STANDARD PRACTICE INSTRUCTION

DATE: June 7, 2011

SUBJECT: Occupational Exposure to Lead

REGULATORY STATUTE: OSHA - 29 CFR 1910.1025

BASIS: Millions of American workers are at risk of developing cancer and other serious illnesses due to their exposure to lead materials in the workplace. In recent years there has been a significant increase in the number of cases reported. This poses a serious problem for exposed workers and their employer. This standard practice instruction establishes uniform requirements to ensure that procedures to limit the spread of such hazards are implemented, evaluated, and that the proper hazard information is transmitted to all affected workers.

GENERAL: Connecticut College will ensure that all potential lead exposure hazards within our facility(s) are evaluated and controlled. This standard practice instruction is intended to address comprehensively the issues of; evaluating and identifying potential sources of lead exposure, evaluating engineering controls, work practices, administrative controls, medical management, training, and establishing appropriate procedures.

RESPONSIBILITY: The Director of Environmental Health and Safety (EH&S) is responsible for all facets of this program, and has full authority to make necessary decisions to ensure success of the program. The Director of EH&S is the sole person authorized to amend these instructions, and is authorized to halt any operation where there is danger of serious personal injury.

Contents of the Connecticut College Lead Safety Program

The Connecticut College Lead Safety Program

1. **Written program.** Connecticut College will review and evaluate this standard practice instruction at least once every six months, or when changes occur that prompt revision of this document, or when facility operational changes occur that require a revision of this document, or should the procedures ever fail. This written program will be communicated to all personnel. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

   1.1. Working with the Director of EH&S, supervisors will develop and maintain the following for each job where lead is emitted.

   - A description of each job.
   - A list of machinery or tools that are used in the job.
   - Source of exposure.
   - Exposure controls that are in place.
   - Employee job responsibilities.
   - Operating procedures specific to the job.
   - Maintenance practices specific to the job.
   - Any administrative controls used as a means of reducing employees exposure to lead. (e.g., a job rotation schedule)

2. **General requirements**. OSHA guidelines require that each employer who has employee(s) with potential occupational exposure to lead, prepare an exposure determination. This exposure determination shall contain the following:

   - A list of job classifications for all employees whose job classifications have potential occupational exposure to lead.
   - A list of all tasks and procedures, or groups of closely related tasks and procedures in which occupational exposure occurs, and that are performed by employees in job classifications listed in accordance with the provisions of the this standard practice instruction.
   - The schedule and method of implementation, methods of compliance, Communication of Hazards and record keeping required by 29 CFR 1910.1025.
   - The procedure for the evaluation of circumstances surrounding incidents.
   - Methods of compliance.

3. **Job Classification and Exposure Control.**

   3.1. Job classifications in which employees have the potential for occupational exposure to lead at Connecticut College.

   - Plumbers

- Painters
- Carpenters

4. Training.

4.1. Initial Training. Prior to job assignment, this employer shall provide training to ensure that the hazards associated with lead are understood by employees and that the knowledge, skills and personal protective equipment required are acquired by employees. The training shall as a minimum include the following:

- Recognition of applicable hazards involved with a particular job, and the methods and means necessary for safe lead work.
- The contents of 29 CFR 1910.1025 and appendices.
- The specific nature of work processes that could result in exposure to lead above the action level.
- The purpose, proper selection, fitting, use and limitations of respirators.
- The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproduction effects on both males and females).
- The engineering controls and work practices associated with the employee's job assignment, including training of employees to follow relevant good work practices.
- Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.
- A copy of 29 CFR 1910.1025 and all other pertinent information shall be readily available to all affected employees upon request.
- The employee's right of access to records under 29 CFR 1910.20.
- The contents of this compliance plan.

4.2. Refresher Training. Scheduled refresher training will be conducted on a(n) annual basis. Retraining shall also be conducted for all authorized and affected employees whenever there is:

- A change in their job assignments
- A change in personal protective equipment, equipment or processes that present a new hazard
- A change in the lead safety procedures.

