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ENVIRONMENTAL ASSESSMENT

OF THE

AIDS SURVEILLANCE AND EDUCATION PROJECT

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EXECUTIVE SUMMARY

The AIDS Surveillance and Education Project (ASEP) is a joint undertaking of the Department of Health and USAID to establish the institutional mechanisms in the public and private sectors to: a) develop a national HIV/AIDS sentinel surveillance system and b) expand Information, Education and Communication (IEC) activities, targeting individuals at high risk of becoming infected with HIV/AIDS and raising the general public's awareness about the importance of preventing HIV infection. The sentinel surveillance system will require obtaining blood samples from individuals in selected sentinel groups (i.e., high-risk groups). As many as thirty surveillance sites are planned for national coverage. Approximately one thousand blood samples will be collected every six months at the sites, producing a corresponding amount of used medical materials which are potentially HIV contaminated.

The proper handling of these materials so as to eliminate or substantially reduce the risk of accidental infection of individuals who may come into contact with them is the main focus of the Environmental Assessment. The risk of accidental infection is the "reasonably foreseeable environmental effect" of ASEP. Recommendations for managing these materials in ways which reduce this risk and are not environmentally harmful are as follows:

- The general strategy to be followed is to initiate decontamination of materials by the technical staff involved with blood collection and by the medical technicians conducting the testing prior to the release of these materials for subsequent processing through the hospitals established procedures.

- Needles used with vacutainers will be deposited in a puncture-proof container (e.g., powdered milk containers) which contains a fresh solution of sodium hypochlorite. These containers will have a small slit or opening cut in them large enough to allow depositing of the needle immediately after use. The medical technician collecting the blood samples will bring a can containing the solution to the collection site. These cans will be delivered to the Regional Hospital/Laboratory where they will be buried in the hospital grounds at a "dedicated site" for this purpose to prevent scavenging for sale or reuse. Surveillance will be undertaken in 30 different sites and each site will dispose of its own waste. The volume of sodium hypochlorite that will be buried dring the entire period of the surveillance program will not cause a significant negative impact on the environment.

- The vacutainer system that will be used to collect blood samples will be held in sturdy racks placed inside leak-proof

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containers lined by an absorbent pad. If spills occur, sodium hypochlorite should be used to clean contaminated surfaces and materials. The containers are safe and easy to use by experienced laboratory technicians. Blood samples, i.e., the blood clots resulting from testing, can be safely disposed of by pouring them down the sink and decontaminating the sink with sodium hypochlorite.

- Rubber gloves which can be reused will be washed, and then autoclaved. Contaminated paper and gloves which are punctured, torn or in some way unusable will be deposited in a color-coded biohazard bag and then disposed of along with other the hospital wastes (i.e., burning).

- Test tubes, pipettes and other glassware which can be reused will be washed, decontaminated with sodium hypochlorite and then autoclaved if sterilization is necessary. Broken glassware will be deposited in a color-coded biohazard bag, placed in hard-sided containers, autoclaved or decontaminated with sodium hypochlorite, and then disposed of with other hospital wastes (e.g., trash placed in hard-sided contianers taken to a dump site).

To incorporate these procedures into the Operational Plan for HIV surveillance, the following recommendations are made:

- As part of the preparatory training sessions conducted prior to field work, these procedures will be reviewed with technicians involved with blood sample collection and HIV testing. Additional or special training or laboratory procedures are not necessary for the following reasons: a) the individuals involved with the surveillance system are well trained and experienced laboratory technicians, b) the medical materials potentially contaminated with HIV are handled the same way as those used for other medical purposes and c) the existing procedures regional laboratories follow for handling bio-hazardous, infectious or toxic materials are adequate for HIV.

- Responsibility for assuring these procedures are followed will be assigned to the Surveillance Site Managers, typically a pathologist from the testing laboratory or senior medical technician. The Site Manager, therefore, will be the principal monitor of proper handling of used materials. This includes assuring that the technicians have proper containers for needles, that a fresh sodium hypochlorite solution has been prepared and that cans containing used needles are properly buried on hospital grounds. BRL and RITM staff responsible for the national surveillance system will periodically check on adherence to these procedures as part of their regular site visits (e.g., inspecting the "dedicated" burial site, checking in trash cans at the laboratory, spot checks at blood collection sites).

- These procedures and responsibilities will be specified in the Operational Plan for the National HIV Surveillance System.

- The costs of these procedures are negligible and can be absorbed by the budgets of the laboratories (e.g., one liter powdered milk cans with sodium hypochlorite solution). ASEP funding will cover all other supplies (i.e., vacutainers, additional gloves and sodium hypochlorite solution, hard-sided containers, leak-proof contaniers lined with absorbent pads,the particle agglutination test kits).

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ACRONYMS

AIDS - Acquired Immunodeficiency Syndrome
ASEP - AIDS Surveillance and Education Project
BRL - Bureau of Research and Laboratories
CDC - Centers for Disease Control
DOH - Department of Health
EA - Environmental Assessment
HIV - Human Immunodeficiency Virus
IEC - Information, Education and Communication
MMA - Metro Manila Authority
RITM - Research Institute for Tropical Medicine
USAID - United States Agency for1236XInternationaDevelopment
WHO - World Health Organizaton

GLOSSARY

Autoclave - an apparatus for effecting sterilization by steam under pressure; it is fitted with a gauge that automatically regulates the pressure, and therefore the degree of heat to which the contents are subjected.

Biohazard - potential danger posed by a living or a biologically-derived material

Combustibles - pertains to any laboratory/medical/ surgical supplies/instruments which are flammable and can be destroyed by burning (i.e., gloves, absorbent paper, gauze, cotton, etc.)

Decontamination - the freeing of an object of some contaminating
Environmentanceumans and their surroundings including the earth's

sub-surface

Incineration - the act of burning to ashes; cremation

Non-combustibles - pertains to any laboratory/medical/ srgical supplies/instruments which are inflammabale and can not be destroyed by burning (i.e., test tubes, glass pipettes, vacutainar tubes, etc.)

Sharps - pertains to any laboratory /medical/surgical instruments/supplies which can puncture and/or lacerate skin and mucosa (i.e., needles, scalpel blades, lancets, etc.)

Sterilization -696Xthemplete elimination of microbial viability.

1. Introduction: Background to the Environmental Assessment of AIDS Surveillance and Education Project

Health projects are usually accorded a "categorical exclusion" from A.I.D. regulations for Environmental Assessments because they produce no significant effects harmful to the environment. The sentinel surveillance system to be developed with ASEP funding, however, will generate contaminated medical materials. Given the current practices followed for medical waste management in the Philippines, the DOH and USAID recognized that these materials pose a potential environmental hazard if not properly managed. It was decided, therefore, that an Environmental Assessment (EA) would be needed to recommend procedures to assure that these materials would be properly managed as part of the surveillance system. These recommendations for handling medical materials used for the surveillance system must eliminate or greatly reduce the risk of accidental HIV infection. These procedures, in turn, must not produce environmentally harmful effects.

