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Applicable OSHA Standards: 29 CFR 1910.1028, 1926.1128

## 1. Purpose

- 1.1 The following written *Benzene Protection Program* has been established for Cleveland Integrity Services Inc. employees who, in the course and scope of their work, may be in an area where benzene is, or could be present; or in the event of an accidental exposure to benzene.
- 1.2 When any such exposures are over the PEL, this *Benzene Protection Program* will be implemented and followed to reduce employee exposure to or below the PEL primarily by means of engineering and work practice controls in accordance with requirements of 1910.1028.
- 1.3 A specific benzene safety program based upon requirements of 29 CFR 1910.1028 and 1926.1128 and this *Benzene Protection Program* will be written for each project that presents an exposure to benzene. Each such project-specific program will include a schedule for development and implementation of the engineering and work practice controls. These plans will be reviewed and revised as appropriate based on the most recent exposure monitoring data for the project, to reflect the current status of each program.
- 1.4 Written compliance programs will be furnished upon request for examination and copying to the Assistant Secretary of the U.S. Department of Labor; the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee; affected employees and designated employee representatives.

## 2. Scope

- 2.1 The written Benzene Protection Program will apply to all Cleveland Integrity Services Inc. employees and employees of subcontractors. This program will be considered the minimum requirements and if conflicts arise between customer/client programs or applicable regulatory requirements, the most stringent will apply.

## 3. Definitions

- 3.1. Action Level: Means an airborne concentration of benzene of 0.5 ppm calculated as an 8-hour time weighted average.
- 3.2. Authorized Person: Means any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employer, for the purpose of exercising the right to observe monitoring and measuring procedures.

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- 3.3. Benzene (C<sup>6</sup>H<sup>6</sup>) Means Liquefied or Gaseous Benzene: It includes benzene contained in liquid mixtures and the benzene vapors released by these liquids. It does not include trace amounts of un-reacted benzene contained in solid materials, unless vapor concentration exceeds the action level.
- 3.4. Employee Exposure: Means exposure to airborne benzene, which would occur if the employee were not using respiratory protective equipment.

#### **4. Responsibilities**

- 4.1. The Project Manager or Site Supervisor will be responsible for disciplinary action resulting from failure to follow the guidelines as set forth in this program.
- 4.2. The company Safety Coordinator or designee will be responsible for the monitoring and guidance for the implementation of this program.
- 4.3. The First Line Supervisor, Foreman, or Leadsperson of record will be responsible for the implementation and training of the benzene program.
- 4.4. When the Company performs work in a host facility where benzene is used, employees will be notified about the location of benzene in the facility, as well as procedures to follow if a leak or accidental release is suspected.
- 4.5. Employees also will be informed about any safety rules, contingency or emergency plans and procedures in place specifically for benzene.

#### **5. Potential Exposure Locations & Situations**

- 5.1. Employees have potential for exposure to benzene in situations where they may come in contact with gasoline products during pipeline repair and maintenance operations.
- 5.2. Potential locations where foreseeable exposure may occur are:
  - 5.2.1. Gasoline and petroleum pipelines
  - 5.2.2. Pipeline valve assemblies
  - 5.2.3. Tank repair, maintenance and cleaning operations at plant and pipeline facilities
  - 5.2.4. Field maintenance operations
  - 5.2.5. Refinery operations
  - 5.2.6. Marine, rail, bulk terminals and service station operations

