



STATE OF COLORADO

CLASS SERIES DESCRIPTION

July 1, 2008

PHYSICAL SCIENCE RESEARCHER/SCIENTIST

I3B11* TO I3B6**

Specialty Areas

- | | |
|----------------|-----------------------|
| A. Cartography | E. Industrial Hygiene |
| B. Chemistry | F. Meteorology |
| C. Geology | G. Other Science |
| D. Hydrology | |

DESCRIPTION OF OCCUPATIONAL WORK

This class series uses six levels in the Physical Science and Engineering Occupational Group and describes research or the practical application of theory, principles, and models in the physical sciences. Researchers plan and conduct research into theory in order to formulate new theory and increase the basic knowledge of a science. Scientists plan, devise, and conduct data collection or testing methods to understand a problem and its cause and to determine the means to comply with program or regulatory standards or requirements. Scientists also apply the results to recommend policies, strategies, solutions, and institutional arrangements for the planning, implementing, and evaluating of the agency's programs. Work includes designing experiments, methodologies, and techniques to detect, discover, measure, and analyze data on a previously unobserved phenomena or to replicate the findings of other research efforts; or, developing the methods and techniques to collect data, conducting surveys, studies, and tests, and analyzing and interpreting data and studies. Positions in this class write reports and prepare briefings or presentations explaining the use, analysis, and results of their work, including the applicability, efficiency, and accuracy of the methods used by other findings, the effectiveness of theory and models in practice, or the enforcement of regulations. In addition, some research positions may locate and obtain funding for their research efforts.

INDEX: Physical Science Researcher/Scientist Intern and Physical Science Researcher/Scientist I begin on page 2, Physical Science Researcher/Scientist II begins on page 3, and Physical Science Researcher/Scientist III begins on page 5, Physical Science Researcher/Scientist IV begins on page 7, and Physical Science Researcher/Scientist V begins on page 9.

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PHYSICAL SCIENCE RESEARCHER/SCIENTIST INTERN I3B1I*

CONCEPT OF CLASS

This class describes the entry level. Work is designed to train positions for a higher level in the class series. Although tasks are similar to those of higher levels, assignments are structured and performed with direction and assistance from others. Positions carry out established work processes and operations by learning to apply and follow procedures, techniques, rules, and regulations. Once training has been completed, the position is to be moved to the next level. Positions should not remain in this class indefinitely.

PHYSICAL SCIENCE RESEARCHER/SCIENTIST I I3B2T*

CONCEPT OF CLASS

This class describes the first working level. Typically, positions perform portions of the research assignment or study, such as performing experiments or collecting source data and analyzing it, where the methodologies have been designed, and will be checked, by a higher level researcher/scientist. Any changes to the original research designs or study plans require prior approval from a higher level. Some positions in this class are also responsible for ordering lab supplies and maintaining lab equipment.

FACTORS

Allocation must be based on meeting all of the four factors as described below.

Decision Making -- The decisions regularly made are at the operational level, as described here. Within limits set by the specific process, choices involve deciding what operation is required to carry out the process. This includes determining how the operation will be completed. For example, positions in this level determine the practical techniques or approach to collect required data, choose the software and validation techniques when devising the procedure to analyze data, and write assigned portions of reports or proposals. By nature, data needed to make decisions are numerous and variable so reasoning is needed to develop the practical course of action within the established process. For example, the work focuses on applying theory and techniques to the practical aspects of the specific field or program of research. Choices are within a range of specified, acceptable standards, alternatives, and technical practices.

Complexity -- The nature of, and need for, analysis and judgment is patterned, as described here. Positions study scientific reports and data to determine what it means and how it fits together in order to get practical solutions in the form of a specific analysis or data collection method to use for a particular assignment. Guidelines in the form of a hypothesis and research plan, regulations and standards, experiment or study designs, protocols and techniques, software packages, and instructions exist for most situations. Judgment is needed in locating and selecting the most appropriate of these guidelines which may change for varying circumstances as the task is repeated. This selection and interpretation of guidelines involves choosing from alternatives where all are correct but one is better than another

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depending on the given circumstances of the situation. For example, the specific protocol used for collecting data may vary by research or study subjects and samples.

Purpose of Contact -- Regular work contacts with others outside the supervisory chain, regardless of the method of communication, are for the purpose of either of the following:

Exchanging or collecting information with contacts. This involves giving learned information that is readily understandable by the recipient or collecting factual information in order to solve factual problems, errors, or complaints. For example, positions explain the purpose of the research or study and its procedure to subjects, collect data from subjects, and exchange information or data with other labs, research projects, or regulatory bodies.