The EA team conducted initial investigations into the current medical waste management practices of Regional Laboratories where the HIV testing would be conducted. Though each laboratory has its own protocols for handling these materials, the team concluded that these were inadequate to assure reliable, safe management of the materials used for the surveillance system. Procedures for proper handling of these materials need to be incorporated into Operational Plan for the surveillance system. Personnel involved with blood collection and HIV test must be made aware of these procedures. Responsibility for assuring that these procedures are followed needs to be assigned to the appropriate individuals at the surveillance sites with periodic external monitoring to check on compliance.

Based on the EA team's initial findings, a Discussion Paper with options for managing these materials was prepared for an Environmental Assessment Scoping Session, held in Manila on October 23, 1992. The Discussion Paper provided a framework for guiding the Scoping Session. Thirty-two participants attended the Scoping Session, representing a broad cross-section from the private and public health communities. The Scoping Session provided a thorough review of the issues and options presented in the Discussion Paper. The participants revised the options suggested by the EA team, added an additional criterion for comparing these options, established the relative importance of each criterion and then scored each option on a five point scale using the criteria. This process identified the options recommended in this report as the best approaches to be followed, taking into account medical effectiveness, environmental safety, practicality, cost and training and monitoring requirements.

(Copies of the Discussion Paper and the Scoping Session Report are available from the Office of Health, Population and Nutrition, USAID/Philippines.)

2. PROJECT DESCRIPTION AND REASONABLY FORESEEABLE ENVIRONMENTAL EFFECTS

2.1 Introduction: The AIDS Epidemic in the Philippines

In other countries, such as Thailand and India, Human Immunodeficiency Virus (HIV) infection has already reached epidemic proportions. Though the exact stages of the epidemic vary among countries, it is reasonable and prudent to assume that the epidemic experienced elsewhere can occur in the Philippines over the next few years. Many of the same high-risk behaviors which have been major vectors for the spread of HIV in other countries are prevalent in the Philippines. Vigorous efforts are needed now to determine the prevalence and spread of the disease and to expand advocacy of preventive behaviors among high-risk groups and the general population.

The lack of reliable surveillance data on the prevalence and spread of HIV infection currently handicaps efforts to generate greater attention to the need for AIDS prevention. Because of its long incubation period, HIV can infect a significant proportion of a population before an increase in full-blown AIDS appears. In Thailand, HIV infection rates among intravenous drug users jumped from below 1% to 30% over a 9 month period in injecting drug users. The disease rapidly spread to other population groups and is now an overwhelming problem. It was not until reliable data on the prevalence of infection was made available through a national sentinel surveillance system that the seriousness of the HIV/AIDS problem in Thailand was widely recognized. A similar situation could be underway in the Philippines - i.e., HIV infection spreading at an increasing rate but unrecognized due to the absence of a surveillance system.

Currently available surveys and research studies suggest that HIV infection rates are around 1 per 1000 in high risk groups in the Philippines. However, current data on the actual number of HIV infected individuals - 348 as of October 1992 - is known to be a gross underestimate of the actual infection level due to the biases in the selection of individuals for testing. A disturbing fact is that when Thailand reported a similar level of infection (prior to its surveillance system), subsequent data showed that the actual reported number was off by a factor of one thousand. This would mean that the current number of HIV infected individuals in the Philippines could be as high as 30,000 and spreading.

The principal reason for establishing a national sentinel surveillance system is to monitor HIV prevalence and its

transmission. If transmission rates suddenly increase, this information will be critical for encouraging necessary behavioral changes. Increased infection levels will also require targeting IEC interventions on the groups and in the geographic areas where risk of infection is highest.

Failure to take the necessary steps to control and prevent the spread of HIV/AIDS at the early stages of the epidemic has occurred time and again in other countries. The costs of responding to the epidemic after it reaches serious levels is far greater than taking action to control the spread of the disease at an early stage. The costs to the economy in countries where HIV/AIDS infection has spread widely are expected to be staggering as significant numbers of infected individuals, most of whom are in the prime of their earning history, leave the labor force. The treatment of AIDS patients is also extremely expensive and many countries, such as the Philippines, will simply be unable to bare these costs as the number of AIDS patients becomes large. The DOH initiated a National AIDS Prevention and Control Program in 1988 which has helped to heighten public awareness of the HIV/AIDS problem. However, these efforts need to be expanded in scope to prevent a major HIV/AIDS epidemic in this country.

2.2 Summary Description of the AIDS Surveillance and Education Project (ASEP)

The AIDS Surveillance and Education Project (ASEP) responds to the need for accurate information on HIV prevalence and helps to expand IEC efforts to encourage behaviors which will slow the spread of HIV infection. ASEP will fund the logistical requirements for establishing a national HIV/AIDS sentinel surveillance system similar to systems operating in other countries. This system constitutes a major component of the National AIDS Prevention and Control Program of the DOH. Blood samples from sentinel groups - i.e., purposely selected individuals who are at high risk of HIV infection due to their personal behavior - will be collected semi-annually to monitor the spread of the disease within these groups.

Initially, two categories of high risk groups will be monitored. In the "A" category are those groups where the disease is most likely to occur first. Intravenous drug users, male patients of sexually transmitted disease clinics, and overseas contract workers were selected for the "A" group. Additional high-risk groups selected for initial testing - the Group "B" - include men who have sex with men, male commercial sex workers and female commercial sex workers. Appropriate methods for identifying and selecting individuals from these groups are being developed. The Operational Plan of the HIV surveillance system can be summarized as follows:

HIV Surveillance Plan

Surveillance Group	Sites	Collection Site	Test Method	Sample Size
A1. Male STD Patients	All	STD Clinics, Private Labs	Anonymous unlinked	300
A2. IV Drug Users	All	Treatment facilities Rehab. Centers	Voluntary anonymous	300
A3. Overseas Contract Workers	Metro Manila	Accredited Laboratories	Anonymous unlinked	300
B1. Male Comm. Sex Workers	All	Establishments	Voluntary anonymous	100
B2. Men who sex with men	All	Gay oriented venues, businesses and associations	Voluntary anonymous	100
B3. Female Comm. Sex Workers	All	Establishments	Voluntary anonymous	300

The maximum number of samples to be taken per group are stated in the preceding table. Access to these individuals will determine the actual number obtained. Approximately a thousand samples per site per round of testing are anticipated. Four sites have been selected for first-round testing; the system will expand to as many as thirty sites nationwide over the next several years. As the epidemic progresses, additional sentinel groups may be added and others deleted.

Blood samples will be taken by trained medical technicians using vacutainers rather than standard needles and syringes. This system is convenient and safe for experienced laboratory technicians who will be using the vacutainers (e.g., blood splatters from opening the vacutainers typically happens to technicians who are inexperienced or have poor laboratory skills). HIV testing will be conducted by regional laboratories supervised by the Bureau of Research and Laboratories (BRL). Blood tests conducted for STD patients and overseas contract workers performed by private clinics will include HIV testing and be used by the surveillance system. Confirmation of positive blood samples will be conducted by the Research Institute of Tropical Medicine (RITM).

