepare samples for analysis; perform complex chemical, physical or biological surveys, investigations or studies; write final reports; prepare nonroutine correspondence; answer routine or difficult questions from the public; and consult and advise public and private entities. They may serve as expert technical witnesses.

Staff Specialist Level

Proposed Staff Chemist

The Staff Chemist is the specialist level of the series requiring scientific expertise above the full journey level. Incumbents independently identify problems, develop courses of action, and conduct the most complex and innovative chemistry work, including investigations, inspections and studies on issues of major importance to the employer, and do other related work. Incumbents operate and maintain the most complex equipment and laboratory instrumentations; plan and conduct research; originate and evaluate experimental methods; and make interpretive analyses of data. Incumbents prepare reports and papers for internal use and external publication; represents the department at public meetings and conferences; and serve as an expert witness as necessary. Incumbents may be assigned lead responsibility for a specific project, program, function, or area of expertise.

Existing Class Comparisons

The Agricultural Chemist III (Specialist) and the Public Health Chemist III (Specialist) classes were compared to the proposed Staff Chemist.

The Agricultural Chemist III (Specialist) is comparable to the proposed Staff Chemist in most assigned tasks with few exceptions. Although the Agricultural Chemist III specification does not state the incumbents perform the most complex and innovative chemical, physical or biological scientific investigations and studies of major importance to the employer, it is implied. The Agricultural Chemist III does not specifically state responsibility for representing the department at public meetings and conferences. The identified tasks do not state that the Agricultural Chemist III has lead responsibility for a specific project, program, function or area of expertise. This role is identified in the knowledges, skills and abilities as the ability to plan, direct, and do research and development.

The Public Health Chemist III is also comparable to the proposed Staff Chemist in most assigned tasks. The tasks not identified in the Public Health Chemist III specification

include: performing the most complex and innovative chemical, physical or biological scientific investigations and studies of major importance to the employer; prepare reports and papers for internal use and external publication; and represent the department at public meetings and conferences.

Conclusion:

1. The existing class specifications are outdated.
2. While many of the proposed tasks are not specifically identified in the existing class specifications, the tasks are applicable to the chemists' scope of work.
3. Subject matter experts (chemists) and program managers confirmed the proposed tasks and scope of work are adequate and accurate.

MINIMUM QUALIFICATIONS

Proposed Chemist Series

All Levels:

Either I

Education: Possession of a Bachelor's or advanced degree with a major in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution. (Admission to a master's or a doctoral degree program in chemistry, biochemistry, toxicology, or a closely related scientific discipline shall be considered to meet these education qualifications.)

Or II

Education: Possession of a Bachelor's or advanced degree with a major in a scientific discipline from a recognized institution with a total of 18 semester units in general chemistry, quantitative analysis, and organic chemistry with related laboratories. (Two years professional experience performing duties as a chemist, as defined in the scope of the specification, may be substituted for the required coursework.)

Proposed Chemist, Range A

Education as indicated above. (Registration as a senior in a recognized institution will admit applicants to the examination, but they must produce evidence of a degree before they can be considered eligible for appointment.)

Existing Class Comparisons

The Junior Chemist and the Agricultural Chemist, Range A, classes were the levels used for comparison to the proposed Chemist, Range A.

Both the Junior Chemist and the Agricultural Chemist, Range A, are equivalent to the proposed Chemist with the exception that the major course of study is more narrowly identified as chemistry or biochemistry.

Proposed Chemist, Range B

One year of satisfactory experience in the California state service performing duties comparable to Chemist, Range A; or two years of comparable professional chemistry experience outside of the California state service. Possession of a master's degree in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution will substitute for the required experience.

Existing Class Comparisons

The Agricultural Chemist, Range B, Public Health Chemist I; Textile Chemist I; and the Petroleum Products Chemist I classes were the levels used for comparison to the proposed Chemist, Range B.

The Agricultural Chemist, Range B, minimum qualifications are comparable to the proposed Chemist, Range B, in most patterns. The exception is under the Alternate Range Criteria, Range B, which allows two years of experience in California state service performing the duties of a Laboratory Technician – Chemical Analysis, and education equivalent to graduation from college with major work in chemistry, will qualify for the Agricultural Chemist, Range B. The Agricultural Chemist minimum qualifications also more narrowly define the college major to chemistry or biochemistry.

The Public Health Chemist I is comparable to the proposed Chemist, Range B, in all but one pattern. The exception is pattern II, which allows three years in California state service performing the duties of a Public Health Laboratory Technician I (Chemical Analysis) and 24 semester units of course work in chemistry or biochemistry required for a major in chemistry or biochemistry at an accredited college or university.

The Petroleum Products Chemist I minimum qualifications are comparable to the proposed Chemist, Range B, with minor exceptions. The Petroleum Products Chemist I minimum qualifications are more specific to the type of experience as it applies to petroleum products: Two years of chemical experience, including one year performing physical/chemical analyses using American Society of Testing and Materials methods for petroleum and automotive products. In addition, one year of post graduate training in chemistry or a related field may be substituted for one year of the required experience. College education is limited to major work in chemistry.

The Textile Chemist I minimum qualifications generally compare to the proposed Chemist, Range B. The promotional pattern was significantly different: One year experience in California state service performing the duties of a Textile Technician II and completion of 15 semester units of laboratory courses in chemical science. The outside pattern for the Textile Chemist I is more specific to the type of experience as it applies to making chemical analysis of textiles and other materials. The college education identified major fields of study in addition to chemistry or biochemistry. They include: physics, chemical engineering, fire science, combustion, or other physical science.

Proposed Chemist, Range C

Two years of satisfactory experience in the California state service performing duties comparable to a Chemist, Range B; or three years of comparable professional chemistry experience outside of the California state service. Possession of a master's degree in

chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution may be substituted for one year of experience; or possession of a doctorate in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution may be substituted for two years of the experience.

Existing Class Comparisons

The Public Health Chemist II, Agricultural Chemist II, Petroleum Products Chemist II, and the Textile Chemist II were the levels used for comparison to the proposed Chemist, Range C.

The Public Health Chemist II minimum qualifications are comparable to the proposed Chemist, Range C, for the promotional pattern. The minimum qualifications also compared to the outside pattern in requiring three years of professional experience in making a wide variety of chemical analyses. However, two of those three years must be related to foods, drugs, water, waste water, air pollutants, or substances potentially hazardous to householders or workers in industry, radiochemistry, or clinical chemistry. One year postgraduate education may substitute for one year of nonspecialized experience; however, there is no experience substitute for possession of a doctorate.

The Agricultural Chemist II minimum qualifications are comparable to the proposed Chemist, Range C, for the promotional pattern. The outside pattern also compared equally; however, one of the three years must have included at least one year in analytical chemistry. One year postgraduate education may substitute for one year of nonspecialized experience; however, there is no experience substitute for possession of a doctorate.

The Petroleum Products Chemist II minimum qualifications are comparable to the proposed Chemist, Range C, for the promotional pattern. The outside pattern also compared equally, however; one year of the required three years was specific to physical/chemical analyses for petroleum and automotive products. One year postgraduate education may substitute for one year of nonspecialized experience; however, there is no experience substitute for possession of a doctorate.