Detecting, discovering, exposing information, problems, violations or failures by interviewing or investigating where the issues or results of the contact are not known ahead of time. For example, in interviewing subjects during an experiment or study, positions persuade subjects to cooperate or resolve problems with the subject's understanding by interpreting and probing for information.

Line/Staff Authority -- The direct field of influence the work of a position has on the organization is as an individual contributor. The individual contributor may serve on a collaborative problem-solving team.

PHYSICAL SCIENCE RESEARCHER/SCIENTIST II

I3B3**

CONCEPT OF CLASS

This class describes the fully-operational level. Positions in this level develop research or study plans, including formulating hypotheses, designing experiments or studies, devising and testing data collection procedures, defining suitable subjects or samples and the procedures to solicit participation, and evaluating and interpreting source data. Some positions may contribute to preparation of grant applications by writing assigned portions of a proposal. Work includes observing or interviewing subjects, conducting experiments or surveys, writing reports and conclusions on results and conclusions, and presenting results and conclusions to others. Some positions in this class may oversee the work of research assistants or technicians. This class differs from the Physical Science Researcher/Scientist I on the Decision Making and Complexity factors, and possibly on the Purpose of Contact factor.

FACTORS

Allocation must be based on meeting all of the four factors as described below.

Decision Making -- The decisions regularly made are at the process level, as described here. Within limits set by professional standards, the agency's available technology and resources, and program objectives and regulations established by a higher management level, choices involve determining the process, including designing the set of operations. For example, in developing the plan for a research project, a position determines the set of experiments and methodologies to be used in collecting and

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analyzing the data. As another illustration, in testing compliance or studying the applicability of a theoretical model, a position determines the set of techniques and methodologies to be used in collecting and analyzing the data. The general pattern, program, or system exists but must be individualized. For example, the field of science, research program, program and cost guidelines, and funding system exist but must be adapted for the specific research plan or study. This individualization requires analysis of data that is complicated. Analysis is breaking the problem or case into parts, examining these parts, and reaching conclusions that result in processes. This examination requires the application of known and established theory, principles, conceptual models, professional standards, and precedents in order to determine their relationship to the problem. For example, when testing a new theory or researching to improve a theory, the position applies accepted scientific principles and analytical techniques in designing experiments and analyzing data; or, the position applies principles and analytical techniques in designing methods to adjust and weigh raw data and evaluate its reliability. New processes or objectives require approval of higher management or the agency with authority and accountability for the program or system.

Complexity -- The nature of, and need for, analysis and judgment is formulative, as described here. Positions evaluate the relevance and importance of theories, concepts, and principles in the particular physical science in order to tailor them to develop a different approach or tactical plan to fit specific circumstances. For example, a position tailors theory and techniques to determine what data should be explored or collected, the methods to collect it, and how to evaluate it for the specific study or test. While general policy, precedent, or non-specific practices exist, they are inadequate so they are relevant only through approximation or analogy. For example, positions search literature for similar research in order to draw analogies that can be used in modifying methods and protocols for the specific test or research. In conjunction with theories, concepts, and principles, positions use judgment and resourcefulness in tailoring the existing guidelines so they can be applied to particular circumstances and to deal with emergencies. For example, positions interpret program policies, standards, regulations, and existing models in relation to planning the specific methods and practices for a project.

Purpose of Contact -- Regular work contacts with others outside the supervisory chain, regardless of the method of communication, are for the purpose of any of the following:

Detecting, discovering, exposing information, problems, violations or failures by interviewing or investigating where the issues or results of the contact are not known ahead of time. For example, in interviewing research subjects during an experiment or study, positions persuade subjects to cooperate or resolve problems with the subject's understanding by interpreting and probing for information.

Securing regulatory compliance by issuing or revoking licenses and persuading or training others to correct problems. Regardless of the methods used to attempt to obtain compliance, the position can ultimately rely on legal authority to impose sanctions and penalties. For example, regardless of methods used to persuade others to comply, a position recommends enforcement actions against violators, such as warnings, fines, or citations.

Clarifying underlying rationale, intent, and motive by educating others on unfamiliar concepts and theories or marketing a product or service. This goes beyond what has been learned in training or repeating information that is available in another format. For example, positions teach courses and

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seminars, interpret results, or educate potential sponsors on the hypothesis and potential benefits of the research in order to obtain new funding.