At each surveillance site, a "site manager" will be assigned responsibility for the surveillance operations, including identification of locations where samples will be collected, gaining access to sentinel groups, supervision of technicians and laboratory work, to the reporting of results and transport of "positive" samples for confirmatory re-testing. The site managers will be pathologists or the senior medical technicians from the regional laboratory doing the testing. The Operational Plan specifies the division of responsibilities for implementation of the system, including planning, budgeting and logistical support, among central office/agency and field staff.

From experience with the spread of HIV infection in other countries, surveillance data on these sentinel groups will inform decision makers about the spread of the disease in high-risk groups, as well as its spread to the general population. Such information is essential for raising public awareness, encouraging behavioral changes and direct national Information, Education and Communication (IEC) efforts.

The second component of ASEP supports a national IEC program on AIDS prevention. These activities will be targeted on high-risk groups as well as provide information on AIDS prevention for the general public. As information on the progression of the epidemic becomes available, the IEC component will direct its efforts accordingly to those groups and those geographic locations where the disease is spreading most rapidly. The IEC component has no "reasonably foreseeable environmental effect".

2.3 ASEP's Potential Environmental Impact

As the national sentinel surveillance system is established with ASEP's assistance, the volume of medical materials required for blood testing which are potentially contaminated with HIV will increase. For example, if one thousand samples are taken per site every six months, with the projected expansion of the system to a total of thirty sites, some 60,000 contaminated needles will be generated annually by the surveillance system.

Clearly, as the surveillance system expands, the amount of contaminated medical materials generated by the system will correspondingly increase. Given the grave danger that materials potentially contaminated with HIV poses to health workers, waste disposal workers and scavengers at public dump sites, these materials need to be decontaminated to reduce the chances of accidental infection. In short, accidental HIV infection is the principal "reasonably foreseeable environmental effect" of ASEP.

While HIV causes a particularly devastating disease, the virus is easily destroyed by routine methods used for sterilization or decontamination. For example, a 1 minute exposure to 0.5% sodium hypochlorite (1 to 10 dilution of household bleach) inactivates

the virus, as does autoclaving and exposure to dry heat at 170 degrees C.[2,3] Since it is impossible to recognize an HIV carrier without clinical testing, **any blood** may contain HIV, hepatitis B virus, or other dangerous pathogens. All blood samples must be treated with care. What is needed, therefore, is to identify the options for handling these materials, the associated strengths and weaknesses of each alternative and select an approach for each category of materials which is medically effective, environmentally safe, practical, of minimum cost to the project, and requires minimum training and monitoring.

3. INTERNATIONAL STANDARDS AND CURRENT REGULATIONS FOR HANDLING HIV CONTAMINATED MEDICAL MATERIALS

Experience with HIV/AIDS epidemics in other countries has led to issuance of biosafety guidelines for laboratories and other facilities working with HIV contaminated materials. In medical laboratories, the same practices and procedures followed for handling other infectious and toxic materials apply equally to HIV contaminated materials. In fact, any blood contaminated material must be assumed to be potentially HIV infectious.

In this section, examples of biosafety guidelines are presented and briefly discussed. WHO's recently issued standards are a good example of those developed by international health organizations (CDC's guidelines are another). In fact, HIV can be inactivated relatively easily through various procedures to decontaminate materials. Two sets of recently issued regulations - one from the Bureau for Research and Laboratories (BRL), the other from the Metro Manila Authority (MMA) - concerning handling of infectious or toxic medical wastes are presented to illustrate current laboratory standards in the Philippines.

Voluminous, very detailed procedural guidelines have been issued for laboratory operations regarding the handling of contaminated medical materials. These are only referenced in the report to illustrate that such guidelines are in place and that additional guidelines for **laboratory operations** are unnecessary for dealing with the medical materials used for the surveillance system.

As this section illustrates, because HIV can be inactivated in a number of ways, procedures most appropriate for the Philippine context need to be selected for the surveillance system.

3.1 World Health Organization's Standards: "Biosafety Guidelines for Diagnostic and Research Laboratories Working with HIV", WHO AIDS Series No. 9, 1991.

The following procedures were recommended in WHO's recent guidelines for the handling and disposal of contaminated materials and wastes:

" 1. Reusable equipment such as pipette tips, syringes, cannulas, needles and specimen tubes should be placed in a puncture-resistant metal of plastic container at the work station. Such equipment must be chemically disinfected prior to cleaning and then autoclaved or boiled. Gloves must be worn during disinfection and cleaning.

2. Contaminated laboratory gowns, coats and other protective clothing should be placed in a separate container located within the laboratory. Before reuse, such clothing should be autoclaved or disinfected and washed.

3. Disposable contaminated equipment, e.g., syringes, needles and other sharp instruments or objects, should be placed in a puncture resistant metal or plastic container at the work station. This and other contaminated material should preferably be autoclaved, boiled or chemically disinfected in the work area. Alternatively, it may be transported from the work area in a securely covered leak-proof container to a central site on the laboratory premises for immediate autoclaving or incineration. If the containers are to be reused, they should be cleaned and disinfected before reuse.

4. Incineration is the method of choice for disposing of contaminated material and waste if the incinerator is located on laboratory premises and under laboratory control. If the material has to be removed from the premises it must be autoclaved or otherwise disinfected. Institutional-type incinerators (not less than 1300C) should be used; supplementary fuel should always be used to ensure complete combustion. Permission must always be obtained from the appropriate local authorities to operate an incinerator or carry out controlled burning operations. Ashes and debris should be buried in a landfill site.

5. Burial of decontaminated material and waste in a controlled landfill site is the only acceptable option when incineration is impossible or not permitted. Extreme care must be taken to ensure that any materials and waste disposed of in this manner have been sterilized or disinfected and that syringes and needles are destroyed mechanically. The materials should be deposited in trenches, covered with earth and compacted daily. The controlled fill must be fenced off and scavenging strictly prohibited.

6. Radioactive material should not be incinerated. It should be disposed of in accordance with national codes and requirements."

Regarding the applicability of the preceding to the Philippines, several important points to consider are as follows:

- For reusable equipment, the recommended procedure is to chemically disinfect them first, and then autoclave or boil to assure sterilization prior to reuse. Note that needles are included by WHO as reusable equipment. This implies that the chemical disinfectant does not corrode the needles, as sodium hypochlorite does. In turn, this implies using a chemical disinfectant which is more expensive than sodium hypochlorite, which is the cheapest disinfectant.

- In recommendation 3, needles are also included as a disposable item. Disposable materials are chemically disinfected, autoclaved or incinerated. Autoclaving prior to disposal implies that there is sufficient autoclave capacity to be used for items that will be discarded, in addition to those that will be reused. Incineration obviously implies that a facility is available.

- Incineration is "the method of choice" for disposal, using institutional-type incinerators that reach at least 1300°C. Such high temperatures are needed to melt needles; HIV is inactivated at much lower temperatures (170°C). Such facilities are generally not available outside of Manila and those that do exist are reported to not reach 1300°C.

- Burial of materials after decontamination is considered the only option to incineration for disposable items. These materials would be chemically disinfected or autoclaved. Note that needles are to be mechanically destroyed - i.e., cut - before burial to render them worthless (i.e., of no value to scavengers). This implies the availability of needle cutters and requires medical technicians to manipulate a used needle - the major cause of accidental needles sticks to medical personnel.