#### **6. Characteristics and Health Effects of Benzene**

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- 6.1. Benzene is toxic. It has a clear, colorless liquid with a pleasant, sweet odor.
- 6.2. The odor of benzene does not provide adequate warning of its hazard.
- 6.3. Benzene can seriously affect a person's health if it is swallowed, inhaled, or if it comes in contact with the skin or eyes.
- 6.4. Short-term (acute) overexposure to high concentrations of benzene (well above the levels where its odor is first recognizable) can cause someone to feel breathless, irritable, euphoric or giddy. There may be irritation in the eyes, nose and respiratory tract. Other symptoms may include headache, feeling dizzy, nauseated or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.
- 6.5. Long-term (chronic) exposure to benzene (repeated or prolonged) can occur even at relatively low concentrations. Chronic exposure may result in various blood disorders ranging from anemia to leukemia -- an irreversible and potentially fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms.
- 6.6. Benzene liquid is highly flammable. Its vapors can form explosive mixtures.
- 6.7. Benzene vapors are heavier than air and can travel along the ground. Consequently, accidental ignition by sparks or an open flame can occur at locations remote from the site where the benzene is being handled.
- 6.8. Benzene does not dissolve in water.
- 6.9. Hazardous decomposition products of benzene are toxic gases and vapors (such as carbon monoxide).

## **7. Safe Work Procedures**

- 7.1. Site-specific safe work procedures will be developed as required based on requirements of this program and other related company safety and health requirements (i.e. proper selection and use of PPE, respiratory protection, fire safety, responding to a leak or spill).
- 7.2. Because benzene liquid is highly flammable and its vapors form explosive mixtures in the air, smoking, open flames and other potential sources of ignition are prohibited in areas where benzene is being handled or where there is a benzene exposure
- 7.3. Fire extinguishers will be readily available by trained employees in areas where there is exposure to benzene.
- 7.4. Host employers have the responsibility to inform Company personnel of any benzene exposures in a job site or facility prior to work commencing. Site-specific

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planning for benzene exposures will be coordinated with host employer safety procedures, planning and protocols. Company employees performing work will be notified and informed about host employer benzene safety and health procedures.

## **8. Medical Surveillance**

- 8.1. Medical surveillance will be performed for all Company employees who may be exposed to benzene, at or above the action level 30 or more days per year, or employees who are or may be exposed to benzene at or above the permissible exposure limits for 10 or more days per year, or for employees who have been exposed to more than 10 ppm of benzene for 30 days or more in a year prior to the effective date of the standard when employed by their current employer.
- 8.2. All medical examinations and procedures will be performed by or under the supervision of a licensed physician.
- 8.3. An accredited laboratory will conduct all laboratory tests.
- 8.4. All cost for physicals and laboratory work etc. will be paid by Cleveland Integrity Services Inc..
- 8.5. Initial Exam
  - 8.5.1. The Company will provide employees who work in an area where he/she could be exposed to benzene, a medical examination to include the following:
    - 8.5.1.1. Detailed occupational history which includes:
      - 8.5.1.1.1. Post work exposure to benzene or other hematological toxins.
      - 8.5.1.1.2. A family history of blood diseases includes hematological neoplasms.
      - 8.5.1.1.3. A history of blood diseases including genetic hemoglobin abnormalities, bleeding abnormalities, abnormal function of formed blood elements.
      - 8.5.1.1.4. A history of renal or liver dysfunction.
      - 8.5.1.1.5. A history of medical drugs routinely taken.
      - 8.5.1.1.6. A history of previous exposure to ionizing radiation.
      - 8.5.1.1.7. Exposure to marrow toxins outside of the current work situation.

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8.5.1.2. Complete Physical Examination

8.5.1.3. Laboratory Test

8.5.1.4. Complete blood count, including a leukocyte counts with differential.

8.5.1.4.1. Quantitative thrombocyte counts.

8.5.1.4.2. Hematocrit

8.5.1.4.3. Hemoglobin

8.5.1.4.4. Erythrocyte counts

8.5.1.4.5. The results of the above laboratory tests will be reviewed by the examining physician.

#### 8.6. Periodic Examinations

8.6.1. The Company will provide each employee a medical examination annually. This examination will include the following:

8.6.1.1. A brief history regarding any new exposure.

8.6.1.2. Changes in medical drugs used.

8.6.1.3. Appearance of physical signs relating to blood disorders.

8.6.1.4. A complete blood count including:

8.6.1.4.1. Leukocyte counts with differential

8.6.1.4.2. Quantitative thrombocyte counts

8.6.1.4.3. Hemoglobin

8.6.1.4.4. Hematocrit

8.6.1.4.5. Erythrocyte counts

8.6.1.4.6. Erythrocyte indicates (MCV, MCH, MCHC)

8.6.2. If an employee develops signs or symptoms commonly associated with toxic exposure to benzene, the Company will provide the employee with an additional examination, which will include those elements considered appropriate by the examining physician.