Line/Staff Authority -- The direct field of influence the work of a position has on the organization is as an individual contributor. The individual contributor may explain work processes and train others. The individual contributor may serve as a resource or guide by advising others on how to use processes within a system or as a member of a collaborative problem-solving team. This level may include positions performing supervisory elements that do not fully meet the criteria for the next level in this factor.

PHYSICAL SCIENCE RESEARCHER/SCIENTIST III

I3B4**

CONCEPT OF CLASS

This class describes the work leader or staff authority. In addition to performing research/science as described before, positions in this level oversee the operation of a work unit with less than three full-time equivalent positions, including prioritizing work assignments and writing operating procedure manuals. Also included in this class is the position functioning as a pacesetter in a physical science which is evidenced by management's or peers' reliance on such a position for recommendations on policy and program direction that impacts the agency's mission. This class differs from the Physical Science Researcher/Scientist II on the Line/Staff Authority factor and possibly on the Purpose of Contact factor.

FACTORS

Allocation must be based on meeting all of the four factors as described below.

Decision Making -- The decisions regularly made are at the process level, as described here. Within limits set by professional standards, the agency's available technology and resources, and program objectives and regulations established by a higher management level, choices involve determining the process, including designing the set of operations. For example, in testing compliance or studying the applicability of a theoretical model, a position determines the set of techniques and methodologies to be used in collecting and analyzing the data. As another example, work leaders determine operating procedures and write manuals used by others in the work unit. The general pattern, program, or system exists but must be individualized. For example, the scientific and program guidelines exist but must be adapted for the specific research plan or study. This individualization requires analysis of data that is complicated. Analysis is breaking the problem or case into parts, examining these parts, and reaching conclusions that result in processes. This examination requires the application of known and established theory, principles, conceptual models, professional standards, and precedents in order to determine their relationship to the problem. For example, when testing a new theory or researching to improve a theory, the position applies accepted scientific principles and analytical techniques in designing experiments and analyzing data; or, the position applies principles and analytical techniques in designing methods to adjust and weigh raw data and evaluate its reliability. New processes or objectives require approval of higher management or the agency with authority and accountability for the program or system.

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Complexity -- The nature of, and need for, analysis and judgment is formulative, as described here. Positions evaluate the relevance and importance of theories, concepts, and principles in the particular physical science in order to tailor them to develop a different approach or tactical plan to fit specific circumstances. For example, a position tailors theory and techniques to determine what data should be explored or collected, the methods to collect it, and how to evaluate it for the specific study or test. While general policy, precedent, or non-specific practices exist, they are inadequate so they are relevant only through approximation or analogy. For example, positions search literature for similar research in order to draw analogies that can be used in modifying methods and protocols for the specific test or research. In conjunction with theories, concepts, and principles, positions use judgment and resourcefulness in tailoring the existing guidelines so they can be applied to particular circumstances and to deal with emergencies. For example, positions interpret program policies, standards, regulations, and existing models in relation to planning the specific methods and practices for a project.

Purpose of Contact -- Regular work contacts with others outside the supervisory chain, regardless of the method of communication, are for the purpose of any of the following:

Detecting, discovering, exposing information, problems, violations or failures by interviewing or investigating where the issues or results of the contact are not known ahead of time. For example, in interviewing research subjects during an experiment or study, positions persuade subjects to cooperate or resolve problems with the subject's understanding by interpreting and probing for information.

Securing regulatory compliance by issuing or revoking licenses and persuading or training others to correct problems. Regardless of the methods used to attempt to obtain compliance, the position can ultimately rely on legal authority to impose sanctions and penalties. For example, regardless of methods used to persuade others to comply, a position recommends enforcement actions against violators, such as warnings, fines, or citations.

Clarifying underlying rationale, intent, and motive by educating others on unfamiliar concepts and theories or marketing a product or service. This goes beyond what has been learned in training or repeating information that is available in another format. For example, positions teach courses and seminars, interpret results for others, or educate potential sponsors on the hypothesis and potential benefits of the research in order to obtain new funding.

Negotiating as an official representative of one party in order to obtain support or cooperation where there is no formal rule or law to fall back on in requiring such action or change from the other party. Such negotiation has fiscal or programmatic impact on an agency. In reaching settlements or compromises, the position does not have a rule or regulation to enforce but is accountable for the function. For example, as the agency's representative, positions are authorized to negotiate and approve contractual agreements with sponsors or negotiate with legislative committees to obtain funds. Such negotiations determine the type of projects and level of funding available for research.