In general, there is no question that WHO recommends highly effective procedures; however, their appropriateness for current conditions in the Philippines is debatable. The recommendations involve technologies for waste disposal not generally available, i.e., institutional-type incinerators, or more cost, i.e., needle cutters, non-corrosive disinfectants, than possible alternatives.

<u>3.2 Bureau of Research and Laboratory Standards:</u> "Revised Rules and Regulations Governing the Collection, Processing and Provision of Human Blood and the Establishment and Operation of Blood Banks", Bureau Order 5, January 15, 1992.

The following procedures are specified by BRL for safety and sanitation/disposal of infectious or toxic laboratory wastes:

" There shall be written policies, guidelines, procedures for maintenance of sanitation and safety standards and disposal of infectious or toxic laboratory wastes through facilities, such as sewers and incinerators disposal systems or other approved methods for the disposal of contaminated materials and wastes provided for use within the Blood Bank premises.

1. Before disposal, all laboratory specimens or materials consisting of or containing/contaminated with blood, plasma, serum or human/animal tissues, fluids or potentially infective materials must be either:

    1.1. Incinerated or sterilized by autoclaving following the procedures prescribed by the Bureau of Research and Laboratories, or

    1.2. In cases where autoclaving is not feasible, it shall be decontaminated with the use of a chemical disinfectant.

2. All glassswares, pipettes, slides, etc. used in the different activities of blood banking must be autoclaved or chemically disinfected before being discarded or prepared for re-use.

3. Single-use bottles, tubes, vials and other biological specimen containers shall be placed in biohazard containers and decontaminated before disposal and not be placed in waste baskets customarily emptied by the janitorial personnel.

4. Rejected blood products positive for serological screening tests that will be used for research or for purification of viral antigen shall be transported in accordance with the system prescribed by the Bureau of Research and Laboratories.

5. Used needles and syringes shall be discarded into puncture-resistant containers for disposal. Needles should not be re-capped, bent, broken or removed from disposable syringes after use."

Points of comparison between BRL's regulations and WHO's recommendations to consider are as follows:

- BRL's regulations for the disposal of contaminated materials follows WHO's preference for incineration with chemical disinfectants as an alternative prior to disposal. However, no temperature requirements are specified.

- For BRL, reusable equipment is either autoclaved or chemically disinfected (point 2), whereas WHO recommends both actions.

- BRL specifies the use of biohazard containers and the rules governing the handling of these materials (point 3), whereas WHO recommendations imply no such system exists.

- BRL specifically states (point 5) that needles are not to be manipulated in any way after use, as opposed to WHO which recommends mechanically destroying them. However, BRL does not specify whether the containers in which needles are deposited for disposal contain a chemical disinfectant.

In comparison to WHO standards, BRL regulations require "either/or" procedures, i.e., incinerate, autoclave or chemically disinfect, reducing manipulation of contaminated materials and not relying on institutional-type incineration. BRL's regulations, therefore, appear somewhat better attuned to prevailing conditions in the Philippines.

3.3 Metro Manila Authority Standards: "Regulating the Management of Hospital Waste and those of Similar Institutions in Metropolitan Manila", Guidance No. 16, 1991.

MMA issued these regulations in light of the following observed problems regarding medical waste management:

- Several studies found that the majority of more than 172 hospitals are disposing their infectious, potentially infectious and radioactive solid and liquid wastes without proper disinfection and treatment, through Metro Manila's collection systems which are the open dumps, and/or through the hospitals' plumbing system into septic tanks or sewerage facilities;

- Few hospitals burn their wastes and those that do incinerate produce air pollution; and

- "Sharps" are thrown away with the general wastes, burned, buried, stored or sold for recycling in ways which endanger hospital personnel, garbage collectors and scavengers.

MMA's regulations require the use of color-coded trash bags, with matching colored containers, for hospital waste classified as follows:

- **Black:** for non-infectious dry waste;

- **Green:** for non-infectious wet waste;

- **Yellow:** for collection of dry and wet: a) chemical waste and other potentially infectious waste, b) pathological waste, c) other chemical waste and d) sharps contained in puncture-proof containers covered with thick solution of lime;

- **Orange:** for radioactive waste which will be stored in the hospital until rendered as inactive and/or disposed of in accordance with prescribed rules and regulations of the Philippine Nuclear Research Institute.

Specific regulations regarding hospital waste and garbage disposal are as follows:

" 1. Hospital Incinerator System - Requires smoke or exhaust airscrubbers with high pressure diesel fuel fired at a burning capability of 1000°C temperature. This will handle waste in **yellow** trash bags and may be used for waste in black and green bags.

2. Hospital Enclosed Burning Pit - Requires a smoke stack and located 50 to 100 meters from the hospital facility. Ideal for hospitals with open spaces and away from nearby buildings. The wind direction is studied. The location of the pit must a be a place where the wind blows the smoke away from the hospital facilities. The ashes of left-over burnt material are thrown in the public dump site. This will handle hospital waste in **yellow** trash bags.

3. Ground Pits - This is a dug ground hole about 2 meters deep and 1 meter wide located at a safe distance from the hospital facilities. This can be used for "sharps", clinical wastes and pathological wastes. The wastes are covered by lime and 10 cm. of soil periodically or daily. When the pit is 10 cm. from being filled, it is covered by soil to ground level and labelled as to the date. The pit is kept closed for at least four months if it is to be reused. Hospitals using this system should have at least three or four such pits used on a rotational schedule.

4. Sewerage Disposal System - For urine and fecal material in cases of typhoid, infectious diarrhea, poliomyelitis and infectious hepatitis, the technique for handling is dependent upon available sewerage disposal facilities..."

The following points are worth considering in comparing these regulations with WHO and BRL:

- The temperature specified for incineration is 300°C less than WHO standards. This is certainly sufficient to inactivate HIV, but perhaps insufficient to destroy used needles.

- Burning pits with smoke stacks are likely to be a source of air pollution, especially if wet materials are included. Again, HIV would be inactivated but sharps would not be destroyed. Ashes containing sharps would be deposited in public dump sites.

- Burial of wastes might also pose a potential environmental problem if the amount of materials is large, or if it contains hazardous liquid wastes which could pollute ground water.

3.4 Laboratory Procedural Guidelines for Infectious Materials

The standards and regulations cited in Section 3 concerning handling of infectious and toxic medical wastes focus on the disposal or decontamination to medical materials. Regarding the handling of these materials **in the laboratory**, voluminous, very detailed operational procedures have been produced for the country's major laboratories working with infectious materials. As noted earlier, HIV contaminated materials are handled like any other infectious material. There is simply no shortage or inadequacy of laboratory procedural guidelines concerning the handling of infectious materials **in the laboratories** which will do the testing for the surveillance system. Annex 1 provides references illustrating examples of such procedural guidelines. In short, ample laboratory guidelines for handling infectious materials, which includes HIV contaminated materials, have already been issued. The EA team concluded that additional guidance is not needed nor would it assure that contaminated materials from the surveillance system are properly handled.