The Textile Chemist II minimum qualifications are comparable to the proposed Chemist, Range C, for the promotional pattern. The outside pattern was equivalent in the number of years of experience; however, it was specific to flammability research and testing or combustion of materials, or making chemical analyses of a variety of textile and other materials used in the manufacture of home furnishing products and components. There was no substitution for experience for postgraduate or doctoral education.

Proposed Staff Chemist

Either I

Two years of experience in the California state service performing duties comparable to those of a Chemist, Range C.

Or II

Five years of increasingly responsible professional experience as a chemist in laboratory analysis, research, management, planning, regulation, or investigation, including responsibility for the development or implementation of analytical methods using complex instrumentation or research projects; or for the direction of the work of a chemical or analytical laboratory staff. (Two years of this experience must be at a level of responsibility equivalent to that of a Chemist, Range C, in the California state service. Possession of a master's degree in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution, may be substituted for one year of the required general experience; possession of a doctorate in the above-named disciplines from a recognized institution may be substituted for two years of the general experience.)

Existing Class Comparisons

The Public Health Chemist III (Specialist) and the Agricultural Chemist III (Specialist) were the levels used for comparison to the proposed Staff Chemist.

The Public Health Chemist III (Specialist) minimum qualifications compared to the proposed Staff Chemist for the promotional pattern. The outside pattern required four years (as opposed to five years for the proposed Staff Chemist) of increasingly responsible chemistry experience, with at least two years related to food and drugs, water, waste water, air pollutants, substances potentially hazardous to householders or workers in industry, radiochemistry, or clinical chemistry and including or supplemented by one year of difficult and complex instrumentation work or methods development and evaluation. One year postgraduate education may substitute for one year of nonspecialized experience; however, there is no experience substitute for possession of a doctorate.

The Agricultural Chemist III (Specialist) minimum qualifications require only one year of experience (as opposed to two years) as an Agricultural Chemist II in California state service for the promotional pattern. The outside pattern requires four years (as opposed to five years for the proposed Staff Chemist) of increasingly responsible chemistry experience, including at least two years related to agricultural chemicals or products. There is no substitution for either postgraduate or doctoral education for experience.

Conclusion:

1. The minimum qualifications of the existing chemist classes are comparable to the proposed Chemist series. Most of the differences discovered relate to the fact that each chemist series is very specific and therefore, the experience required is most specific to that particular field.
2. The proposed Chemist series requires the same type of professional chemistry experience for each equivalent class level; however, the requirements described are more general to encompass all the comparison chemist series.
3. The progressive number of years of education and experience was evaluated for all the chemist classes studied, and it was determined that they are very close to the same (most required either the same number of years or within one year), for

both the inside and outside patterns of each class series and also between each different series (Minimum Qualification Chart, Attachment E).

4. The minimum qualifications for the proposed Chemist series will recognize the value of a doctorate degree and allowed as a substitution for experience. This was not previously provided for in the minimum qualifications of the existing chemist classes.
5. The educational minimum qualifications for the proposed Chemist series have been broadened from that of the existing chemist classes to:
 - a) Incorporate other chemistry related majors.
 - b) Allow other sciences majors with related coursework or chemistry experience.
 - c) Require possession of a college degree due to the professional chemistry work and in recognition of the complexity and sensitivity of the assigned tasks related to that work. The minimum qualifications for both the Textile Chemist I and the Public Health Chemist I had patterns which did not require possession of a college degree.

COMPARISON OF JOB DESCRIPTIONS WITH PROPOSED CHEMIST SPECIFICATION

METHOD

Duty statements representing job descriptions for existing chemist positions from all user departments (CDFA, DHS, DTSC, DFG, DWR, SWRCB, DCA, and ARB) were collected and reviewed against the proposed generalized Chemist specification components. There were no duty statements available for the Junior Chemist or Textile Chemist I classes; therefore, data was not collected or evaluated for these levels. The method of comparison for the duty statements was documented in a work sheet format. Comparisons of the tasks listed were recorded in the following categories: overall scope of chemist work, as well as individual levels of the comparable classes.

SCOPE OF WORK

The scope of work for all four groups of chemist duty statements, at the various levels, was found to be covered as described in the proposed generalized Chemist specification, with the exception of four tasks areas. The tasks that were not clearly identified in the majority of the duty statements were as follows: (1) Conducts literature searches. This was not listed in any duty statement received; (2) Check apparatus and procedures used by field staff. Only two groups of chemist classes identified with this task (Public Health and Textile); (3) Prepare data for court cases. Only two groups of chemist classes identified with this task (Agricultural and Petroleum Products); and (4) Write papers for publications. Only one group identified with this task (Public Health).

ENTRY LEVEL

Duty statements for the Agricultural Chemist were utilized for this level. It should be noted there is no distinction in the duty statements for Agricultural Chemist, which is a deep class (Range A

and B). (As indicated above, Junior Chemist duty statements were not available.) The proposed definition of level (Range A) covered the tasks identified in the duty statements with the exception of three task areas. The tasks that were not clearly identified in a significant portion of the duty statements were as follows: (1) Prepare standard and reagent solutions; (2) Conduct less difficult surveys, investigations, and studies; and (3) Answer questions from the public of a routine nature.

A task listed in the duty statements, but not clearly covered in the proposed generalized Chemist specification was – Follow laboratory safety procedures.

INTERMEDIATE LEVEL

Duty statements for the Agricultural Chemist, Public Health Chemist I, and Petroleum Products Chemist I were utilized for this level. Again, it should be noted there is no distinction in the duty statements for Agricultural Chemist (Range A and B). (As indicated above, Textile Chemist I duty statements were not available.) The proposed definition of level (Range B) covered the tasks identified in the duty statements with the exception of four task areas. The tasks that were not clearly identified in a significant portion of the duty statements were as follows: (1) Perform chemical or biological research of average difficulty; (2) Perform chemical, physical or biological surveys, investigations, or studies of average difficulty; (3) Answer questions from the public of a routine nature; and (4) Prepare regulatory and compliance documents.

Common tasks listed in the duty statements, but not clearly covered in the proposed generalized Chemist specification were: (1) Follow laboratory safety procedures; and (2) Assist in the purchase of laboratory equipment and supplies.

FULL JOURNEY LEVEL

Duty statements for the Agricultural Chemist II, Public Health Chemist II, Textile Chemist II, and Petroleum Products Chemist II were utilized for this level. The proposed definition of level (Range C) covered the tasks identified in the duty statements, with the exception of four task areas. The tasks that were not clearly identified in a significant portion of the duty statements were as follows: (1) Prepare standard and reagent solutions; (2) Perform complex chemical, physical or biological surveys, investigations, or studies; (3) Prepare nonroutine correspondence; and (4) Answer routine or difficult questions from the public. In addition, the description regarding the level of supervision in the duty statements varied such as “Under general supervision” or “Under general direction.” The level of supervision in the proposed generalist Chemist specification for the full journey level is “Under direction.”

Common tasks listed in the duty statements, but not clearly covered in the proposed generalized Chemist specification were: (1) Follow laboratory safety procedures; and (2) Assist in the purchase of laboratory equipment and supplies.

STAFF (SPECIALIST) LEVEL

Duty statements for the Agricultural Chemist III and Public Health Chemist III were utilized for this level. The proposed definition of level (Staff) covered the tasks identified in the duty statements. A portion of the duty statements did not consistently identify the complexity level of the tasks. In addition the description regarding the level of supervision in the duty statements varied such as “Under supervision,” “Under general direction,” or “Under direct supervision.”