Line/Staff Authority -- The direct field of influence the work of a position has on the organization is as a work leader or staff authority. The work leader is partially accountable for the work product of two or more full-time equivalent positions, including timeliness, correctness, and soundness. At least one of the subordinate positions must be in the same series or at a comparable conceptual level. Typical

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elements of direct control over other positions by a work leader include assigning tasks, monitoring progress and work flow, checking the product, scheduling work, and establishing work standards. The work leader provides input into supervisory decisions made at higher levels, including signing leave requests and approving work hours. This level may include positions performing supervisory elements that do not fully meet the criteria for the next level in this factor.

OR

The staff authority is a pacesetter who has a unique level of technical expertise in a field or profession that, as part of the assignment, is critical to the success of an agency. This authority directly influences management decisions at least on an agency-wide basis. For example, management relies on such a position when making decisions regarding the direction that policy and a program or system should take in the staff authority's field of expertise. Managers and peers recognize and seek this level of technical guidance and direction for development of an agency's system or regarding the application of a statewide system within the agency or to its clients.

PHYSICAL SCIENCE RESEARCHER/SCIENTIST IV

I3B5**

CONCEPT OF CLASS

This class describes the first supervisory level or senior authority. In addition to performing work as described before, positions in this level are accountable for the work of at least three full-time equivalent positions, including decisions affecting pay, status, or tenure. Also included in this class is the position functioning as a pacesetter in a physical science which is evidenced by management's or peers' reliance on such a position for recommendations on policy and program direction where the programs have impact beyond the agency's boundaries, including those programs under the control or influence of an agency that are administered by local governments. This class differs from the Physical Science Researcher/Scientist III on the Line/Staff Authority factor and possibly on the Complexity and Purpose of Contact factors.

FACTORS

Allocation must be based on meeting all of the four factors as described below.

Decision Making -- The decisions regularly made are at the process level, as described here. Within limits set by professional standards, the agency's available technology and resources, and program objectives and regulations established by a higher management level, choices involve determining the process, including designing the set of operations. For example, in testing compliance or studying the applicability of a theoretical model, a position determines the set of techniques and methodologies to be used in collecting and analyzing the data. As another example, supervisors determine operating procedures and write manuals used by others in the work unit. The general pattern, program, or system exists but must be individualized. For example, the scientific and program guidelines exist but must be adapted for the specific research plan or study. This individualization requires analysis of data that is complicated. Analysis is breaking the problem or case into parts, examining these parts, and reaching conclusions that result in processes. This examination requires the application of known and established

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theory, principles, conceptual models, professional standards, and precedents in order to determine their relationship to the problem. For example, when testing a new theory or researching to improve a theory, the position applies accepted scientific principles and analytical techniques in designing experiments and analyzing data; or, the position applies principles and analytical techniques in designing methods to adjust and weigh raw data and evaluate its reliability. New processes or objectives require approval of higher management or the agency with authority and accountability for the program or system.

Complexity -- The nature of, and need for, analysis and judgment is formulative, as described here. Positions evaluate the relevance and importance of theories, concepts, and principles in the particular physical science in order to tailor them to develop a different approach or tactical plan to fit specific circumstances. For example, a position tailors theory and techniques to determine what data should be collected, the methods to develop it, and how to evaluate and use it for the specific study or project. While general policy, precedent, or non-specific practices exist, they are inadequate so they are relevant only through approximation or analogy. For example, positions search literature for similar research in order to draw analogies that can be used in modifying methods and protocols for a specific test or research. In conjunction with theories, concepts, and principles, positions use judgment and resourcefulness in tailoring the existing guidelines so they can be applied to particular circumstances and to deal with emergencies. For example, positions interpret program policies, standards, and existing models in relation to planning the specific methods and practices for a project.

OR

The nature of, and need for, analysis and judgment is unprecedented, as described here. Positions originate models, concepts, and theories that are new to the professional field **AND** where no prototype exists in state government. For example, a position develops the models and measurements, that will be applied by other researchers and scientists in the field of science. At the leading edge, guidelines do not exist so judgment and resourcefulness are needed to develop them. For example, a position is conducting research designed to discover theory or law new to the state's programs and the science itself.