3.5 Conclusions

The preceding regulations and standards illustrate that there is no single procedure for assuring safe handling contaminated medical materials. In general, incineration of disposable items is the preferred method, but chemical disinfection and/or autoclaving are also acceptable. Chemical disinfection and/or autoclaving are the recommended methods for materials that will be reused. In short, these regulations and standards indicate that there are options for selecting effective yet appropriate procedures for handling medical materials used for the surveillance system. Laboratory guidelines for handling infectious materials already exist and apply to HIV contaminated materials; additional guidelines are not needed.

4. CURRENT HOSPITAL AND LABORATORY PRACTICES OF MEDICAL WASTE MANAGEMENT

The handling of medical materials used for the surveillance system occurs at three major points: a) at the collection site were samples are obtained by medical technicians, b) in the laboratory where the testing is done and c) in the hospital's waste management system (i.e., after the testing is completed). One possibility for the surveillance system might be to rely on the waste management systems of the laboratories and hospitals where the testing is done for proper handling of its used medical materials. If that is possible, then the focus of concern is at the collection site, which can be more easily controlled by the project. The EA team investigated this possibility.

This section reports the findings of the EA team's investigation of current practices of regional hospitals and laboratories. These facilities will conduct the HIV testing for the sentinel surveillance system. The EA team met with the Regional Hospital directors who explained the procedures the facility follows for handling of contaminated medical materials. The team visited the laboratories to observe how these materials are actually handled, from initial use to decontamination and/or disposal. The team checked trash cans in laboratories to see if used medical materials are indeed properly handled. The team talked to janitors and other personnel who handle waste from the hospital to learn what medical materials they regularly find in the trash. Burning and dump sites were visited to see first hand what medical materials were discarded there.

In general, the team found considerable disparity between official procedures and actual practices in handling these materials. In general, the team concluded that waste management systems of the hospitals where testing will be done are inadequate or too unreliable to assure proper handling of the medical materials used for the surveillance system.

4.1 Laboratory Handling of Infectious Medical Materials During Testing

The question of proper handling of medical materials used for the surveillance at the testing laboratories can be divided into two stages: the laboratory work required for HIV testing and the subsequent disposal and decontamination of materials after the testing. As noted earlier, HIV contaminated materials are handled the same as any other infectious or toxic medical material. The techniques and procedures laboratory technicians are trained to follow are focused on personal safety to avoid accidental infection. Laboratory technicians in the Philippines are typically well trained. The infectious disease specialist working on this EA has considerable experience with the procedures followed in the major laboratories in the Philippines. In his judgement, laboratory technicians are meticulous in their work. For example, they generally avoid dangerous practices, such as pipetting by mouth; they wear rubber gloves when handling infectious materials, and they carefully avoid splatters or slashes when working with blood samples. In short, the laboratory "testing" phase is not problematic from the perspective of proper handling of contaminated medical materials.

However, after testing is completed, improper disposal of materials observed by the EA team, in part, results from the technicians' same meticulousness. For example, technicians will throw used needles in the regular trash for disposal immediately after use to protect themselves from accidental infection which might result from decontaminating these materials. In short, the improper handling of contaminated materials seems to reflect the

technician's top priority of avoiding personal accidental infection; what happens after they are done with the materials is of less concern to them. In other words, the environmental hazard of improper medical waste management arises **after laboratory procedures** are completed.

4.2 Hospital Waste Management Practices

During the course of our interviews, individuals knowledgeable about the disposal of medical wastes in both public and private hospitals readily acknowledged that existing regulations and guidelines are frequently not followed in actual practice. The EA team's observations and preliminary conclusions about the inadequacy of these systems was strongly confirmed by participants attending the Scoping Session knowledgeable about hospital waste management practices.

Examples from several medical facilities visited are as follows:

- **Philippine General Hospital:** Sharps (used needles, scalpels, etc.) are collected in large tin cans and buried on hospital grounds. Glassware from laboratories is autoclaved and reused. Disposable material soiled with blood is burned in a large incinerator behind the hospital. Temperatures are not measured in the incinerator, but they are far below the ~1300 C recommended by WHO for complete incineration of needles. Neighbors have complained about the smoke from the incinerators.

- **Research Institute for Tropical Medicine:** Sharps are collected in metal or plastic containers and buried near the hospital. Although the incinerator is designed to reach higher temperatures, it does not melt needles. Attempts to incinerate them produced a dangerous mixture of ash and sharp metal fragments.

- **Regional Hospitals:** Zamboanga, Davao, Tacloban, and Iloilo Regional Hospitals were visited. In a typical ward, needles are either thrown in the regular trash or placed in a cloth "book" on the ward. In the latter case, the needles are sent to Central Supply where they are autoclaved for reuse. All other waste (including sharp material contaminated with blood) goes in the regular trash. In the Contagious Diseases Wards, the needles were collected in plastic bottles and later buried on hospital grounds. In the laboratory, waste from the Microbiology Lab is autoclaved before disposal. Other waste goes into the regular trash. Trash is picked up by the city and dumped in a landfill.

Davao was an exception to this in that most blood-contaminated waste from the laboratory was put in a high temperature electric incinerator, which was said to reach over 1,000 C. In Iloilo, needles from the blood-drawing section of the laboratory were routinely dropped in shallow basins of sodium hypochlorite to

decontaminate them before disposal. All hospitals had functioning autoclaves though autoclave capacity/time is limited.

In contrast, the team learned of instances where used needles and syringes are dropped in a plastic bag with the instructions to those disposing of such bags "to be careful". Contaminated needles being dumped in landfills and public dump sites pose dangers for those waste disposal personnel who handle these materials from the laboratory to the dump site. Scavenging for needles is common in the Philippines. Scavengers squeeze plastic bags to feel for sharp objects. Consequently, they are frequently stuck by needles. If they encounter needles which are HIV contaminated, they obviously risk accidental infection.

During the Scoping Session, it was noted that in Metro Manila there is an over-capacity for incineration of medical materials among some major hospitals. Three major hospitals within blocks of each other have incinerators, though it was believed that they do not reach 1300°C. A possibility for improving overall medical waste management might be to organize groups of hospitals who would use these facilities jointly, or to organize hospitals to share the costs of purchasing institutional-type incinerators. However, this is not a viable short-term option for the surveillance system; i.e., procedures are needed immediately that can be applied at all surveillance sites.

4.3 Conclusions

The system used in the regional hospitals, where HIV testing will be done for the sentinel surveillance system, is inadequate and/or too unreliable to assure safe and proper handling of medical materials used for the surveillance system. The deficiencies in these systems do not provide adequate or regular protection for hospital personnel, waste disposal workers, or scavengers who pick through the landfills. HIV does not penetrate intact skin, but may gain entry to the body through small cuts. It is important to note that medical personnel are often exposed to dangerous infectious agents while disposing of sharp instruments. The commonest cause of accidental needle sticks are recapping needles prior to disposal. To avoid exposure of personnel to blood potentially containing HIV, it is important to segregate waste contaminated with blood and to assure inactivation of the virus.