Retraining will also be provided whenever a safety procedure fails, resulting in a near-miss, illness, or injury, or whenever a periodic inspection reveals, or whenever this employer has reason to believe, that there are deviations from or inadequacies in the employee's knowledge of known hazards, or use of equipment or procedures. The

retraining shall reestablish employee proficiency and introduce new equipment, or revised control methods and procedures, as necessary.

4.3. Renovation, Repair and Painting Rule (RRP) Training. In 2010, the U.S. Environmental Protection Agency (EPA), in collaboration with the U.S. Department of Housing and Urban Development (HUD), implemented the "Renovation, Repair and Painting Rule", which required training for workers who perform renovation, repair, and painting work in housing with lead-based paint. Although OSHA lead safety procedures still apply, the rule provides specific precautions intended to prevent the spread of lead paint dust in housing or other buildings (schools, daycare centers, etc.) occupied by children under the age of six.

Connecticut College employees who conduct renovation, repair or painting work in College owned housing will be RRP trained and certified by an EPA approved course, and receive annual refresher training.

Contractors hired to perform renovation, repair or painting work must also show proof of RRP certification, and be properly supervised. Specific requirements are detailed in the Connecticut College RRP Policy.

5. Work Operations.

5.1. Work operations at Connecticut College where occupational exposure to lead are limited:

- Plumbers – Having been established in 1911, Connecticut College has buildings that contain lead joints, in some waste plumbing. On occasion, those leaded connections fail, and need to be replaced. Work procedures include _____.
- Carpenters – Employees of the Carpenter Shop are exposed during repairs to older buildings, with window glazing or paint that contains lead. (Note: Older window glazing or building caulk may also contain asbestos or PCB's.) Work procedures include_____.
- Painters are required to prepare the surface before re-painting, and may present an exposure hazard during scraping or stripping procedures. Specific work procedures include _____.

5.2. Responsibilities:

- Building Trades Supervisor:
  - Supervises the safe performance of work in accordance with this and other work practices, and 29 CFR 1910.1025.
  - Ensures that the initial determination for potential lead or toxic exposure has been accomplished <u>before</u> work begins.
  - Assigns jobs only to qualified employees.

- Employee:
  - Uses the protective and safety equipment as assigned and directed.
  - Abides by the requirements of this work practice.
  - Participates in the biological monitoring.
  -
- Director of Environmental Health & Safety:
  - Coordinates the requirements of this program in accordance with the requirements of 29 CFR 1910.1025.

6. Medical Surveillance.

6.1. The medical surveillance provisions of this standard practice instruction are intended to provide our employees with a comprehensive approach to prevention of lead-related disease. The primary purpose is to supplement the OSHA standard's primary mechanisms of disease and illness prevention, the elimination or reduction of airborne concentrations of lead and sources of ingestion, by facilitating the early detection of medical effects associated with exposure to lead.

All medical examinations and procedures will be performed by or under the supervision of a licensed physician and are to be provided without cost to employees at a reasonable time and place.

6.2. Two phases of surveillance. The medical surveillance provisions contemplate two phases of medical surveillance: The initial medical examination, then an ongoing medical surveillance program.

- Initial medical surveillance consists of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin (ZPP) levels. It will be provided to our employees occupationally exposed to airborne concentrations of lead on any one day at or above the action level as well as to employees performing high exposure "trigger tasks" during initial exposure assessment.

- Action level medical surveillance. If an employee's airborne lead exposure is at or above the action level (30 ug/m3, TWA) for more than 30 days a year, and whose Blood Lead Level (BLL) exceeds 40 ug/dl, this employer shall provide a medical surveillance program to the employee consisting of routine monitoring of an employee's blood lead and ZPP levels. If routine and follow-up blood tests for blood lead exceed the removal criteria of 50 ug/dl, then the employee will be removed from exposure to airborne lead that exceeds the action level. Employees will be notified in writing of their blood lead levels within five working days after the receipt of biological monitoring results.