Purpose of Contact -- Regular work contacts with others outside the supervisory chain, regardless of the method of communication, are for the purpose of any of the following:

Detecting, discovering, exposing information, problems, violations or failures by interviewing or investigating where the issues or results of the contact are not known ahead of time. For example, in interviewing research subjects during an experiment or study, positions persuade subjects to cooperate or resolve problems with the subject's understanding by interpreting and probing for information.

Securing regulatory compliance by issuing or revoking licenses and persuading or training others to correct problems. Regardless of the methods used to attempt to obtain compliance, the position can ultimately rely on legal authority to impose sanctions and penalties. For example, regardless of methods used to persuade others to comply, a position recommends enforcement actions against violators, such as warnings, fines, or citations.

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Clarifying underlying rationale, intent, and motive by educating others on unfamiliar concepts and theories or marketing a product or service. This goes beyond what has been learned in training or repeating information that is available in another format. For example, positions teach courses and seminars, interpret research results, or educate potential sponsors on the hypothesis and potential benefits of the research in order to obtain new funding.

Negotiating as an official representative of one party in order to obtain support or cooperation where there is no formal rule or law to fall back on in requiring such action or change from the other party. Such negotiation has fiscal or programmatic impact on an agency. In reaching settlements or compromises, the position does not have a rule or regulation to enforce but is accountable for the function. For example, as the agency's representative, positions are authorized to negotiate and approve contractual agreements with sponsors or negotiate with sponsors or legislative committees to obtain funds. Such negotiations determine the type of projects and level of funding available for research.

Line/Staff Authority -- The direct field of influence the work of a position has on the organization is as a unit supervisor or senior authority. The unit supervisor is accountable, including signature authority, for actions and decisions that directly impact the pay, status, and tenure of three or more full-time equivalent positions. At least one of the subordinate positions must be in this class series or the at a comparable conceptual level. The elements of formal supervision must include providing documentation to support recommended corrective and disciplinary actions, signing performance plans and appraisals, and resolving informal grievances. Positions start the hiring process, interview applicants, and recommend hire, promotion, or transfer.

OR

The senior authority is a pacesetter who has a unique level of technical expertise in a field or profession that, as part of the assignment, is critical to the success of an agency. This authority directly influences management decisions beyond the agency. Managers and peers seek this level of technical guidance and direction as the designer of a statewide system or in a subject area for other areas of state government. Managers and peers, both internally and externally to the agency, rely on this pacesetter when making decisions regarding the direction policy, programs, and systems should take in the pacesetter's field of expertise.

PHYSICAL SCIENCE RESEARCHER/SCIENTIST V

I3B6**

CONCEPT OF CLASS

This class describes the manager of an agency's research or science program, who may also be a leading authority, or senior authority. In managing a program, positions in this level develop the goals and objectives of the program, allocate funds and staff among the various projects, evaluate the success of studies or projects, prioritize and approve study or testing proposals, and authorize expenditures. Also included in this class is the position functioning as a pacesetter in a physical science which is evidenced by management's or peers' reliance on such a position for recommendations on policy and program direction where the programs have impact beyond the agency's boundaries, including those programs under the control or influence of an agency that are administered by local governments. A position may

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also be a leading authority who functions as a pacesetter on a regional or national level. This class differs from the Physical Science Researcher/Scientist IV on the Decision Making factor and possibly the other factors.

FACTORS

Allocation must be based on meeting all of the four factors as described below.

Decision Making -- The decisions regularly made are at the interpretive level, as described here. Within limits of the strategic master plan and allocated human and fiscal resources, choices involve determining tactical plans to achieve the objectives established by the higher management (strategic) level. This involves establishing what processes will be done, developing the budget, and developing the staffing patterns and work units in order to deploy staff. For example, a position develops the multi-year study agenda for the program, develops the budget request for the program and approves expenditures, approves project plans and project priorities, and assigns allocated resources among the various projects. This level includes inventing and changing systems and guidelines that will be applied by others statewide. By nature, this is the first level where positions are not bound by processes and operations in their own programs as a framework for decision making and there are novel or unique situations that cause uncertainties that must be addressed at this level. Through deliberate analysis and experience with these unique situations, the manager or expert determines the systems, guidelines, and programs for the future. For example, in determining program goals and multi-year agendas, positions determine the focus or services of the program for the future.

