Summary of Discussions with Focus Groups from the Scientific Occupational Group

Overview of Findings

In the scientific occupational group, both the technician and scientist roles have multiple disciplines. In each discipline, the complexity levels of the work assignments and decision making are different depending on the agency's usage of the class series and its organizational structure. In one agency an employee may be classified at the lowest level in a class series, while an employee in same class series in another agency who has the same level of complexity in their work will be classified in a higher level of the series. In addition, one agency may use all levels of the class series to incorporate their agencies hierarchy of reporting, while another agency uses the same class series as a career ladder for learning from entry to full-performance and beyond. Inadvertently, then, it appears that some agencies create career ladders or structures that don't properly reflect the work that is being performed or don't reflect the training and experience that their own employees possess. In those agencies, skilled technicians and scientists can find themselves held back within an agency despite their recognized expertise, and the employees indicated that there is an increasing tendency for those employees to leave the agency to find other jobs where their skills and capabilities are valued as much or more than the diplomas or degrees they hold. In other agencies, employees stay because they like the work that they are doing and higher level classifications or increased compensation levels are not a priority over the enjoyment and satisfaction from the work one does.

Distinction Between Scientists and Technicians

Technicians are specialists with training and experience suited to carrying out the structured work in the field and the lab, and require expert knowledge in particular tasks, such as testing, sampling, inspection, servicing and some level of analysis. Generally, their most important job skill is to follow instructions carefully and consistently in accordance with relevant rules and procedures. Technicians often become the recognized expert in a certain processes, and may have to obtain certification in these processes. Often, other technicians and entry level scientists learn from the experienced technician, at least when it comes to the "how to" type questions (the "why" questions are reserved for the more advanced scientist to answer).

In addition, partially due to the lack of eligible candidates graduating from college with degrees in the sciences, participants stated that it has become much more difficult to hire scientists with degrees. Therefore, in some instances, more work has been placed on the advanced technicians to take on more and more of the analytical duties that once were seen being performed by entry level scientists, making it more difficult in some situations to distinguish the work of advanced technicians from that of an entry level scientist. To emphasize this issue even more, technicians' work in some specialties is becoming more specialized and technical. Therefore, technicians are now seen in these specialties as technologist due to their acquiring of additional certification or education to perform the work in these specialties. Again, this makes it more difficult to distinguish the levels of work between technician and scientist roles. Participants indicated that in some instances, experienced technicians occasionally move into some of the roles filled by scientist as their experience grows.

The work of scientists requires more academic preparation with particular emphasis on the application of scientific theory and principles that comes from college level coursework. In almost all situations, a scientist will have at least a college degree with coursework, if not a major, in their chosen field. The participants indicated that many of their colleagues also have advanced degrees. This advanced knowledge and skills allows scientists to work independently in design, problem solving, data interpretation, complex troubleshooting, and preparation of specifications and papers, as well as testifying in courts-of-law as expert witnesses. The participants all stressed the need for continual learning, and in some scientific fields this is confirmed by possession of professional licenses or certification. Many scientists may move into more advanced levels of the scientific field as their careers progress. Advanced levels of scientists deal with more complex issues. This can sometimes be seen as a focus on the legal compliance and policy issues related to the specialized area of the scientist, and also through the performance of the work as supervisors or team leaders of projects having greater regional or statewide impact.

Minimum Qualifications

The majority of the participants agreed that the current minimum qualifications were sufficient. Some of the reoccurring comments from the participants are as follows:

Technicians –

- Some experience in a laboratory or experience or coursework would be helpful.
- Most of the work is learned on the job.
- Would like to be able to move to a Scientist position based on years of experience with no degree.

Scientists –

- If the candidate does not have a major in the specific scientific discipline (biology, chemistry, etc.), specific course work in those areas are preferable.
- The substitution of experience for a degree is not effective.
- Most of the work is learned on the job.
- Appears to be an overall lack of candidates in the entry level scientist positions, with the exception of positions in Wildlife and Parks.

Full Performance

Amount of Time to Reach Full Performance

For Technicians, participants indicated that it takes anywhere from six months to reach full performance as an entry-level Technician to between one and three years to be capable of full performance work as a higher level Technician. The distinction between an entry-level and full performance Technician is primarily based on the employee's aptitude with a range of processes and procedures, as well as the level of independence in the performance of the employee's duties.

In almost all cases, the time increments mentioned above reflect the experience acquired through on the job training. However, some Technician positions are required to complete specific certification or training requirements before being able to complete full-performance work. For

example, some positions with KDHE are required to complete training provided by the EPA while some positions with the KBI are required to complete training from the FBI on fingerprinting.

For Scientists, in general participants indicated that it takes anywhere from six months to a year to reach full performance as an entry-level Scientists and between two to five years to be capable of full performance as a higher level Scientist. The distinction between an entry-level and full performance Scientist is primarily based on the complexity/specialization of the work being performed as well as the level of independence in the performance of the employee's duties. Again, as with Technicians, the participants indicated that this time reflects the experience acquired through on the job training and actual performance of the duties.