6.3. Surveillance initiation. Connecticut College will provide a full medical surveillance program to any employee, including annual medical exams, when it is determined that the employee's blood lead level exceeds 40 ug/dl, or if the employee's airborne exposure is, or may be at or above the action level for more than 30 days a year

6.4. Examination criteria. The content and frequency will be at the discretion of the attending physician. Upon request of an employee, a pregnancy test or male fertility test will be provided. Each examination as a minimum will include:

- A work and medical history
- A physical examination
- A blood pressure measurement
- Determinations of blood lead level (PbB)
- Hematocrit, hemoglobin, peripheral smear morphology and, red cell indices
- Levels of zinc protoporphyrin (ZPP)
- Routine urinalysis (specific gravity, sugar, protein determinations, and microscopic examination), blood urea nitrogen (BUN), and serum creatinine (S-Creat).

6.5. Medical consultations. Medical consultations will be provided upon notification by an employee under the following conditions:

- The employee has developed symptoms commonly associated with lead-related disease.
- The employee desires advice concerning the effects of lead on reproductive capacity, or is pregnant.
- The employee has demonstrated difficulty in breathing during fit testing or use of a respirator.

6.6. Multiple physician review. To meet the requirements of the standard, Connecticut College will ensure the surveillance program contains a multiple physician review mechanism, which provides workers an opportunity to obtain a second and possibly third opinion regarding the medical determinations made. An employee may designate a second physician to review any findings, determinations or recommendations of an initial physician chosen by the College. Should the two physicians be unable to agree, a third physician, jointly selected, will resolve the disagreement. It is expected that the third physician will consult with the two prior physicians. Upon request, the College will supply the same information to the third physician given to the initial physicians. The cost of any multiple physician review will be borne by the College.

6.7. Medical Removal Protection. The College will remove an employee from work involving exposure to lead under the following conditions:

- Action level exceedance. When it is suspected from any source that an employee has reached an exposure level at or above the action level.
- Periodic and/or follow-up tests. On each occasion that a periodic and a follow-up blood sampling test indicate that the employee's blood lead level is at or above 50 ug/dl.
- Medical determination. On each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

6.8. Return to work.

- An employee removed from exposure to lead at or above the action level due to a blood lead level at or above 50 ug/dl, may be returned to full duty, when two consecutive blood sampling tests indicate that the blood level is at or below 40 ug/dl, so long as no other restrictions are present.
- An employee removed from exposure to lead due to a final medical determination will be returned to work when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment of health from exposure to lead.

7. Selection and use of safe work practices. Supervisors shall develop and ensure use of standardized safety-related work practices to reduce and prevent illnesses and injuries resulting from exposure to lead. The specific safety-related work practices shall be consistent with the nature and extent of the associated hazards.

7.1. Work procedures and the specific means and technology to protect employees and to achieve compliance with the occupational exposure to lead program include:

- Basis of initial determination. An initial determination shall be made to ascertain the potential exposure to lead before any work in undertaken. The basis of the initial determination shall include, but not be limited to, the following:
  - Past history and record of similar or like work operations that could indicate employee exposure to lead.
  - Previous measurements and records of airborne lead and analytical findings, observations, calculations or other information.
  - Analysis of paint or other materials involved in the specific work operation.
  - Employee complaints of symptoms that may be attributable to

exposure to lead.