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## 8.7. Post Employment Examination

8.7.1. At the conclusion of a job that required benzene physicals each employee will have a complete physical examination before the employee is ROF or transferred to another job-site that has no benzene hazard. This physical will include:

8.7.1.1. Complete blood count, including a leukocyte counts with differential.

8.7.1.2. Quantitative thrombocyte counts.

8.7.1.3. Hematocrit

8.7.1.4. Hemoglobin

8.7.1.5. Erythrocyte counts

## 8.8. Emergency Examinations

8.8.1. In addition to the surveillance required, if an employee is exposed to benzene in an emergency situation the Company will have the employee provide a urine sample and have a Phenol Test performed on the sample. The urine specific gravity will be corrected to 1.024.

8.8.2. If the result of the urinary phenol test is below 75mg Phenol level of urine, no further testing is required.

8.8.3. If the result of the urinary phenol test is equal to or greater than 75mg the Company will provide the employee with a complete blood count, leukocyte count, with differential and thrombocyte count at monthly intervals for duration of three months.

8.8.4. If conditions warrant after three months and a physician deems necessary, the Company will provide its employee with additional physicals per physician's direction.

## 8.9. Additional Examinations and Referrals

8.9.1. Where the results of the complete blood count required for the initial and periodic examinations indicate any of the following abnormal conditions exist, then the blood count will be repeated within 2 weeks.

8.9.2. The hemoglobin level or the hematocrit falls below the normal limit [outside the 95% confidence interval (C.I.)] as determined by the laboratory for the particular geographic area and/or these indices show a persistent downward trend from the individual's pre-exposure norms; provided these findings cannot be explained by other medical reasons.

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8.9.3. The thrombocyte (platelet) count varies more than 20% below the employee's most recent values or falls outside the normal limit (95% C.I.) as determined by the laboratory.

8.9.4. The leukocyte count is below 4,000 per mm<sup>3</sup> or there is an abnormal differential count.

8.9.4.1. If the abnormality persists, the examining physician will refer the employee to a hematologist or an internist for further evaluation unless the physician has good reason to believe such referral is unnecessary.

8.9.4.2. The employer will provide the hematologist or internist with the information required to be provided to the physician.

8.9.4.3. The hematologist's or internist's evaluation will include a determination as to the need for additional tests, and the employer will assure that these tests are provided.

#### 8.10. Information provided to the Physician

8.10.1. The employer will provide the following information to the examining physician.

8.10.1.1. A copy of this regulation and its appendices.

8.10.1.2. A description of the affected employee's duties as they relate to the employee's exposure.

8.10.1.3. The employee's actual or representative exposure level.

8.10.1.4. A description of any personal protective equipment used or to be used.

8.10.1.5. Information from previous employment related medical examinations of the affected employee, which is not otherwise available to the examining physician.

#### 8.11. Physician's Written Opinions

8.11.1. For each examination under this section, the Company will obtain and provide the employee with a copy of the examining physician's written opinion within 15 days of the examination. The written opinion will be limited to the following information.

8.11.2. The occupationally pertinent results of the medical examination and tests.

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- 8.11.3. The physician's opinion concerns whether the employee has any detected medical conditions, which would place the employee's health at greater than normal risk of material impairment from exposure to benzene.
- 8.11.4. The physician's recommended limitations upon the employee's exposure to benzene or upon the employee's use of protective clothing or equipment and respirators.
- 8.11.5. A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions resulting from benzene exposure which require further explanation or treatment.
- 8.11.6. The written opinion obtained by the employer will not reveal specific records, findings and diagnosis that have no bearing on the employee's ability to work in a benzene-exposed workplace.