The level of supervision in the proposed generalist Chemist specification for the Staff (Specialist) level is “Under direction.”

A common task listed in the duty statements, but not clearly covered in the proposed generalized Chemist specification was – Assist in the purchase of laboratory equipment and supplies.

Isolated tasks listed in the duty statements included: (1) Prepare and track laboratory contracts (invitation to bid, review and select contractors, track and evaluate); and (2) Prepare maps, graphs, and other aids in documenting field activities.

Conclusion:

1. The data collected from the various duty statements is generally consistent with the proposed generalized Chemist specification concept, including scope of work and typical tasks performed at each level.
2. Criterion “a” for the “class test” has been met in that positions appear sufficiently similar in respect to duties and responsibilities that the same descriptive title may be used (for the various class levels).
3. The minor differences between the proposed tasks and those listed in the duty statements are not significant, or are covered broadly under other task statements, or knowledge and ability sections. Management and the select chemist group have confirmed the proposed tasks are appropriate for the various levels and overall scope. The duty statements do not consistently provide the level of detail on the tasks performed.
4. The level of supervision described in the proposed generalized Chemist specification is consistent with DPA Classification and Compensation Manual regarding entry, journey, full journey, and staff specialist levels.

Recommendation:

Proceed with the proposal to establish the consolidated Chemist specification concept.

OTHER CONSIDERATIONS

COMPENSATION

The compensation for each class level in the related chemist group of classes are equivalent. The exceptions are as follows:

1. Petroleum Products Chemist and Textile Chemist classes do not currently have a staff specialist level.
2. The Textile Chemists are not currently included in a recruitment and retention pay differential.

Conclusion:

1. Conversions of the existing chemist classes and compensation levels to the proposed generalized Chemist series are feasible as shown in the attached Chemist Salary Chart (Attachment F).
2. The proposal meets the “class test” criterion “d” in regard to compensation applied with equity.
3. The State and Union agree to proceed as a class consolidation effort only; therefore as a no cost board item.

Recommendation:

No changes are recommended to the salary structure of the chemist levels at this time.

DEPARTMENTAL COMMENTS IN RESPONSE TO SURVEY

The eight user departments surveyed all submitted management responses to the survey questions. To recap, the survey included a series of questions requiring departmental feedback on management’s assessment of the proposed Chemist specification accuracy and adequacy; selection issues; movement of incumbents in the chemist classes for assessment of deep class feasibility; and educational requirements. The summaries of responses are as follows:

A. Proposed Chemist Specification Accuracy and Adequacy

Six of the user departments (ARB, CDFA, DFG, DTSC, DWR, and SWRCB) provided overall comments of support (aside from some minor editorial changes) and confirmation that the proposed class specification would meet their operational needs.

Two of the user departments (DHS and DCA) suggested modifications to portions of the specification to address specific requirements of positions in their departments: (1) Knowledge: flammability properties of textiles, upholstered furniture and bedding; (2) Definition of Series: regulate public and commercial laboratories; (3) Definition of Levels: add “inspections” to Range B/C.

Conclusion:

Specification was modified to incorporate the departmental suggestions. Rather than the specificity of “knowledge of flammability properties of textiles, upholstered furniture and bedding,” the phrase of “. . . and ‘physical’ effects of compounds and substances” was added to the Knowledge Section.

Recommendation:

Proceed with the proposal to establish a consolidated Chemist series specification.

B. Selection

1. Seven departments (ARB, CDFA, DCA, DHS, DTSC, DWR, and SWRCB) determined or agreed the proposed Chemist specification content was sufficient for exam development and application review.
2. One department (DFG) requested clarification on the Minimum Qualifications interpretation (for application review) as follows:
(1) Regarding all levels, educational Pattern II – define “one year” (e.g., does this equal 30 semester units, or 6 semester units); (2) Caution: Quantitative Analysis is no longer offered as a separate class at some colleges. Per UC Davis, chemistry courses ending with A, B, C and Chemistry 105 incorporate quantitative analysis; (3) The term “professional experience” should be defined to ensure consistency.
3. Two departments (CDFA and DTSC) indicated a standardized tool for application review standards (Form 511B, SPB) would be valuable regarding interpretation of the minimum qualifications.

Conclusion:

Specification was modified to incorporate the departmental suggestions. The educational Pattern II was redefined to specify the 18 units in the related course work, and reworded so that there was flexibility in recognizing the quantitative analysis course work when it is incorporated in general or organic chemistry courses. The term “professional experience” was defined as work being within the scope of the specification.

Recommendation:

The user department selection staff will be encouraged to work cooperatively on the development of a Form 511B to ensure consistent interpretation and application of the Minimum Qualifications requirements.

C. Educational Requirements

1. Accredited Colleges: Three of the major user departments strongly supported the requirement that degrees be from accredited colleges. The remaining departments were neutral or silent on the requirement. The analytical instruments currently used in chemical analyses are complex, costly, and highly sophisticated. The departments believe that the accredited colleges will ensure prospective candidates with chemistry and biochemistry degrees have the appropriate background in laboratory instrumentation and laboratory methods.
2. Current incumbents' educational status: Six departments indicated that all of their incumbents, with the exception of two incumbents, have at a minimum a four-year degree in chemistry or related scientific field with appropriate chemistry course work. One department also provided

additional information that 15 out of 16 applicants for a current exam (Textile Chemist I) possess a four-year chemistry degree.

Conclusion:

The four-year degree requirement from an accredited college is supported by departments and it is reasonable to require for this professional chemist classification series. The educational background of existing incumbents supports the four-year degree educational requirement.

Recommendation:

Proceed with establishing minimum qualifications that include recognized (accredited) institutions and provide alternate educational pattern with appropriate chemistry course work.

D. Alternate Range (Deep Class) Criteria

1. Current Departmental Practices:

Two departments indicate incumbents regularly progress through the entry and full-journey levels based upon satisfactory performance and list eligibility. Four departments indicate that while not always automatic, incumbents move upon satisfactory performance and list eligibility into a vacant position or promotion-in-place. Movement is often delayed due to the selection process because of exam delays or not reachable on a list. (Two departments did not provide responses.) All departments indicated receptiveness to creating a deep class to allow automatic movement based on satisfactory performance and eligibility.

2. Budgetary Considerations:

Two departments indicate that entry and full-journey level chemist positions are considered interchangeable from a budgetary stand point. Four departments indicated the cost of chemist promotion-in-place is absorbed by the department. (Two departments did not provide responses.)

Conclusion:

1. Departmental practices of automatically moving incumbents through the levels are varied. Some delays of automatic movement are related to the selection process.
2. There is departmental support for automatic movement from the entry to full-journey chemist level based on the scope of work and budgetary considerations.

Recommendation:

Propose establishment of deep class for entry-level chemist through full-journey level. The scope of work meets a single test of fitness for all alternate range levels and incumbents gain increased competence at each level in performing the duties based on experience and educational background.

OTHER ACTIONS REQUIRED UPON IMPLEMENTATION OF CONSOLIDATION EFFORT

1. Revise the class titles in Pay Differential #239.
2. Advise State Personnel Board of the need to amend SPB Rule 433 (Remove Textile Chemist I and II).