Proper management of contaminated materials needs to be established as part of the surveillance system. As described in the following section, before each round of blood collection and testing, preparatory meetings are held between the local site manager and the central office staff to discuss their work plans. The guidelines and safety procedures for dealing with and disposing of potentially infectious waste generated by the surveillance system will be an integral part of the Manual of

Operations for the HIV/AIDS surveillance program. To ensure compliance and strict adherence, the guidelines will be reviewed and emphasized during the briefing/orientation workshop for the various participants in each site prior to the actual surveillance. Guidelines for supervisors will include instructions to assure that proper waste handling procedures are being followed.

5.1 General Strategy for Identifying and Comparing Options.

The purpose of the Environmental Assessment is to develop effective, practical procedures to assure that medical materials used for the HIV Sentinel Surveillance System funded will not transmit infection to hospital workers, waste disposal personnel, scavengers, or others who may come in contact with the waste.

HIV is spread through infected body fluids. Because HIV surveillance requires drawing blood, the primary risk factor is blood or materials contaminated with blood. Sharp objects, like needles, represent a particular hazard, since they may break the skin and inject the virus. Therefore, all materials contaminated with blood must be disinfected as quickly as possible. If it must be stored before decontamination, the material must be clearly marked so that there is no danger that it will be mixed with other trash. After the material has been decontaminated, it may be disposed of as normal waste or reused.

The medical materials that will be contaminated for use in the surveillance system consist of three main types: a) **sharps** (i.e., needles, lancets); b) **combustibles** (i.e., rubber gloves and paper); and c) **non-combustibles** (i.e., the glass tubes used in vacutainer system, pipettes). Procedures for handling each type of material are needed.

During the EA Scoping Session, participants agreed that the following criteria should be used to compare options for handling these materials:

- **medical effectiveness**: how effective is the procedure in inactivating HIV;

- **environmental safety**: to what extent does the procedure produce subsequent effects on the environment (e.g., air pollution from burning);

- **practicality**: is the procedure familiar to medical technicians and is it fairly simple to do;

- **cost**: what are the cost requirements of the procedure; and

- **training and monitoring requirements**: how much staff training is needed for the procedure and what are the monitoring requirements to assure compliance.

Scoping Session participants also agreed that the preceding order of the criteria reflects their relative importance in selecting among the options, e.g., medical effectiveness and environmental safety are most important, training and monitoring requirements are least important.

Options were developed for each of the three categories of medical materials taking into account the various recommendations and standards discussed presented in Section 3 and common medical practices for handling contaminated infectious materials. The following section describes these options, notes their major advantages and disadvantages and compares them on the basis of the five preceding criteria.

5.2 Options for Managing Used Materials

5.2.1 Sharps

The handling of sharps is the major concern because they can puncture skin, possibly resulting in HIV infection. There was a broad consensus that sterilization and reuse of needles as an option was simply an unacceptable option. Reuse requires manipulation by technicians, increasing the possibility for accidental needle pricks. The potential for mishandling and abuse of reusing needles was considered too great; therefore, it is not a viable option. Disposal of blood samples is not problematic. Pouring the samples down the sink and, when work is completed, decontaminating the sink with sodium hypochlorite is medically safe and not environmentally harmful. The bacteria in sewers and septic systems quickly inactivate HIV.

A. Sterilize and Discard After Use

At each collection site, there would be a metal or puncture-proof plastic container (e.g., a one liter powdered milk can) filled with a fresh solution of sodium hypochlorite. The top of the container would have a hole only large enough to admit needles. (Note: the "syringe" part of the vacutainer system is a glass test tube which would be transported in a sturdy rack to the laboratory where the testing is performed.) As soon as the sample is collected, the needle would be deposited in the container (Note: the opening in the can could be cut in a shape to facilitate removing the needle from the vacutainer or a hemostat could be used to disconnect it. Under no circumstances would needles be recapped.) When the container is full, or when work at the sites is completed, it will be taken to the Regional Hospital and buried under at least 5 cm. of soil. The burial

site must be on the hospital grounds where the material is inaccessible to scavengers.

- **Advantages:** The major advantages of this approach are: it is relatively inexpensive, straightforward to implement and minimizes handling of sharp materials, thereby reducing the danger of accidental needle pricks to personnel. The needles would be sterilized and the sodium hypochlorite would corrode the needles. Thus, if scavengers were to gain access to the containers, the needles would be useless. It is also very practical because it uses locally available supplies and the procedure is fairly simple to perform. The volume of sodium hypochlorite (e.g., one liter) is too small to harm the environment after burial.

- **Disadvantages:** Technicians collecting blood samples would have be equipped with a container with fresh sodium hypochlorite. This requires some logistical support. Similarly, delivery of containers and their burial in a dedicated site on the hospital grounds would require supervision.

B. **Destroy after Use with Needle Cutters**

At each collection site, there would be a commercially-available plastic box with a needle cutter. After use, each needle would be inserted into the cutter and destroyed. When the box is full, it would be disposed of burying as in alternative A.

- **Advantages:** The major advantage is that needles cannot be reused even if scavengers dig them up.

- **Disadvantages:** Medical personnel may be injured manipulating needles (for example if they miss the hole in the cutter and press the needle in, it may bend sideways and scratch them). The cutter boxes are expensive and have to be imported. Also the cutters pressure on the vacutainers might cause them to wear out faster.

C. **Incinerate Sharps**

Needles will be collected in plastic puncture-proof containers and then brought to an incinerator and burned at 1300 degrees C.

- **Advantages:** Needles are totally destroyed and cannot injure anyone.

- **Disadvantages:** As noted earlier, institutional incinerators as recommended by WHO are not widely available. Trying to organize the collection of used needles for incineration at facilities which might reach 1300°C poses logistical and supervisory

problems (e.g., containers are not regularly collected, they break during transit exposing people to their contents, they simply accumulate somewhere, scavengers gain access to them, etc.). It would costs tens of thousands of dollars to build and run incinerators at the sites. In short, incineration is simply not practical at this time for dealing with used needles from the surveillance system.

The options for handling sharps were scored as follows by the Scoping Session participants:

(Scores: 1 -lowest; 5 - highest, note cost scores are reversed, i.e., high cost is a low score; * - best option)

Sharps

Option	Medically Effective	Environ. Safety	Practical	Cost	Training/ Monitoring
Discard *	5	4	5	5	5
Destroy	5	4	1	3	2
Incinerate	5	5	2	1	1

5.2.2 Combustibles (gloves and paper contaminated with blood)

A. Destroy After Use

One approach is to supply each collection site with a yellow biohazard bag. All non-sharp combustible materials would be placed in the bags after use. When they are full, the tops would be sealed and then brought to the Regional Hospital where they would be burned.

- Advantages: This approach requires no staff training and minimum supervision.

- Disadvantages: Gloves which are not damaged would not be reused, increasing costs unnecessarily. Personnel could be exposed to contaminated materials if the biohazard bags are punctured in transit. Burning rubber gloves in open pits produces smoke.

B. Discard After Autoclaving

An alternative approach is to use the biohazard bags which would be autoclaved after use. This would kill all microorganisms and bags could then be discarded with the regular trash.

- **Advantages:** The major advantage of this approach is that it would be easy to train staff to follow this procedure. It may produce less environment effects if the bags are taken to a dump site as opposed to burning in the open air.