#### 8.12. Medical Removal Plan

- 8.12.1. When a physician makes a referral to a hematologist/internist as required under this section, the employee will be removed from areas where exposures may exceed the action level until such time as the physician makes a determination.
- 8.12.2. Following the examination and evaluation by the hematologist/internist, a decision to remove an employee from areas where benzene exposure is above the action level or to allow the employee to return to areas where benzene exposure is above the action level will be made by the physician in consultation with the hematologist/internist. This decision will be communicated in writing to the employer and employee. In the case of removal, the physician will state the required probable duration of removal from occupational exposure to benzene above the action level and the requirements for future medical examinations to review the decision.
- 8.12.3. For any employee who is removed pursuant to this section, the Company will provide a follow-up examination. The physician, in consultation with the hematologist/internist, will make a decision within 6 months of the date the employee was removed as to whether the employee will be returned to the usual job or whether the employee should be removed permanently.
- 8.12.4. Whenever an employee is temporarily removed from benzene exposure pursuant to this section, the Company will transfer the employee to a comparable job for which the employee is qualified (or can be trained for in a short period) and where benzene exposures are as low as possible, but in no event higher than the action level. The Company will maintain the employee's current wage rate, seniority and other benefits. If there is no such job available, the Company will provide medical removal protection benefits until such a job becomes available or for 6 months, whichever comes first.



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- 8.12.5. Whenever an employee is removed permanently from benzene exposure based on a physician's recommendation pursuant to this section, the employee will be given the opportunity to transfer to another position which is available, or later becomes available, for which the employee is qualified (or can be trained for in a short period) and where benzene exposures are as low as possible but in no event higher than the action level. The employer will assure that such employee suffers no reduction in current wage rate, seniority or other benefits as a result of the transfer.

#### 8.13. Medical Removal Protection Benefits

- 8.13.1. The Company will provide to an employee six months of medical removal benefits immediately following each occasion an employee is removed (from exposure to benzene because of hematological findings from exposure to benzene) unless the employee has been transferred to a comparable job where benzene exposures are below the action level. For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer will maintain the current wage rate, seniority and other benefits of an employee as though the employee had not been removed.
- 8.13.2. The Company's obligation to provide medical removal protection benefits to a removed employee will be reduced to the extent that the employee received compensation for earnings lost during the period of removal either from a publicly or employer funded compensation program, or from employment with another employer made possible by virtue of the employee's removal.

### 9. Recordkeeping for Health Hazard Compliance Program

#### 9.1. General

- 9.1.1. The company is required to keep all records of an employee's exposure to benzene and medical surveillance for a period of duration of employment plus (+) thirty (30) years, or, forty (40) years whichever is the longer.
- 9.1.2. Specific records to be kept include:
- 9.1.2.1. All records associated with monitoring, the results of individual monitoring and acknowledgment that the employee was informed of the results of the monitoring.
- 9.1.2.2. All records pertaining to medical surveillance and the acknowledged results of all examinations.

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## 9.2. Storage

- 9.2.1. All records subject to these provisions will be stored in the affected employee's personnel jacket/folder maintained at the Corporate Office(s).
- 9.2.2. This is necessary since our projects do not normally have safe and secure storage facilities onsite.
- 9.2.3. Any records can be made available to proper authorities from this office.

## 9.3. Copies

- 9.3.1. Copies of pertinent records will be made available only to the individual, a duly authorized representative of the individual, or the individual's personal physician (in case of medical records) and then by written request to the Corporate Office only.

# 10. Use of Respirators

- 10.1. When employees use respirators as required by this program, the company will provide respirators that comply with the requirements of 1910.1028(g)(1).  
Respirators must be used during:
  - 10.1.1. Periods necessary to install or implement feasible engineering and work-practice controls.
  - 10.1.2. Work operations for which the company establishes that compliance with either the TWA or STEL through the use of engineering and work-practice controls is not feasible. (For example, some maintenance and repair activities, vessel cleaning, or other operations for which engineering and work-practice controls are infeasible because exposures are intermittent and limited in duration).
  - 10.1.3. Work operations for which feasible engineering and work-practice controls are not yet sufficient, or are not required by OSHA standards to reduce employee exposure to or below the PELs.
  - 10.1.4. In emergency situations.