Complexity -- The nature of, and need for, analysis and judgment is strategic, as described here. Positions develop guidelines to implement a program that maintains the agency's mission. For example, positions develop fiscal and staffing management plans, operational policies, program goals and agendas, and project evaluation standards needed to operate an agency's research/science program. Guidelines do not exist for most situations. For example, the only parameters are program policy and mission, regulatory standards or potential sponsors, and allocated resources. In directive situations, positions use judgment and resourcefulness to interpret circumstances in a variety of situations and establish guidelines that direct how a departmental/agency program will be implemented. For example, positions develop operational policies for the agency's work in a specific science, such as policies on informed consent, confidentiality, and sharing of data.

OR

The nature of, and the need for, analysis and judgment is unprecedented, as described here. Positions originate models, concepts, and theories that are new to the professional field **AND** where no prototype exists in state government. For example, a position develops the models and measurements, that will be applied by other researchers and scientists in the field of science. At the leading edge, guidelines do not exist so judgment and resourcefulness are needed to develop them. For example, a position is conducting research designed to discover theory or law new to the state's programs and the science itself.

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Purpose of Contact -- Regular work contacts with others outside the supervisory chain, regardless of the method of communication, are for the purpose of any of the following:

Clarifying underlying rationale, intent, and motive by educating others on unfamiliar concepts and theories or marketing a product or service. This goes beyond what has been learned in training or repeating information that is available in another format. For example, positions teach courses and seminars, interpret research results, or educate potential sponsors on the hypothesis and potential benefits of the research in order to obtain new funding.

Negotiating as an official representative of one party in order to obtain support or cooperation where there is no formal rule or law to fall back on in requiring such action or change from the other party. Such negotiation has fiscal or programmatic impact on an agency. In reaching settlements or compromises, the position does not have a rule or regulation to enforce but is accountable for the function. For example, as the agency's representative, positions are authorized to negotiate and approve contractual agreements with sponsors or negotiate with sponsors or legislative committees to obtain funds. Such negotiations determine the type of projects and level of funding available for research.

Defending, arguing, or justifying an agency's position in formal hearings or court where the position is an official representative of one party. For example, on behalf of an agency, a position defends or justifies the purpose and results of research during regulatory board or commission hearings or legislative hearings in order to influence these decision makers to adopt or change policies and programs in favor of the study results.

Line/Staff Authority -- The direct field of influence the work of a position has on the organization is as a program supervisor (unit supervisor), manager, senior authority, or leading authority. The program supervisor is accountable, including signature authority, for actions and decisions that directly impact the pay, status, and tenure of three or more full-time equivalent positions. At least one of the subordinate positions must be in this class series or at a comparable conceptual level. The elements of formal supervision must include providing documentation to support recommended corrective and disciplinary actions, signing performance plans and appraisals, and resolving informal grievances. Positions start the hiring process, interview applicants, and recommend hire, promotion, or transfer.

OR

The manager must be accountable for multiple units through the direct supervision of at least two subordinate Unit Supervisors; and, have signature authority for actions and decisions that directly impact pay, status, and tenure. Elements of formal supervision must include providing documentation to support recommended corrective and disciplinary actions, second-level signature on performance plans and appraisals, and resolving informal grievances. Positions start the hiring process, interview applicants, and recommend hire, promotion, or transfer.

OR

The senior authority is a pacesetter who has a unique level of technical expertise in a field or profession that, as part of the assignment, is critical to the success of an agency. This authority directly influences

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management decisions beyond the agency. Managers and peers seek this level of technical guidance and direction as the designer of a statewide system or in a subject area for other areas of state government. Managers and peers, both internally and externally to the agency, rely on this pacesetter when making decisions regarding the direction policy, programs, and systems should take in the pacesetter's field of expertise.

OR

The leading authority is a pacesetter who has a rare level of technical expertise in a field or profession that, as part of the assignment, is critical to the success of an agency. This authority directly influences management decisions and peers in the profession outside of state government. Managers and peers throughout the nation recognize and seek this level of technical guidance and direction because of the recognized expertise in a subject area. For example, program managers and colleagues in other states rely on the regional or national pacesetter when making decisions regarding the direction of their policy, programs, and systems in the pacesetter's field. This reliance on, and delegation of, primary responsibility for influencing management direction, including representing the state regionally or nationally, separates this level of staff authority from all others.

DEFINITIONS

Cartography: the application of mapping, surveying, and photogrammetry fields to studies or analyses of other scientific or program data such as economic, demographic, or statistical data.