- Monitoring for initial determination of exposure. As a minimum, the College will monitor a representative sample of employees, who it is believed are exposed to the greatest airborne concentrations of lead.
- Previous Data. Where measurements of airborne lead have been obtained in the preceding 12 months, this data may be used to fulfill initial monitoring requirements if it is representative and is accurate to a confidence level of 95%.
- Positive Initial Determination and Initial Monitoring - when the initial determination shows that the possibility of employee lead exposure exists at or above the action level the following shall be adhered to:
    - Engineering controls and work practices shall be implemented. These include, but are not limited to, increased ventilation, enclosures or removing work to another location.
    - Respirators shall be used whenever engineering and work practice controls are <u>not</u> sufficient to reduce exposure to or below the permissible exposure limit.
    - Respirators shall be provided whenever an employee requests a respirator.
    - Respirators shall be used in accordance with the supervisor's instructions and the College's Respiratory Protection Program.

7.2. Negative Initial Determination - when a determination is made that no employee is exposed to airborne lead at or above the action level, this information will be documented. The documentation shall include at least the following:

- Date of determination.
- Location of determination.
- Name and social security number of each employee monitored.
- Records of past history and record of similar or like work operations, which would indicate employee exposure to lead.
- Records of previous measurements and records of airborne lead and analytical findings, observations, calculations or other information.
- Records of analysis of paint or other materials involved in the specific work operation.
- Records of employee complaints of symptoms which may be attributable to exposure to lead.

7.3. Frequency of Monitoring - If the initial determination (representatively sampled for at least seven continuous hours for each shift) reveals employee exposure below the action level, the monitoring need not be repeated.

If the initial determination reveals employee exposure to be at or above the action level, but below the permissible exposure limit, monitoring shall be repeated at least every 6 months. The monitoring shall continue until at least two consecutive measurements, taken at least 7 days apart, are below the action level, at which time the monitoring for that employee or operation may be discontinued.

If the initial monitoring reveals that employee exposure is above the permissible exposure limit, the monitoring shall be repeated quarterly. The monitoring shall continue until at least two consecutive measurements, taken at least 7 days apart, are below the permissible exposure level, at which time the monitoring for that employee or operation may be discontinued.

7.4. Additional monitoring - whenever there has been a production, process, control or personnel change which may result in new or additional exposure to lead, or whenever the employer has any reason to suspect a change which may result in new or additional exposures to lead, additional monitoring shall be conducted. Exposure monitoring shall be conducted immediately at the start of the operation, and shall be representative of the exposure for each employee in the workplace who is exposed to lead.

7.5. Observation of monitoring. This employer will provide employees or their representatives with the opportunity to observe monitoring of employee exposures to lead. Observers will be entitled as a minimum to the following:

- An explanation of the measurement procedure.
- To observe all steps related to the measurement procedure.
- To record the results obtained.

7.6. Signs shall be posted in each work area where the Permissible Exposure Level is exceeded. The signs shall be illuminated and cleaned as necessary and shall read:

WARNING
HAZARD
LEAD WORK AREA
NO SMOKING, EATING OR DRINKING

7.7. Protective work clothing and equipment shall be provided to employees as appropriate. It is each employee's responsibility to use the appropriate protective work clothing and equipment such as, but not limited to:

- Disposable Tyvek coveralls or similar full-body work clothing.
- Disposable shoe coverlets, gloves, and head coverings.
- Face shields, vented goggles, welders gloves, etc.

7.8. Disposable protective clothing shall be removed at the end of the job, at the perimeter of the job location, and placed in a plastic bag for transport to Physical Plant for disposal as hazardous waste. Contaminated protective clothing and equipment must not be worn outside of the immediate area of the job location. . In order to prevent dispersal of lead dust, care should be taken to avoid blowing, shaking or otherwise handling contaminated protective clothing and equipment.

7.9. Other reusable protective equipment, such as safety glasses and respirators, should be washed in warm soapy water, and allowed to air dry before storage.