# 11. Respiratory Protection Program

- 11.1. The company will supply approved respirators and filters for all benzene hazards which an employee would encounter at the job-site at no cost to the employee.
  - 11.1.1. The company will train all employees operating under the *Benzene Protection Program* in the proper use, maintenance and limitation of the respirator they will be using.

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11.1.2. The company will provide medical physical examination and fit testing for all employees required to wear a respirator (refer to the company's Respiratory Protection Program).

11.2. The company has established and implemented a written Respiratory Protection Program in accordance with 29 CFR 1910.134. Any use of respirators relating to benzene exposure will be done in compliance with the company's Respiratory Protection Program.

11.3. For air-purifying respirators, the company will replace the air-purifying element at the expiration of its service life or at the beginning of each shift in which such elements are used, whichever comes first.

11.4. If NIOSH approves an air-purifying element with an end-of-service-life indicator for benzene, such an element may be used until the indicator shows no further useful life.

## **12. Respirator Selection**

12.1. Selection of respirators will be based on airborne concentrations of benzene or conditions where respirators will be used. The company supervisor in charge of a project where respirators will be used due to benzene exposure will select the appropriate respirator from Table 1 of section 1910.1028 (g)(3) .

12.2. Any employee who cannot use a negative-pressure respirator will be allowed to use a respirator with less breathing resistance, such as a powered air-purifying respirator or supplied-air respirator.

12.3. All respirators selected will be approved by NIOSH.

## **13. Protective Clothing and Equipment**

13.1. Personal protective equipment will be utilized as needed to prevent liquid benzene contact with the eyes and to limit skin exposure.

13.2. Protective clothing (such as barrier overalls, aprons, sleeves, gloves, boots, etc.) will be worn over any parts of an affected employee's body that could be exposed to liquid benzene.

13.3. Protective clothing and equipment will be provided by the company at no cost to the employee. The company, through its supervisors, will assure proper use of protective clothing and equipment where appropriate.

13.4. Employees will wear splash-proof safety goggles if it is possible that benzene may get into the eyes. In addition, employees will wear a face shield if the face could be splashed with liquid benzene.

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13.5. PPE must meet the requirements of 29 CFR 1910.133 and provided at no cost to the employees.

#### 14. **Notes to Exposure Model**

##### 14.1. Less than 0.5 ppm

- 14.1.1. Upon implementation of this *Benzene Compliance Program* and annually thereafter, project evaluations will be made to determine the presence of benzene on this project, as applicable.
- 14.1.2. All employees will be presented the company's Benzene Training Program including respiratory protection and placed on the Authorized Persons Listing.
- 14.1.3. If benzene is present on a project, initial monitoring will be conducted to determine the degree of exposure of our people to benzene.
- 14.1.4. The initial medical surveillance will be performed on all employees who have the possibility of benzene exposure.
- 14.1.5. This medical surveillance will be repeated if the employee during the previous year has had any opportunity to be exposed to benzene.
- 14.1.6. In addition, annual monitoring will be conducted to determine if the project in general is exposing our people to less than 0.5 PPM over an eight-hour time weighted average.

##### 14.2. Equal to or Greater than 0.5 PPM, but less than 1.0 ppm

- 14.2.1. All exposed employees will be placed in our initial medical surveillance program.
- 14.2.2. All employees will be presented our Benzene Training Program including respiratory protection and placed upon Authorized Persons Listing.
- 14.2.3. Medical surveillance will be repeated on a semi-annual basis.
- 14.2.4. Monitoring will be completed on a quarterly basis until such time that two consecutive personnel monitoring programs show that the employee has been exposed to less than 0.5 PPM.
- 14.2.5. If quarterly monitoring results indicate that exposure levels are below 0.5 ppm, the project will then only be required to repeat the monitoring and medical surveillance on an annual basis.
- 14.2.6. Any change in the project that could cause exposures to increase over the 0.5 ppm, the requirements for 0.5 ppm or greater will be followed.