SUMMARY OF CONCLUSIONS

- A. Classification Considerations: The proposed Chemist series describes the performance of physical and chemical analyses to make determinations on substances that impact a department's particular field of study. The specification is written in general terms which describes the standard methods, procedures and tests, practiced by all chemists.

The minimum qualifications and progressive number of years of education and experience for each level is comparable to the four chemist series that will be encompassed by the proposed Chemist series.

A college degree with a major in chemistry, biochemistry, toxicology, or a closely related scientific discipline is warranted due to the professional nature of the work. Recognition for either a master's or doctorate degree will be allowed as a substitution for a portion of the experience.

- B. Job Descriptions: The overall data collected indicates the scope of work and typical tasks performed are consistent with the proposed generalized Chemist series specification.
- C. Compensation: Conversions of the existing chemist classes and compensation levels to the proposed generalized Chemist series are feasible.
- D. Departmental Input: The proposed generalized Chemist series specification, with minor modifications, will meet the needs of each user department regarding:
1. Adequacy and accuracy of scope of work and typical tasks.
 2. Selection purposes for creating individual departmental exams and application review.
 3. Degree requirement of a four-year chemistry degree from a recognized institution.

4. An overwhelming majority of incumbents meet the educational requirements for future movement through the alternate ranges or promotional exam to the higher levels.
 5. Automatic movement from the entry (Range A) to full-journey (Range C) level is supported by management and scope of work.
- E. General Reemployment List Considerations: The proposed generalized Chemist series would result in a variety of departmental chemists potential placement on a General Reemployment List (i.e., due to layoff, departmental restructure, etc.). Because the scope of work and minimum qualifications are applicable to the various chemistry specialties, it is anticipated that employees will be able to readily learn, adapt, and apply methods to specific chemical analyses.

SUMMARY OF RECOMMENDATIONS

- A. Establish a new generalized Chemist series specification, including a deep class concept for the entry to full-journey level (Attachment G).
- B. Move incumbents by board action to the appropriate/equivalent chemist level.
- C. Instruct departmental personnel offices to review alternate range criteria and move incumbents to the appropriate alternate range on a case-by-case basis.
- D. Use the existing salary ranges for the corresponding generalized Chemist level, with Union concurrence.
- E. Revise the class titles in Pay Differential #239.
- F. Advise the State Personnel Board of the need to amend SPB rule 433 (Remove Textile Chemist I and II).

CALIFORNIA STATE PERSONNEL BOARD

specification

CHEMIST

Series Specification

(Established June 4, 1959)

SCOPE

This series specification describes three classifications in the Chemist series.

Schem	Class	
<u>Code</u>	<u>Code</u>	<u>Class</u>
TD75	8002	Chemist
TD55	8038	Staff Chemist
TD50	8031	Senior Chemist

DEFINITION OF SERIES

This series specification describes three chemist classifications used to perform a broad range of staff and supervisory work concerning environmental protection, natural resources, consumer

protection, and environmental or public health. Incumbents perform or supervise chemical analyses to identify the concentration of substances that may be constituents, adulterants, contaminants, or potentially hazardous chemicals in the environment, food, consumer products, environmental, biological tissues and fluids, hazardous waste, or industrial and agricultural commodities; assist and consult on collection of field samples; use, modify and develop methods for chemical, physical, or biological analysis; evaluate laboratory equipment and procedures; review and evaluate data from internal or external sources; conduct literature searches; perform quality assurance; check apparatus and procedures used by field staff; provide consultation and analytical determinations to Federal, state, and local officials for the enforcement of laws relating to consumer, industrial and agricultural commodities and in the identification and control of contaminants and pollutants in California's environment; interpret results of laboratory analyses and other findings; prepare data for court cases and act as a technical witness; write papers for publication; prepare reports, manage data archives and information systems.

FACTORS AFFECTING POSITION ALLOCATION

Level, variety, and complexity of assigned work; independence of action; degree of public and interagency contact; amount of supervision exercised or received; degree to which decisions are sought and accepted by top management; reporting relationships; extent of impact; and consequence of error.

DEFINITION OF LEVELS

CHEMIST

This class is the entry, intermediate, and full journey level of the series. Range A is the entry and first working level of the class. Under close supervision, incumbents perform a variety of the less difficult and responsible professional scientific, laboratory, office, and field work.

Following detailed instructions and specific procedures, incumbents perform chemical, physical, or biological analyses; prepare standard and reagent solutions and samples for analysis; conduct less difficult surveys, investigations, and studies; draft preliminary reports; and routine correspondence; perform basic maintenance of equipment and laboratory instrumentation; answer questions from the public of a routine nature; and do other related work. Work at this level is characterized by a reliance on detailed instructions and assistance from lead persons and supervisors in the application of proven techniques and methodologies to assigned work.

Range B is the intermediate working level of the class. Under general supervision, incumbents perform a variety of responsible professional, scientific, laboratory, office, and field work of average difficulty. Incumbents perform chemical, physical, and biological analyses, research, surveys, investigations, and studies of average difficulty; prepare standard and reagent solutions and samples for analysis; maintain equipment and laboratory instrumentation; troubleshoot equipment problems; write preliminary reports and routine correspondence; answer questions from the public of a routine nature; prepare regulatory and compliance documents; and do other

related work. Work at this level is characterized by a reliance on proven techniques and methodologies.

Range C is the full journey level. Under direction, incumbents perform a variety of responsible professional scientific, laboratory, office, and field work. Incumbents independently perform complex chemical, physical, and biological analyses, research, surveys, investigations, and studies; prepare standard and reagent solutions and samples for analysis; write final reports; prepare regulatory and compliance documents; operate and maintain equipment and laboratory instrumentation including the more complex laboratory equipment; prepare non-routine correspondence; answer routine or difficult questions from the public; and do other related work. Incumbents allocated to this level perform a variety of tasks, including the more responsible, varied, and complex assignments; consult and advise public and private entities. Incumbents at this level often independently develop and implement new and advanced techniques and methodologies. Incumbents may be assigned lead responsibility for a specific project or assignment.

STAFF CHEMIST

The Staff Chemist is the specialist level of the series requiring scientific expertise above the full journey level. Incumbents independently identify problems, develop courses of action, and conduct the most complex and innovative scientific investigations and studies on issues of major importance to the employer, and do other related work. Incumbents operate and maintain the most complex equipment and laboratory instrumentations; plan and conduct research; originate

and evaluate experimental methods; and make interpretative analyses of data. Prepare reports and papers for internal use and external publication; represents the department at public meetings and conferences. Incumbents may be assigned lead responsibility for a specific project, program, function, or area of expertise.

SENIOR CHEMIST

This is the supervisory level. Incumbents supervise and direct the work of professional or technical staff, and do other related work. Under general direction, incumbents plan, organize, coordinate, and direct the work of a laboratory or program unit; perform administrative work such as budget, operational planning, and equipment specifications and purchasing; evaluate and implement new analytical methods and procedures; ensure quality assurance and laboratory safety; select and train staff; evaluate staff performance and take or recommend appropriate action. The greatest portion of time is spent performing administrative and supervisory duties.

MINIMUM QUALIFICATIONS

ALL LEVELS:

Education: Possession of a Bachelor's or advanced degree with a major in chemistry, biochemistry, toxicology, or a closely-related scientific discipline. (Admission to a master's or a doctoral degree program in chemistry, biochemistry, toxicology, or a closely related scientific discipline, shall be considered to meet these education qualifications.)