- **Disadvantages:** This approach would be comparatively more expensive because it involves discarding gloves which could be reused. Moreover, it uses valuable autoclave time, which is limited in most regional hospitals and laboratories, for materials that will be not be used again.

C. **Autoclave Gloves and Reuse**

Paper would be handled as in alternative A, using biohazard bags which are destroyed. After using the gloves, the technician would wash them (while still wearing them) to remove any visible blood. Gloves with visible tears or weak spots would be discarded, using biohazard bags that are destroyed. Those that can be reused would be dried, wrapped in autoclave paper, and sent for autoclaving.

- **Advantages:** The major advantage of reuse is that it reduces costs by reusing rubber gloves. Medical personnel typically reuse gloves following the same procedure, so they would be familiar with this approach. Reuse has no effect on the environment.

- **Disadvantages:** Reuse is simply more complex than disposing of all used gloves, i.e., they have be washed and autoclaved. Autoclave time would be required and some supervision to assure proper handling.

The Scoping Session participants scored these options as follows:

Combustibles

Option	Medically Effective	Environ. Safety	Practical	Cost	Training/ Monitoring
Destroy - burn	5	2	3	2	4
Discard - autoclave	5	3	3	3	4
Autoclave/ Reuse *	5	5	5	4	4

(For autoclave/reuse, paper and damaged gloves would be deposited in biohazard bags which are destroyed by burning at the regional laboratory.)

5.2.3 Non-combustibles (test tubes, pipettes)

A. **Discard After Use**

In each collection area or laboratory, a biohazard bag would be set aside for non-combustible materials. It would be a different color then the bag for combustibles. When full, the bag would be sealed and autoclaved. It may then be discarded as regular trash.

- **Advantages:** This approach would be simple, easy to teach and supervise.

- **Disadvantages:** This approach requires autoclave time for materials that would not be reused. It also is relatively expensive because reusable materials would be discarded unnecessarily.

B. **Reuse**

A pan containing hypochlorite solution would be placed at the laboratory workbench. The hypochlorite solution would be mixed fresh each morning from a stock solution. After use, test tubes and other materials would be dropped into the pan. At the end of the day, the hypochlorite can be discarded and the tubes can be washed with soap and water prior to reuse. If materials need to be sterilized, they would be autoclaved after washing and prior to reuse.

- **Advantages:** The major advantage of reuse is that it is economical in that it avoids unnecessarily discarding laboratory materials. It also does not use autoclave time unnecessarily.

- **Disadvantages:** Glassware will have to be decontaminated which is more laborious than simply throwing it away.
The Scoping Session participants scored the options as follows:

Non-Combustibles

Option	Medically Effective	Environ. Safety	Practical	Cost	Training/ Monitoring
Discard	5	3	3	1	5
Autoclave/ Reuse *	5	5	5	5	3

5.3 Procedural Recommendations

Based on the preceding review of options, the following procedures are recommended for handling used materials from the surveillance system:

- The general strategy to be followed is to initiate decontamination of materials by the technical staff involved with blood collection and by the medical technicians conducting the testing prior to the release of these materials for subsequent processing through the hospitals' established procedures.

- Needles used with vacutainers will be deposited in a puncture-proof container (e.g., powdered milk containers) which contains a fresh solution of sodium hypochlorite. These containers will have a small slit or opening cut in them large enough to allow depositing of the needle immediately after use. The medical technician collecting the blood samples will bring a can containing the solution to the collection site. These cans will be delivered to the Regional Hospital/Laboratory where they will be buried in the hospital grounds at a "dedicated site" for this purpose to prevent scavenging.

Surveillance will be undertaken in 30 different sites and each site will dispose of its own waste. Each site is projected to use a maximum of 2,000 needles per round of surveillance. The needles will be placed in 1 liter cans. If we assume that each can contains 200 needles, then 10 cans will be generated per round, or 20 cans per year. These cans will occupy a volume of 0.02 cubic meters, or 0.1 cubic meters over the 5 year life of the project. There is adequate space at each of the sites chosen for the first round of surveillance. One of the criteria for future sites will be that adequate space for disposal of needles is available.

The issue of the environmental effects of burying substantial volume of sodium hypochlorite (bleach) was discussed during the Scoping Session. It was pointed out that approximately half the volume of each can will be occupied by needles and the other half by disinfectant. Therefore, each site will bury about 10 liters of 0.5% sodium hypochlorite per year. This will result in burying the equivalent of 1 liter of household bleach diluted in 10 liters of water per year at each site.

The representative to the Scoping Session of the Environment Management Bureau of the Department of Environment and Natural Resources determined that the volume of sodium hypochlorite that will be buried during the entire period of the surveillance program will not cause a significant negative impact on the environment. The sodium hypochlorite

will leach out into the soil. There will be initial reaction with components of the soil leading to formation of salts. However, the mixture will be gradually washed out by rainwater. If this mixture eventually reaches the water table, it will have been diluted and it will have minimal, if any, impact. There may be some adverse impact on the soil in the burial site, since higher concentrations of sodium hypochlorite will exist there.

The guidelines will specify that the burial sites should be located more than 10 meters from any water pipe or water source to assure that there is no contamination of water supplies.

- The vacutainer system will be used to collect blood samples. Blood-filled vacutainers held in sturdy racks will be transported in leak-proof containers lined by an absorbent pad. The estimated amount needed to provide all 30 sites with leak-proof containers is US$9,000 and will be provided under the project. The containers are safe and easy to use by experienced laboratory technicians. Blood samples, i.e., the blood clots resulting from testing, can be safely disposed of by pouring them down the sink and decontaminating the sink with sodium hypochlorite. Therefore, no recommendations are needed for blood sample transport, use or disposal.

- Rubber gloves which can be reused will be washed, and then autoclaved. Contaminated paper and gloves which are punctured, torn or in some way unusable will be deposited in a color-coded biohazard bag and then disposed of along with other the hospital wastes (i.e., burning).

- Test tubes, pipettes and other glassware which can be reused will be washed, decontaminated with sodium hypochlorite and then autoclaved if sterilization is necessary. If glassware that may have been contaminated with HIV breaks, the procedure will be to pour 1% hypochlorite solution on it and leave it in place for 10 minutes. Then it will be place in biohazard bags inside puncture proof containers. Hard-sided containers will be provided to each sentinel site through project funds. The estimated amount needed to provide all 30 sites with hard-sided containers is US$900. Guidelines will specify that biohazard bags be filled and transported in hard-sided containers.

To incorporate these procedures into the Operational Plan for HIV surveillance, the following recommendations are made:

- As part of the preparatory training sessions conducted prior to field work, these procedures will be reviewed with technicians involved with blood sample collection and HIV testing. Additional or special training or laboratory procedures are not

necessary for the following reasons: a) the individuals involved with the surveillance system are well trained and experienced laboratory technicians, b) the medical materials potentially contaminated with HIV are handled the same way as those used for other medical purposes and c) the existing procedures regional laboratories follow for handling bio-hazardous, infectious or toxic materials are adequate for HIV.