In some instances, particularly with Geologists, the time periods are more defined due to specific testing and licensure requirements of that discipline. Some participants also indicated that this length of time can be dependent on cyclical or seasonal issues, depending on the particular discipline. Finally, some Scientist positions are required to complete specific certification or training requirements before being able to complete full-performance work. For example, some positions with the Department of Wildlife and Parks are required to complete training provided by the USDA and some positions are even required to complete law enforcement training. However, in general, the amount of time that is required to reach full performance is generally dependent on the employee's ability.

Advanced Full Performance Level: In the scientific occupation group, both for Technicians and Scientists, there seems there is not a clearly defined level of work that is higher in complexity and responsibilities than an employee who is seen as performing independently at full performance. The next higher role is generally seen as a supervisor or manager.

There are some work areas where a person or persons are identified as a lead worker due to their advanced expert knowledge on procedures and operations or due to their expertise in a particular specialty or sub-discipline. The Forensic Scientist III level was the example of this situation most often cited during the focus groups.

Type of Supervision Received

Technicians generally receive limited supervision and the work usually does not require the use of independent judgment or discretion. While supervision is limited, employees generally do not have authority to make independent decisions outside of standard operating procedures or guidelines. As one becomes advanced or seen as a expert in their processes, employees are given more independent judgment to act on their own discretion requiring the use of technical knowledge to resolve complex problems. Supervision exists to provide general direction, review judgments made by employees, and clarify standards, policies and procedures that are normally seen as the day-to-day work activities of a supervisor. Additional, specific instructions are given for new, difficult, or unusual assignments.

Scientists generally receive limited supervision and the work requires employees to use independent judgment or act on their own discretion, requiring the use of initiative and creativity to resolve problems or interpret policy to develop solutions. As employees progress to higher

levels of positions, direction becomes more general and employees have greater and greater independence and accountability. Major work assignments are examined for soundness or technical judgment and for general effectiveness and adequacy. At the advanced level, employees have a broad and comprehensive knowledge of theories, concepts and practices with the ability to apply those skills to complex, difficult and/or unprecedented situations. Supervision exists to provide administrative direction in the planning, organizing and implementation of the work activities, as well as to oversee the budget responsibilities, respond to legislative and media inquiries and complaints, and to see to human resource issues. In general, the supervisors and managers handle the more potentially controversial matters, or far-reaching implications, and other administrative/managerial types of problems.

Supervisory/Management Approval
Given the great deal of independence afforded full performance Technicians and Scientists with respect to making decisions regarding the scope of their work, the only issues that the participants indicated were necessary to obtain approval from their supervisors for were the following: Budget (mostly spending over $5,000 – major supplies of over $1,000); matters of enforcement (fines, penalties, etc.); legal determinations; personnel matters such as hiring and disciplinary issues; procedural changes; and anything that is contrary to mission or path of the agency.

What Criteria Should Compensation be Based? There seemed to be a consensus that performance and other personal characteristics that the employee brings to the job (such as initiative, ability to work well with others, etc.) should be one of, if not the primary criteria for the basis of compensation for both Technician and Scientist positions. The participants indicated that this would be an especially important criteria during the period of time when a new employee is working toward the full performance level. There was also consensus that, due to the importance of experience and on-the job training, longevity was also an important criteria on which employees' pay should be based, especially after the point when an employee becomes capable of full performance of his or her job duties. Longevity coincides with an employee's continued career growth and additional responsibilities. Pay for an employees' certification, licensure or completion of specific training, where such accomplishments enhance the employee's ability to perform the duties of their position or allow the employee to perform additional duties associated with their position, was also agreed to be something that would be a benefit to positions in the Scientific Occupational Group.

While performance and other personal characteristics were thought to be the most important criteria on which pay should be based, the participants expressed concern with the ability to fairly administer a system that bases pay on those qualities. The primary concern was favoritism. However, the participants thought that a system based exclusively on longevity with all employees receiving the same amount of increase, regardless of effort or job performance, would not work well, and could serve as a disincentive to exceptional work.

In addition, the participants indicated that they were all in favor of a system that would allow an employee to progress in pay as they progressed in their career. Employees in those classes that have a career ladder expressed their appreciation of the system of progression, while those

employees in agencies that do not have automatic progression expressed frustration for having to wait for a “slot” to open before they could receive an increase in pay.