CHEMIST

Education as indicated above. (Registration as a senior in a recognized institution will admit applicants to the examination, but they must produce evidence of a degree before they can be considered eligible for appointment.)

STAFF CHEMIST

SENIOR CHEMIST

Either I

Experience: Two years of experience in the California state service performing the duties of a Chemist, Range C.

Or II

Experience: Five years of increasingly responsible professional experience as a scientist in laboratory analysis, research, management, planning, regulation, or investigation, including responsibility in the development or implementation of analytical methods using complex instrumentation or research projects; or in the direction of the work of a chemical or analytical laboratory staff. (Two years of this experience must be at a level equivalent to that of a Chemist, Range C, in the California state service. Possession of a master's degree in chemistry, biochemistry, toxicology, or a closely related scientific discipline, may be substituted for one year of the required general experience; possession of a doctorate in the above-named disciplines may be substituted for two years of the general experience.)

KNOWLEDGE AND ABILITIES

CHEMIST

Knowledge of: Fundamentals of organic, inorganic, analytical, and physical chemistry and biochemistry; principles, procedures, and equipment; quantitative and qualitative analyses and instrumental methods of analyses; toxic effects of compounds and substances; methods of instrumental analysis; learn, interpret, and apply provisions of applicable laws, rules, or regulations; principles of personnel management and supervision; statistics, report writing, and research methods and procedures.

Ability to: Perform accurate chemical analyses following standardized methods; set up, adjust, calibrate, trouble-shoot, and maintain instruments; analyze and interpret test information; analyze situations accurately and report results; modify and/or develop analytical procedures for specific needs; prepare and present evidence in court; testify as an expert witness; conduct research work; prepare reports and papers for publication; analyze situations accurately and take effective action; ability to maintain accurate records.

STAFF CHEMIST

Knowledge of: Characteristics, properties, and uses of a wide variety of agricultural, industrial, consumer, and agricultural chemicals and products; hazardous materials; analytical, physical, organic, and inorganic chemistry and biochemistry; toxic effects of compounds and substances;

instrumentation methodology and analyses; research and development, and alternate test methods; quality assurance; provisions of applicable laws, rules, or regulations; court procedures and rules of evidence.

Ability to: Select and modify instruments and other equipment; develop new, and modify existing analytical methods and procedures; plan, direct, and conduct research and development; perform difficult and complex chemical and related physical analyses; prepare reports and papers for internal distribution and official publication; assist with investigations and prosecutions of violations of state and Federal laws and regulations; act as an expert witness; analyze situations accurately and take effective action.

SENIOR CHEMIST

Knowledge of: All of the above, and principles of effective supervision and budgeting; the Equal Employment Opportunity objectives; a supervisor's role in the Equal Employment Opportunity program.

Ability to: All of the above, and organize and direct the work of a staff of professional chemists and technical assistants and select, train, and supervise personnel; analyze complex situations accurately and adopt effective course of action.

ALTERNATE RANGE CRITERIA

Range A. This range shall apply to incumbents who do not meet the Range B or Range C criteria.

Range B. One year of satisfactory experience in the California state service performing duties comparable to Chemist, Range A; or two years of professional scientific experience in _____

outside of the California state service. Possession of a master's degree in chemistry, biochemistry, toxicology, or a closely related scientific discipline will substitute for the required experience.

Range C. Two years of satisfactory experience in the California state service performing duties comparable to a Chemist, Range B; or three years of professional scientific experience in _____

outside of the California state service. Possession of a master's degree in chemistry, biochemistry, toxicology, or a closely related scientific discipline may be substituted for one year of experience; or possession of a doctorate in chemistry, biochemistry, toxicology, or a closely related scientific discipline may be substituted for two years of the experience.

Minimum Qualifications for the Chemist Series

I

Chemist, Range A Comparison

Class	Chemist	Progressive # of Years	Jr. Chemist	Progressive # of Years	Agri Chem, Range A	Progressive # of Years
Inside Pattern	0	0	0	0	0	0
Outside Pattern	All levels BS Degree w/major in Chem, biochem, toxi, or closely related sci discipline Or BS Degree w/major in sci disc, w/total of 18 semester units in gen chemistry, quantitative analysis and organic chemistry w/related labs. (2 yrs prof exp performing chem. duties may substitute for coursework *early entry feature	4 yrs 4 yrs	Equivalent to grad from college with major in chemistry or biochemistry *early entry feature	4 yrs	Equivalent to grad from college with major work in chemistry or biochemistry *early entry feature	4 yrs

Legend: 4yrs = BA/BS; 5yrs = MS; 10yrs = PhD

Minimum Qualifications for the Chemist Series

Chemist, Range B, Minimum Qualifications Comparison

Class	Chemist, Range B	Progressive # of Years	Public Health Chem I	Progressive # of Years	Agri Chem, Range B	Progressive # of Years	Petroleum Products Chem I	Progressive # of Years	Textile Chem I	Progressive # of Years
Inside Pattern	All mq requirement of Chemist, Rg A, and 1 yr satisfactory exp performing duties comp to Chemist, Rg. A.	5 yrs	1 yr of exp in CA State Svc perform duties of a Jr. Chem, <u>or</u> 3 yrs in CA State Svc perform duties of a Public Health Lab Tech I (Chem Analysis) and 24 sem units of course work in chem. or biochem required for a major in chem. or biochem at accredited college	5 yrs 5 yrs	1 yr of experience in CA State Svc perform duties of Jr. Chem, <u>or</u> 1 yr exp in CA State Svc perform duties of Ag Chem, Rg. A 2 yrs of exp in CA State Svc perform duties of Lab Tech-Chem Analysis and educ equiv to grad from college with major work in chem	5 yrs 5 yrs 6 yrs	1 yr of exp in CA State Svc perform duties at level equiv to Jr. Chem <u>or</u>	5 yrs	1 yr exp in CA State Svc perform duties of a Textile Tech II; and 15 sem units of lab courses in chem. science.	4 - 5 yrs

Minimum Qualifications for the Chemist Series

Outside Pattern	All mq requirement of Chemist Rg. A, and 2 yrs prof chem. Exp outside of CA State svc. (poss of Master's in related sci disc may substitute for req exp.)	6 yrs	Possesion of a Master's degree in chem. or a closely related field. (* early entry feature.) <u>or</u> 2 yrs of prof chem. exp include 1 yr in analytical chem. (1 yr post grad training in chem. or related field may be substituted for 1 yr of req exp) and equiv to grad from college with major work in chem., biochem, or closely related field.	5 yrs 6 yrs	Possession of a master's degree, <u>or</u> 2 yrs of chemical exp, including 1 yr analytical chem. And education equivalent to grad from college with major work in chem. or biochem, <u>or</u>	5 yrs 6 yrs	2 yrs chem. exp, include 1 yr perform physical/chem analyses using American Society for Testing and Materials methods for petroleum and automotive products. (1 yr post grad training in chem. or related field may be substituted for 1 yr required exp.) and equiv to grad from college with major work in chem.	6 yrs	2 yrs of prof exp in making chem. anal of a variety of textile and other materials used in the manufacture of home furnishing products and components; and equiv to grad from college with major work in chem. or biochem, physics, chemical engineering, fire science, combustion, or other physical science.	6 yrs
-----------------	---	-------	---	--------------------------------	---	--------------------------------	--	-------	--	-------