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14.3. Equal to, or Greater than 1.0 ppm-to Equal to 10.0 ppm

- 14.3.1. Employees working in areas where benzene exposure is greater than 1.0 ppm (up to 10.0 ppm) will be equipped with a chemical cartridge respirator with an organic vapor cartridge and half mask or any type of supplied air respirator with half mask. They will not be allowed to work in any area containing more than 1.0 ppm benzene without proper respiratory equipment.
- 14.3.2. All employees will be presented our Benzene Training Program including respiratory protection and placed upon Authorized Persons Listing.
- 14.3.3. Respiratory protective program will be presented and a follow-up made to be certain that our employees are complying with such program.
- 14.3.4. Medical surveillance will be completed within thirty days of implementation of this program or the discovery of benzene environments greater than 1.0 ppm.
- 14.3.5. All medical surveillance will be repeated semi-annually.
- 14.3.6. Monitoring program will be repeated on a monthly basis until such time that two consecutive months show that the exposure level is less than 1.0 ppm.
- 14.3.7. In addition, all other parts of compliance of this program will be followed including authorized persons list and sign in and sign out of the area.

14.4. Greater than 10.0 ppm, but less than or equal to 50 ppm

- 14.4.1. When exposure levels have been found to be this high, immediate steps should be taken to withdraw company employees from the area except those necessary to establish engineering and work practice controls to reduce the exposure levels to below 10.0 ppm and preferably below 1.0 ppm.
- 14.4.2. While working in areas performing engineering and work practice controls, our employees will be equipped and required to wear chemical cartridge respirators with organic vapor cartridge and full-face piece, or any supplied air with full-face piece or any organic gas mask, or any self-contained breathing apparatus with full-face piece.
- 14.4.3. Prior to admittance to the area, these employees will have completed all training programs, medical surveillance programs, and respiratory protection program, and will be placed on authorized persons list and will be required to sign in and out of the restricted area.

14.5. Benzene Exposure greater than 50.0 ppm but equal to or less than 1000 ppm

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- 14.5.1. Company employees will be allowed in this area only for the purpose of establishing engineering and work practice controls.
- 14.5.2. They will be equipped with supplied air respirator with half mask and positive pressure mode.
- 14.5.3. Prior to admittance into the area, all employees will be instructed in our training respiratory protective programs and have completed all medical surveillance and been placed on our authorized persons list. In addition, they will sign in and out while in the area to perform engineering controls.
- 14.6. Benzene Exposure greater than 1000 ppm but equal to or less than 2000 ppm
  - 14.6.1. Company employees will be equipped with supplied air respirators with full-face piece, helmet or hood and positive pressure mode. All requirements as established above will be followed.
- 14.7. Greater than 2000 ppm but equal to or less than 10,000 ppm
  - 14.7.1. Company employees, if allowed in this area, will be allowed only to shut off valves and to perform emergency operations. They will be equipped with a supplied air respirator and auxiliary self-contained breathing apparatus with full-face piece and positive pressure mode.
  - 14.7.2. In addition, all other requirements as outlined above will be followed.

## 15. Escape

- 15.1. Since benzene can be fatal in only a very short period of time at concentrations greater than 10,000 ppm, anyone exposed to areas of such high concentration will use any organic vapor gas mask or self-contained breathing apparatus with full face piece for purposes of escape from the area.
- 15.2. This escape will be undertaken immediately upon the sensing of vapors or an alarm of vapors being this high.
- 15.3. EMERGENCY SITUATION: Equal to or greater than 100 ppm
  - 15.3.1. Where an employee is exposed to a massive release of benzene (100 ppm) due to some type of failure, the employee will be required to participate in special medical tests program.
  - 15.3.2. Special tests will be provided by the end of the employee's work shift.
  - 15.3.3. If the results of the tests are positive, additional tests will be provided as soon as practicable and repeated one month later.