Occupational Survey Summary on the Scientific Field
Participation Rate: 93%

SUMMARY BY ROLES

	Technicians	Scientists
Participation Rate:	20% of the 93% Whole	80% of the 93% Whole
Time Worked in Occupation:	Approximately 80% of the employees in this field have over 1 year or more work experience; 55% have five or more years; and 33% have ten or more years.	Approximately 84% of the employees in this field have over 1 year or more work experience; 51% have five or more years; and 32% have ten or more years
Education, Training and Experience:	Most positions at entry will require high school and less than a bachelor's degree and additional 6 months to a year on-the-job training to become fully proficient. Many require extensive skill, knowledge, and experience requiring over 2 years, up to and including 4 years.	Most positions at entry will require a bachelor's degree and additional year or more on-the-job training to become fully proficient. Many require extensive skill, knowledge, and experience requiring over 2 years, up to and including 4 years
Knowledge: **(Extremely or Very Important)**	1. Law and Government	1. Biology 2. Geology/Hydrogeology 3. Chemistry
Skills: **(Extremely or Very Important)**	1. Reading Comprehension 2. Active Listening 3. Speaking 4. Writing 5. Time Management	1. Reading Comprehension 2. Critical Thinking 3. Writing 4. Speaking 5. Science
Behavioral: **(Core)**	1. Achievement Orientation 2. Building Relationships 3. Communication 4. Problem Resolution	1. Achievement Orientation 2. Building Relationships 3. Communication 4. Problem Resolution
Work Context: (Every Day)	1. Contact with Others 2. Face to face Discussions 3. Decisions affect other people 4. Work in teams 5. Interaction with external customer/public 6. Writes letters and memos	1. Contact with Others 2. Face to face Discussions 3. Decisions affect other people 4. Interaction with external customer/public 5. Work in teams 6. Writes letters and memos

Level of Complexity: (Level 4 or Higher)	57% - Level 4 -You evaluate the relevance and importance of theories, concepts, and principles. You develop different approaches or tactical plans to fit specific circumstances. Guidelines may, exist, but are flexible and open to considerable interpretation. Independent judgment, personal direction, and resourcefulness are needed to interpret and apply guidelines	1. 41.9% - Level 4 -You evaluate the relevance and importance of theories, concepts, and principles. You develop different approaches or tactical plans to fit specific circumstances. Guidelines may, exist, but are flexible and open to considerable interpretation. Independent judgment, personal direction, and resourcefulness are needed to interpret and apply guidelines. 2. 37.4% Level 5 + – Work involves the development of new guidelines and techniques, establishing criteria or developing new information. Guidelines may not exist for all situations. Considerable independent judgment, personal discretion, and interpret circumstances, and to make decisions in major areas where there may be uncertainty in approach, methodology, and interpretation.
Supervision Received/Independence: (Level 4 or Higher)	63.9% - Level 4 - Receive limited supervision and the work requires employees to use independent judgment or act on their own discretion. Requires the use of initiative and creativity to resolve problems or interpret policy to develop solutions. A manager may be available to provide general direction or advice, but employees usually act	1. 46.7% Level 4 - Receive limited supervision and the work requires employees to use independent judgment or act on their own discretion. Requires the use of initiative and creativity to resolve problems or interpret policy to develop solutions. A manager may be available to provide general direction or

	independently based on their own judgment.	advice, but employees usually act independently based on their own judgment. 2. 38.2% Level 5 + – Receive general direction, working from broad goals and policies, Desired results are communicated to the employee and alternative methods may be suggested but are not explicitly prescribed. Major work assignments are examined for soundness or technical judgment and for general effectiveness and adequacy.
Supervision Given:	75.3% - Majority of positions have no supervisory responsibilities	Positions do not supervise **or** perform essentially the same work, and the supervision is seen more as technical leadership.
Knowledge within the Field or Specialty:	73.2% - Majority of positions require at a minimum an in-depth knowledge of concepts, practices and procedures with ability to use in varied situations.	52.2% of the positions require at a minimum an in-depth knowledge of concepts, practices and procedures with ability to use in varied situations; and 39.9% of the positions require broad and comprehensive knowledge of theories, concepts and practices with ability to use in complex, difficult and/or unprecedented situations.

Decision Making:	1. 42.7% - Decisions may affect a work unit or area within a department/division. May contribute to business and operational decisions that affect the department/ division. 2. 25%- Decisions have major implications on the management and operations of an area within a department/division. Job may contribute to important strategy, operational and business decisions that affect the department/division.	1. 52.2% - Decisions have major implications on the management and operations of an area within a department/division. Job may contribute to important strategy, operational and business decisions that affect the department/division. 2. 36.1% - Decisions may affect a work unit or area within a department/ division. May contribute to business and operational decisions that affect the department/division.
Problem Solving:	1. 57.7% - Problems are varied, requiring analysis or interpretation of the situation. Problems are solved using knowledge and skills, general precedents and practices. 2. 28.9% - Problems are highly varied, complex and often non-recurring, requiring novel and creative approaches to resolution. New concepts and approaches may have to be developed.	1. 47.1% - Problems are varied, requiring analysis or interpretation of the situation. Problems are solved using knowledge and skills, general precedents and practices. 2. 37.2% - Problems are highly varied, complex and often non-recurring, requiring novel and creative approaches to resolution. New concepts and approaches may have to be developed.
Fiscal Responsibility:	Only 20% of the positions require assisting in planning, monitoring and/or managing budget in functional area of a program.	Only 37.9% of the positions require assisting in planning, monitoring and/or managing budget in functional area of a program.
Licenses/Certifications:	Only 14% of position requires a licenses or certification.	Only 24.2 % of position requires a licenses or certification.