Contaminated protective clothing and equipment, plastic sheeting and lead debris shall be disposed of as hazardous waste:

- Solid (elemental) lead should be disposed into the covered drum in the Physical Plant Stock Room. This drum is labeled "Hazardous Waste", the hazardous constituent being "Lead", and the hazard marked "Toxic".
- The bag of contaminated protective clothing and equipment will be placed in a covered plastic pail, and labeled with a "Hazardous Waste" label, with the hazardous constituent being "Lead", and the hazard marked "Toxic".
- Paint chips and debris that contain lead, will be collected and disposed in the covered drum stored in the Physical Plant Paint Shop. This drum is labeled "Hazardous Waste", the hazardous constituent being "Lead", and the hazard marked "Toxic".

7.10. Housekeeping. All surfaces shall be maintained as free as practicable of accumulations of lead.

- Floors and other surfaces where lead accumulates shall not be cleaned by the use of compressed air or heavy sweeping. Care will be taken at all times to reduce the lofting of material into the ambient air.
- When vacuuming or other equally effective methods are not feasible, wet methods, including wet sweeping, wet shoveling, or wet brushing, shall be used. Dry methods may be used only when vacuuming and wet methods are not practicable.
- When vacuuming methods are utilized, only a vacuum with an High Efficiency Particulate Air (HEPA) filter shall be used and the residue collected shall be treated and disposed of as hazardous waste.

7.8 Hygiene Facilities and Practices.

- Eating, drinking, smoking or applying cosmetics is prohibited in areas where employees are exposed to lead above the Permissible Exposure Limit (PEL).
- Employees who work in areas where there is airborne exposure to lead

shall wash their hands and face prior to eating, drinking, smoking, or applying cosmetics.

- Employees shall not enter food and beverage consumption areas wearing protective work clothing or equipment unless surface lead dust has been removed by vacuuming or other approved cleaning methods.
- Employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators, shall shower or wash at the end of the work shift.

8. **Permissible Exposure Limits (PEL).** No employee shall be exposed to lead at concentrations greater than 50 micrograms per cubic meter of air (50 ug/m3) averaged over an 8 hour period. If an employee is exposed to lead for more than 8 hours in any day, the permissible exposure limit, as a time weighted average (TWA) for that day, shall be reduced according to the following formula: Maximum Permissible Limit (expressed in ug/m3) = 400 divided by the hours worked in that day.

8.1. When respirators are used to supplement engineering and work practice controls to comply with the PEL and all the requirements of respiratory protection have been met, employee exposure, for the purpose of determining whether this employer has complied with the PEL, may be considered to be at a level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

9. **Recordkeeping.** Connecticut College will keep all records of exposure monitoring for airborne lead.

9.1. These records will include as a minimum the following:

- Name and job classification
- Details of sampling and the analytic technique used
- Results of sampling
- Type of respiratory protection being worn

9.2. Records of biological (Medical Surveillance) monitoring will include:

- Names of the employee
- The physician's written opinion
- A copy of the results of the examination

9.3. Records retention. All lead related records listed above, must be kept for 40 years, or for at least 20 years after termination of employment, whichever is longer. Records will also be retained if the employee is temporarily removed from the job under the medical removal protection program. This record will include:

- The employees name and social security number
- How the removal was or is being accomplished
- Dates of removal from work and return
- Details of how each removal was or is being accomplished
- Whether or not the removal was due to elevated BLL

9.4. Connecticut College will keep each medical removal record for the duration of an employee's employment. For employees who request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they will be made available to the employee or to a representative that he or she authorizes. The union (if in place) also will have access to these records. Medical records other than PbB's will also be provided upon request, to the attending physician or to any other person whom the employee may specifically designate. Union officials will not have access to employee personal medical records unless the employee authorizes access.

10. Definitions.

Action Level - means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 ug/m3) averaged over an 8 hour period.

Lead - means metallic lead, all inorganic lead compounds, and inorganic lead soaps. Excluded from this definition are all other organic lead compounds.

Permissible Exposure Limit (PEL) - the legally established time-weighted average (TWA) concentration or ceiling concentration of a contaminant that shall not be exceeded. No employee shall be exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 ug/m3) averaged over an 8-hour period.