Legend: 4yrs = BA/BS; 5yrs = MS; 10yrs = PhD

Minimum Qualifications for the Chemist Series

Chemist, Range C, Minimum Qualifications Comparison

Class	Chemist, Range C	Progressive # of Years	Public Health Chem II	Progressive # of Years	Agri Chem II	Progressive # of Years	Petroleum Products Chem II	Progressive #of Years	Textile Chem II	Progressive # of Years
Inside Pattern	All mq requirement of Chemist, Rg A, and 2 yrs satisfactory exp perform duties comp to Chemist, Rg. B.	7 yrs	2 yrs exp in CA State Svc perform duties of a Public Health Chem I; or	7-8 yrs	1 yr exp in CA State Svc perform duties of Ag Chem, Rg B; or	6 yrs	1 yr exp in CA State Svc perform duties of a Petroleum Products Chem I; or	6 yrs	1 yr exp in the CA State Svc perform duties of a Textile Chem I; or	5-6 yrs
Outside Pattern	All mq requirement of Chemist Rg. A, and 3 yrs prof chem. Exp outside of CA State svc. (poss of Master's in related sci disc may substitute for 1 yr of exp.; or poss of a doctorate in related sci disc may substitute for 2 yrs exp)	7 yrs	3 yrs of prof exp in making wide variety of chem. analyses, 2 yrs which shall have been related to foods and drugs, water, waste water, air pollutants, substances potentially hazardous to householders or workers in industry, radiochemistry, or clinical chem. (1 yr post grad training in chem. or related field may be substituted for 1 yr of nonspecialized exp.), and equivalent to grad from college with major work in chem., biochem, or related field.	7 yrs	3 yrs exp in chem. or biochem analyses which must have included at least 1 yr in analytical chem. (1 yr post grad train in chem or related field may be substituted for 1 yr of req nonspecialized exp.) and equivalent to grad from college with major work in chem. or biochem.	7 yrs	3 yrs of exp in chem analyses which must have included at least 1 yr performing physical/chem analyses using American Society for Testing and Materials methods for petroleum and automotive products. (1 yr post grad training in chem. or related field may be substituted for 1 yr of the required nonspecialized exp) and equivalent to grad from college with major work in chem.	7 yrs	3 yrs of progressive responsible professional exp in flammability research and testing or combustion of materials; or making chem. analyses of a variety of textile and other materials used in the manufacture of home furnishing products and components; and equivalent to grad from college with major work in chem., biochem, physics, chem. engineering, fire science, combustion, or other physical science.	7 yrs

Legend: 4yrs = BA/BS; 5yrs = MS; 10yrs = PhD

Minimum Qualifications for the Chemist Series

Staff Chemist, Minimum Qualifications Comparison

Class	Staff Chemist	Progressive # of Years	Public Health Chem III (Specialist)	Progressive # of Years	Agri Chem III (Specialist)	Progressive # of Years
Inside Pattern	2 yrs exp in CA State Svc perform duties comparable to Chem, Rg C	9 yrs	2 yrs exp in CA State Svc perform duties of Public Hlth Chem II; or	9-10 yrs	1 yr exp in CA State Svc perform duties of Ag Chem II; or	7 yrs
Outside Pattern	5 yrs of increasingly resp prof exp as a chemist in lab analysis, research, mgmt, planning, regulation, or invest, including resp for the develop or implementation of analytical methods using complex instrumentation or resrch projects; or for direction of work of chem or analytical lab staff (2 yrs of exp must be level of resp equiv to Chem, Rg C, in CA State Svc. (Poss of master's degree in chem., biochem, toxicology, or closely related sci disc, may be substituted for 1 yr of req gen exp; poss of doctorate in disciplines may be substituted for 2 yrs gen exp.)	9 yrs	4 yrs increasingly resp chem. exp prefer in analytical chem, inc at least 2 yrs related to foods and drugs, water, waste water, air pollutants, substances potentially hazardous to householders or workers in industry, radiochemistry, or clinical chem. and inc or supplemented by 1 yr of difficult and complex instrumentation work or methods development and evaluation. (1 yr post grad training in chem or related field may be substituted for 1 yr non-specialized exp.) and equiv to grad from college with major work in chem. or biochem or related field.	8 yrs	4 yrs of increasingly resp chem. exp, prefer in analytical chem., inc at least 2 yrs related to ag chem or products and inc or supplemented by 1 yr of diff and comp instrumentation work or methods developmnt and eval; and equiv to grad from college with major work in chem. or biochem.	8 yrs

Legend: 4yrs = BA/BS; 5yrs = MS; 10yrs = PhD

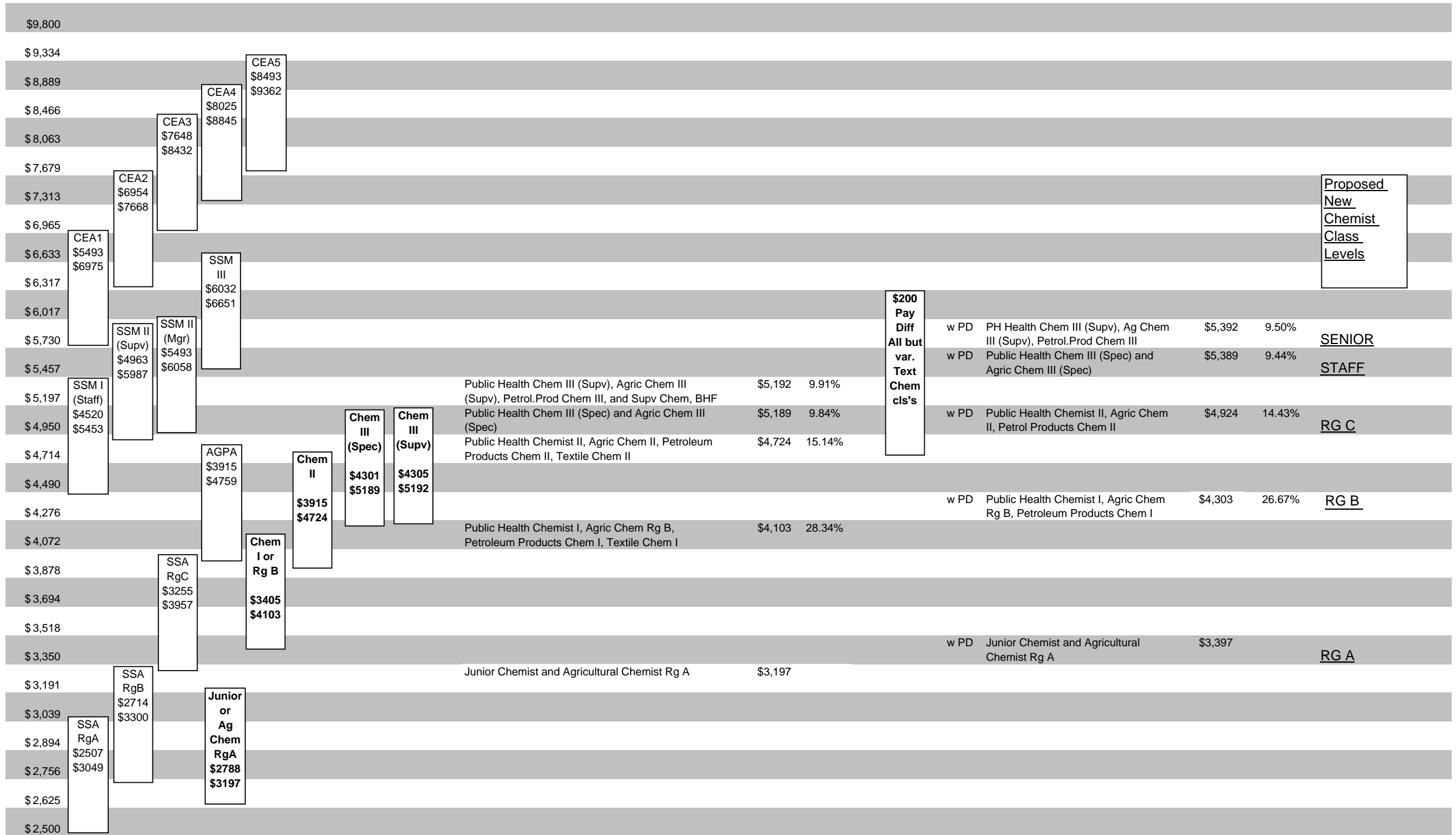
Minimum Qualifications for the Chemist Series