Chemistry & Related: the scientific application of the theories, principles, or models of the physical and chemical properties and compositional changes of substances; specialization may occur in one or more branches such as organic, inorganic, or bio-chemistry. This specialty may include work related to biological chemistry of identifying and the analytical testing of substances, cells, tissues, allergens, antibodies, or compounds related to living organisms.

Geology: the application of knowledge of chemistry, physics, biology, and mathematics to explain phenomenon related to the composition, structure, or history of the earth's crust in support of mining, exploration, construction, or environmental impact. Geology is the science which treats of the earth, the rocks of which it is composed, and the changes which it has undergone or is undergoing.

Hydrology: the application of the theories, principles, and models of water resource engineering, hydraulics, and hydrology with state and federal laws or state water rights, policies and programs. This specialty area includes work assignments related to the planning, developing, implementation, administration and evaluation of the economic, legal, political and environmental aspects of water supply, usage, control and/or protection.

Industrial Hygiene: the application of chemistry, biology, or occupational health sciences to recognize, analyze, eliminate, or control health hazards or diseases associated with dust, gases, radiation, noises, or toxic materials or substances.

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Meteorology: the application of the knowledge of climatology and atmospheric phenomena to providing public services in this area.

Other science: any other physical science not defined by one of the specialty areas above.

Physical Science: those sciences related to physical, non-living matter or energy, such as chemistry, physics, geology, meteorology, astronomy, and mathematics.

ENTRANCE REQUIREMENTS

Minimum entry requirements and general competencies for classes in this series are contained in the State of Colorado Department of Personnel & Administration web site.

For purposes of the Americans with Disabilities Act, the essential functions of specific positions are identified in the position description questionnaires and job analyses.

CLASS SERIES HISTORY

Effective 7/1/08 (TMM). PSE System Maintenance Study. No changes. Published as proposed 7/31/07.

Effective 7/1/02 (DLF). PSE System Maintenance Study. Definition of Hydrology changed. Published as proposed 5/15/02.

Effective 9/1/93 (DLF). Job Evaluation System Revision project. Published as proposed 5/28/93.

Revised 1/1/92. Changed Occupational Group to PSE, Principal Water Resource Specialist (A3156).

Revised 10/1/86. Changed nature of work, Supervisor, Genetic Screening Lab (A5548); changed class codes and entrance requirements, Microbiologist (A5543-54).

Revised 7/1/85. Changed class codes, options, nature of work, and entrance requirements, Chemist A - Chief Chemist (A5901-05).

Revised 7/1/83. Changed pay grades and relationship, Geologist B/C (A3502-03).

Revised 7/1/81. Changed relationship, Principal Water Resource Specialist (A3156).

Created 7/1/80. Cartographer A - Senior (A0040-43), Supervisor, Genetic Screening Lab (A5548), Senior Chemist (A5906).

Revised 1/1/79. Changed nature of work and entrance requirements, Senior Geologist (A3504).

Created 10/1/78. Senior Microbiologist (A5554).

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PHYSICAL SCIENCE RESEARCHER/SCIENTIST
July 1, 2008

Created 1/1/75. Water Resource Specialist A - Principal Water Resource Specialist (A3150-56), Industrial Hygienist A - Supv Industrial Hygienist (A3414-19), Geologist A - Supervising Geologist (A3501-06), Microbiologist A-C, Supervising, Chief (A5543-47, 49, 50), Public Health Lab Licensing Specialist (A5551), Chemist A - Chief Chemist (A5901-05).

SUMMARY OF FACTOR RATINGS

Class Level	Decision Making	Complexity	Purpose of Contact	Line/Staff Authority
Physical Science Res/Sci Intern	na	na	na	na
Physical Science Res/Sci I	Operational	Patterned	Exchange or Detect	Indiv. Contributor
Physical Science Res/Sci II	Process	Formulative	Detect, Secure, or Clarify	Indiv. Contributor
Physical Science Res/Sci III	Process	Formulative	Detect, Secure, Clarify, or Negotiate	Work Leader or Staff Authority
Physical Science Res/Sci IV	Process	Formulative or Unprecedented	Detect, Secure, Clarify, or Negotiate	Unit Supervisor or Senior Authority
Physical Science Res/Sci V	Interpretive	Strategic or Unprecedented	Clarify, Negotiate, or Defend	Unit Supervisor, Manager, Senior Authority, or Leading Authority

ISSUING AUTHORITY: Colorado Department of Personnel & Administration