- Responsibility for assuring these procedures are followed will be assigned to the Surveillance Site Managers, typically a pathologist from the testing laboratory or senior medical technician. The Site Manager, therefore, will be the principal monitor of proper handling of used materials. This includes assuring that the technicians have proper containers for needles, that a fresh sodium hypochlorite solution has been prepared and that cans containing used needles are properly buried on hospital grounds. BRL and RITM staff responsible for the national surveillance system will periodically check on adherence to these procedures as part of their regular site visits (e.g., inspecting the "dedicated" burial site, checking in trash cans at the laboratory, spot checks at blood collection sites).

- These procedures and responsibilities will be specified in the Operational Plan for the National HIV Surveillance System.

- The costs of these procedures are negligible and can be absorbed by the budgets of the laboratories (e.g., one liter powdered milk cans with sodium hypochlorite solution). ASEP funding will cover all other supplies (i.e., vacutainers, hard-sided containers, additional gloves and sodium hypochlorite solution, leak-proof containers, the particle agglutination test kits).

6. PROJECT ALTERNATIVES

HIV/AIDS infection can only be determined through clinical blood tests. This requires obtaining blood samples which produce potentially hazardous contaminated medical materials required for the blood testing. There simply is no alternative method for HIV/AIDS testing. The only way to monitor the spread of the HIV/AIDS epidemic that is epidemiologically useful is through a national sentinel surveillance system. This system requires periodic blood samples from sentinel groups (explained above in Section 2.2). In short, there is simply no alternative method to monitor the spread of HIV/AIDS infection.

The alternative of not establishing a national surveillance is not viable. The current lack of accurate information on the prevalence and spread of the disease is a major contributing factor to the development of the epidemic. As described in

Section 2.1, this information is critical to mobilizing prevention and control activities within high-risk groups and the general population. In short, there is no alternative to be considered - the costs of inaction at this point are enormous, whether measured in economic terms or by human welfare standards. Selecting alternative sentinel surveillance sites is also an irrelevant consideration - the same medical materials are used and contaminated irrespective of the location where the samples are taken. The generation of contaminated medical materials and the potential threat they pose for accidental infection are simply trivial in comparison to the costs of inaction.

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ANNEX 3: References and Individuals Contacted in Regional Hospitals

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Individuals Contacted at the Regional Laboratories:

Davao Medical Center:
- Chief of Hospital - Dr. Gerardo Cunanan
- Chief of Laboratory - Dr. Oscar Grogada and Dr. Paraan

Western Visayas Medical Center:
- Chief of Hospital - Dr. Rafeal C. Omega, Jr.
- Chief of Laboratory - Dr. Flora dela Pena

Eastern Visayas Medical Center:
- Chief of Hospital - Dr. Alicia Saidana
- Chief of Laboratory - Dr. Arturo Aldena

Zamboanga Regional Hospital:
- Chief of Hospital - Dr. Leoncia Noche
- Chief of Laboratory - Dr. Myrna Palahuddin

Research Institute of Tropical Medicine:
- Chief of Hospital - Dr. Mediadora Saniel
- Chief of Laboratory - Dr. Noel Miranda

ANNEX 4 **Individuals Attending the October 23, 1992 Scoping Session for the ASEP Environmental Assessment**

	NAME	ORGANIZATION
1.	Jocelyn P. Merin	R I T M
2.	Norma N. Chang	PAMET
3.	Pacita L. Zara	PCHRD/DOST
4.	Mark White	F E T P
5.	Manuel M. Dayrit	F E T P
6.	Alberto Gabriel	PSMUD
7.	Enrique A. Tayag	FETP/SLH
8.	Felilia M. White	FETP/NESSS
9.	Criselda G. Abesamis	BRL/DOH
10.	Edna G. Sauling	S L H
11.	Rosalina L. Cuenca	S L H
12.	Noel Miranda	R I T M
13.	Luis M. Ferrer	D O H
14.	Rosendo R. Capul	USAID
15.	Tricia Moser	USAID
16.	Dr. Kevin A. Rushing	USAID
17.	Irene Finacier-Fellizar	Kabalikat
18.	Teresita Marie P. Bagasao	Kabalikat
19.	Jomar Fleras	Reach Out
20.	Tita G. Fleras	Reach Out
21.	Marilyn R. Atienza	PAMET
22.	Roberto O. Domingo, M.D.	Jose Reyes Mem. Med. Center
23.	Wilfredo S. Asoy, M.D.	EHS/DOH
24.	Primitivo D. Chua, M.D.	Phil. Medical Association
25.	Raul G. Fores, M.D.	Makati Medical Center
26.	Carmina Aquino	USAID
27.	Ricky Hernandez	D O H
28.	Angie Brabante	EMB/DENR
29.	Carmencita Reodica	DOH
30.	Dr. Erese	BRL/DOH
31.	Bill Hollis	HAIN
32.	Michio Venus Adarayan	EMB/DENR

Annex 5: Brief Biographical Sketches of Report Authors

Mark White: Dr. White is the Resident Advisor of the Field Epidemiology Training Program of the Department of Health through a contract with the U.S. Centers for Diseases Control. Dr. White received his MD degree from University of Michigan in 1973. He completed his internship and residency at University Hospital in Ann Arbor, Michigan and an infectious diseases fellowship at the Peter Bent Brigham Hospital in Boston. Dr. White completed Epidemic Intelligence Service training at the Centers for Disease Control in 1977. He is a diplomate of the American Board of Internal Medicine in both Internal Medicine and Infectious Diseases and a member of Phi Beta Kappa and fellow of the American College of Preventive Medicine.

Relevant experience includes work as a general epidemiologist for 2 years in Arkansas, 5 years as Medical Officer with the Plague Branch of the Vector Borne Diseases Division, CDC; 5 years as head of the Infectious Diseases Department at Booth Memorial Medical Center in New York City, Assistant Professor of Microbiology at the City University of New York, Assistant Adjunct Professor of Internal Medicine at New York University.

Dr. White was Hospital Epidemiologist and Chairman of the Infection Control Committee at a 500-bed general hospital in New York City and wrote guidelines for infection control there, including guidelines for dealing with HIV. He also wrote guidelines for HIV prevention for the New York State Funeral Directors Association.

He has published in **The Morbidity and Mortality Weekly Report**, the **Lancet**, and **Bulletin of the World Health Organization**. He has also published an article on HIV epidemiology in the **Journal of the Philippine Medical Association** and has presented papers on HIV at international meetings.

As a Resident Advisor to the FETP for the past five years, Dr. White is familiar with medical care in the Philippines. He presently teaches Hospital Infection Control at Philippine General Hospital and is the vice president of the Philippine Society of Epidemiology.

Chris Hermann: Dr. Hermann has worked for USAID since 1981 in various assignments involving strategy development, program planning, project design and monitoring and evaluation. His experience with USAID covers a wide range of sectors and various modes of assistance in some twenty countries worldwide. He has served as team leader for a variety of technical assistance assignments. Over the past several years, he has worked on numerous assignments in the Philippines with various GOP agencies, including the Department of Health. His involvement with the AIDS Education and Prevention Project began with serving as team leader for the design of the project paper in 1992.