Supervising Chemist, Minimum Qualifications Comparison

Class	Supervising Chemist	Progressive # of Years	Public Health Chem III (Supervisor)	Progressive # of Years	Agri Chem III (Supervisor)	Progressive # of Years	Petroleum Products Chemist III	Progressive # of Years	Supervising Chemist, Bureau of Home Furnishings	Progressive # of Years
Inside Pattern	2 yrs exp in CA State Svc perform duties comparable to Chem, Rg C	9 yrs	2 yrs exp in CA State Svc perform duties of a Public Health Chem II; or	9-10 yrs	1 yr exp in CA State Svc perform duties of an Agricultural Chemist II; or	7 yrs	1 yr exp in CA State Svc perform duties of a Petroleum Products Chem II; or	7 yrs	1 yr of exp perform duties of a Textile Chem II in CA State Svc; or 2 yrs exp perform duties of a Textile Chem I in CA State Svc; or	6-7 yrs 6-7 yrs
Outside Pattern	5 yrs of increasingly resp prof exp as a chemist in lab analysis, research, mgmt, planning, regulation, or invest, including resp for the develop or implementation of analytical methods using complex instrumentation or resrch projects; or for direction of work of chem or analytical lab staff (2 yrs of exp must be level of resp equiv to Chem, Rg C, in CA State Svc. (Poss of master's degree in chem., biochem, toxicology, or closely related sci disc, may be substituted for 1 yr of req gen exp; poss of doctorate in disciplines may be substituted for 2 yrs gen exp.)	9 yrs	4 yrs prof chem. exp in making difficult anal related to foods and drugs chemistry, sanitary chemistry, air or industrial hygiene, radiochemistry, or clinical chemistry, 2 yrs must have been in a recognized supervisory capacity. (Possession of master's degree in Chem or closely related field from a recognized university may be substituted for the 2 yrs of non-supervisory exp.) and equiv to grad from college with major work in chemistry, biochem, or related field.	8 yrs	4 yrs increasingly resp chemical exp, preferably in analytical chem including at least 2 yrs related to agricultural chemicals or products and including or supplemented by 1 yr in the supervision of technical personnel and difficult and complex instrumentation or methods developmnt and evaluation. (1 yr post grad training in chem. or related field may be substituted for 1 yr of required non-supervisory, non-specialized exp.) and equiv to grad from college with major work in chem or biochem.	8 yrs	4 yrs of inc resp chem. exp in perform physical/chem. analyses including at least 2 yrs related to petroleum and automotive chemicals or products using American Society for Testing and Materials methods for petroleum and automotive products, and inc or supplemented by 1 yr of difficult and complex instrumentation work or methods developmnt and eval.; and equiv to grad from college with major work in chem.	8 yrs	3 yrs progressive responsible professional exp in making chem. analyses of a variety of textile and other materials used in manufacture of home furnishings products and component; and equiv to grad from college with major work in chemistry, physics, chem. engineering, fire science, combustion, or other physical science.	7 yrs

Legend: 4yrs = BA/BS; 5yrs = MS; 10yrs = PhD

Chemist Salary Chart



Proposed
New
Chemist
Class
Levels

\$200
Pay
Diff
All but
var.
Text
Chem
cls's

CALIFORNIA STATE PERSONNEL BOARD

SPECIFICATION

CHEMIST
Series Specification
(Established _____)

SCOPE

<u>Schem</u> <u>Code</u>	<u>Class</u> <u>Code</u>	<u>Class</u>
TG05	8060	Chemist
TG10	8068	Staff Chemist
TG15	8070	Supervising Chemist

DEFINITION OF SERIES

This series specification describes three chemist classifications used to perform a broad range of staff and supervisory chemistry work concerning agricultural, environmental, natural resources, or consumer protection, and environmental or public health. Incumbents perform or supervise chemical analyses to identify the concentration of substances that may be constituents, adulterants, contaminants, or potentially hazardous chemicals in the environment, food, consumer products, biological tissues and fluids, hazardous waste, or industrial and agricultural commodities; assist and consult on collection of field samples; use, modify, and develop methods for chemical, physical, or biological analysis; evaluate laboratory equipment and procedures; regulate public and commercial laboratories; review and evaluate data from internal or external sources; conduct literature searches; perform quality assurance; check apparatus and procedures used by field staff; provide consultation and analytical determinations to Federal, State, and local officials for the enforcement of laws relating to consumer, industrial, and agricultural commodities and in the identification and control of contaminants and pollutants in California's environment; interpret results of laboratory analyses and other findings; prepare data for court cases and act as a technical witness; write papers for publication; prepare reports; manage data archives and information systems; and perform other related work.

FACTORS AFFECTING POSITION ALLOCATION

Level, variety, and complexity of assigned work; independence of action; degree of public and interagency contact; amount of supervision exercised or received; degree to which decisions are sought and accepted by top management; reporting relationships; extent of impact; and consequence of error.

DEFINITION OF LEVELS

CHEMIST

This class is the entry, intermediate, and full journey level of the series. Range A is the entry and first working level of the class. Under close supervision, incumbents perform a variety of the less difficult and responsible professional chemistry work within a laboratory, office, or field setting. Following detailed instructions and specific procedures, incumbents perform chemical, physical, or biological analyses; prepare standard and reagent solutions and samples for analysis; conduct less difficult surveys, investigations, inspections, and studies; draft preliminary reports and routine correspondence; perform basic maintenance of equipment and laboratory instrumentation; answer questions from the public of a routine nature; perform quality control and assurance checks; serve as a technical witness; and do other related work. Work at this level is characterized by a reliance on detailed instructions and assistance from lead persons and supervisors in the application of proven techniques and methodologies to assigned work.

Range B is the intermediate working level of the class. Under general supervision, incumbents perform a variety of responsible professional chemistry work of average difficulty within a laboratory, office, or field setting. Incumbents perform chemical, physical, or biological analyses, research, surveys, investigations, inspections, and studies of average difficulty; prepare standard and reagent solutions and samples for analysis; maintain equipment and laboratory instrumentation; troubleshoot equipment problems; write preliminary reports and routine correspondence; answer questions from the public of a routine nature; prepare regulatory and compliance documents; perform quality control and assurance checks; serve as a technical witness; and do other related work. Work at this level is characterized by a reliance on proven techniques and methodologies.

Range C is the full journey level. Under direction, incumbents perform a variety of responsible professional and complex chemistry work within a laboratory, office, or field setting. Incumbents independently perform complex chemical, physical, or biological analyses, research, surveys, investigations, inspections, and studies; prepare standard and reagent solutions and samples for analysis; write final reports; prepare regulatory and compliance documents; operate and maintain equipment and laboratory instrumentation including the more complex laboratory equipment; prepare nonroutine correspondence; answer routine or difficult questions from the public; perform quality control and assurance checks; serve as a technical witness; and do other related work. Incumbents allocated to this level perform a variety of tasks, including the more responsible, varied, and complex assignments; consult and advise public and private entities.

Incumbents at this level often independently develop and implement new and advanced techniques and methodologies. Incumbents may be assigned lead responsibility for a specific project or assignment.

STAFF CHEMIST

The Staff Chemist is the specialist level of the series requiring scientific expertise above the full journey level. Under direction, incumbents independently identify problems, develop courses of action, and conduct the most complex and innovative chemistry work, including investigations, inspections, and studies on issues of major importance to the employer, and do other related work. Incumbents operate and maintain the most complex equipment and laboratory instrumentations; plan and conduct research; originate and evaluate experimental methods; make interpretative analyses of data; prepare reports and papers for internal use and external publication; represent the department at public meetings and conferences; and serve as an expert witness as necessary. Incumbents may be assigned lead responsibility for a specific project, program, function, or area of expertise.

SUPERVISING CHEMIST

Under general direction, incumbents plan, organize, supervise, and direct the work of a small to medium group of professional chemists and technical staff in a laboratory or program unit. Incumbents research, evaluate, and implement new analytical methods and procedures, oversee and perform complex chemical and physical analyses, and prepare related reports; ensure quality assurance and laboratory safety; select and train staff; evaluate and make recommendations on staff performance; oversee the purchase laboratory supplies; prepare equipment specifications; assist in budget preparation; prepare or make recommendations on operational plans; and perform other related work.

MINIMUM QUALIFICATIONS

ALL LEVELS:

Either I

Education: Possession of a Bachelor's or advanced degree with a major in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution. (Admission to a master's or a doctoral degree program in chemistry, biochemistry, toxicology, or a closely related scientific discipline shall be considered to meet these education qualifications.)

Or II

Education: Possession of a Bachelor's or advanced degree with a major in a scientific discipline from a recognized institution with a total of 18 semester units in general chemistry, quantitative analysis, and organic chemistry with related laboratories. (Two years professional

experience performing duties as a chemist, as defined in the scope of this specification, may be substituted for the required coursework.)

CHEMIST

Education as indicated above. (Registration as a senior in a recognized institution will admit applicants to the examination, but they must produce evidence of a degree before they can be considered eligible for appointment.)

STAFF CHEMIST

SUPERVISING CHEMIST

Either I

Experience: Two years of experience in the California state service performing duties comparable to those of a Chemist, Range C.

Or II

Experience: Five years of increasingly responsible professional experience as a chemist in laboratory analysis, research, management, planning, regulation, or investigation, including responsibility for the development or implementation of analytical methods using complex instrumentation or research projects; or for the direction of the work of a chemical or analytical laboratory staff. (Two years of this experience must be at a level of responsibility equivalent to that of a Chemist, Range C, in the California state service. Possession of a Master's Degree in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution may be substituted for one year of the required general experience; possession of a Doctorate in the above-named disciplines from a recognized institution may be substituted for two years of the general experience.)

KNOWLEDGE AND ABILITIES

CHEMIST

Knowledge of: Fundamentals of organic, inorganic, analytical, and physical chemistry and biochemistry; principles, procedures, instruments, and equipment used in quantitative and qualitative analyses; quality control and assurance; toxic and physical effects of compounds and substances; applicable laws, rules, or regulations; statistics, report writing, and research methods and procedures; and personal computer and related office and instrument software.

Ability to: Communicate effectively; perform accurate chemical analyses following standard to complex methods; set up, adjust, calibrate, trouble-shoot, and maintain instruments; analyze and interpret test information; use, modify, or develop analytical procedures for specific needs; prepare and present evidence in court; testify as a witness; participate in research studies; prepare reports and papers for presentation or publication; analyze situations accurately and take effective action; maintain accurate records; inspect laboratories and make recommendations; use a personal computer and related office and instrument software; and learn, interpret, and apply applicable laws, rules, and regulations.

STAFF CHEMIST

Knowledge of: All of the above, and characteristics, properties, and uses of a wide variety of agricultural, industrial, and consumer chemicals and products; hazardous materials; most complex instrument methodology and analyses; and research, development, and alternate test methods.

Ability to: Select and modify the most complex instruments and other equipment; develop new and modify existing analytical methods and procedures; coordinate quality control and assurance programs; plan, conduct, and direct research studies; perform the most difficult and complex chemical and related physical analyses; prepare reports and papers for internal distribution and official publication; provide information to assist with investigations and prosecutions of violations of State and Federal laws and regulations; act as an expert witness; and act as a lead chemist.

SUPERVISING CHEMIST

Knowledge of: All of the above, and principles and practices of effective supervision; budgeting process and techniques; operational planning; and a supervisor's responsibility for promoting equal opportunity in hiring and employee development and promotion, and for maintaining a work environment that is free of discrimination and harassment.

Ability to: All of the above, and plan, organize, supervise, and direct the work of a staff of professional chemists and technical assistants; select and train staff; analyze complex situations accurately and adopt effective courses of action; ensure quality assurance and laboratory safety; establish and maintain cooperative relationships with departmental representatives and other agency

representatives; oversee the purchase of laboratory supplies; prepare equipment specifications; assist in budget preparation; prepare or make recommendations on operational plans; and effectively promote equal opportunity in employment and maintain a work environment that is free of discrimination and harassment.

Class History

<u>Class</u>	<u>Date Established</u>	<u>Date Revised</u>	<u>Title Changed</u>
Chemist		--	--
Staff Chemist		--	--
Supervising Chemist		--	--

ALTERNATE RANGE CRITERIA 436

CHEMIST

Established _____

Experience or education used to meet the minimum qualifications or alternate range criteria requirements shall not be used for subsequent movement through the Alternate Range Criteria.

Range A. This range shall apply to incumbents who do not meet the Range B or Range C criteria.

Range B. One year of satisfactory experience in the California state service performing duties comparable to Chemist, Range A; or two years of comparable professional chemistry experience outside of the California state service. Possession of a master's degree in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution will substitute for the required experience.

Range C. Two years of satisfactory experience in the California state service performing duties comparable to a Chemist, Range B; or three years of comparable professional chemistry experience outside of the California state service. Possession of a master's degree in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution may be substituted for one year of experience; or possession of a doctorate in chemistry, biochemistry, toxicology, or a closely related scientific discipline from a recognized institution may be substituted for two years of the experience.

When the requirements for the particular criteria are met and upon recommendation of the appointing power, the employee shall receive a rate under the provisions of Department of Personnel Administration Rule 599.676.