



FAROF ENVIRONMENTAL COMPLIANCE GUIDELINE

Draft Environmental Mitigation and Monitoring Plan;

This plan will support community initiatives and advocacy responding to common interests, ranging from community development, health, education and, violence and exploitation programmes in a safe environment and strengthen both community and organizational capacity, while complimenting Nigeria Government efforts to address reform and development challenges in the country.

FAROF will design or work and adopt Grantors environmental compliance requested, ensuring Donors programme objectives are accomplished with technical assistance supported by a flexible, scalable and responsive grants mechanism, delivering both financial and/or in-kind assistance to community and other stakeholders engagement across all USAID/Nigeria development objectives.

Sub Grants will be awarded to CBOS/CSOs and/or Learning institute and other private sector for a wide variety of activities that may include various community outreach activities relative to community, public and or CSO capacity buildings, conflict Management, joint livelihood, or improved quality health and literacy and numeracy services for marginalized groups. Other newly initiatives that address similar nature beyond those listed here are also possible over the duration of the program. It is also anticipated that through various grant projects procurement of electronic equipment including computers, electronic devices may take place.

All of these activities will require screening, monitoring and application of various mitigation measures. Community members at target communities will be trained by programme Team as Monitoring officer/Data Duality Assurance Team, Demand Creators, Change Agents and role model and to conduct environmental due diligence using the Environmental Review and Assessment Checklist (Appendix I), to screen projects, and to develop an Environmental Manual (EM) and Framework Environmental Mitigation and Monitoring Plan (FEMMP – Appendix III) to monitor applicable project activities.

The following table describes anticipated [FAROF-USAID-CIPP](#) activities, their potential effect on the environment and steps that will be taken to mitigate any negative effects.

Table 1: Illustrative Program Activities, Environmental Effects and Mitigation Measures.

No.	Anticipated Activities	Effect on Natural or Physical Environment	Illustrative Mitigation Measures
a	<p>Program activities expected to have no effect on the natural or physical environment include: Sports, dialogue meetings</p> <p>Joint Livelihood, technical assistance, capacity building activities except to the extent such programs include activities directly affecting the environment (such as construction of facilities, etc.); consultations, participant training, document transfers and information dissemination, analysis, studies, conferences, workshops, curriculum development, working with training programs, outreach, and developing information networks.</p>	<p>Improperly conducted joint livelihood, and No environmental impacts are expected from other listed activities.</p>	<p>For each type of these activities FAROF will conduct Environmental Due Diligence, including completing the Environmental Review and Assessment Checklist (Appendix I) to document existing environmental concerns and foreseeable environmental effects resulting from the activity. No additional actions required/Categorical Exclusion.</p>

b	<p>All activities for which no significant adverse effects are expected include:</p> <p>Procurement of computers, and other office electric and electronic equipment, commodities and materials (no bio-hazardous or low-radiological materials will be used under any activity funded by the USAID CIPP).</p>	<p>Insignificant effect. Obsolete computers are a valuable source for secondary raw materials, if treated properly. However if not treated properly they are a major source of toxic and carcinogenic substances, such as dioxins, Polychlorinated Biphenyl (PCBs), cadmium, chromium, radioactive isotopes, and mercury.</p>	<p>The project will ensure that equipment is used in an environmentally sound and safe manner and properly disposed of at the end of its useful life in a manner consistent with best management practices according to U.S or equivalent standards acceptable to USAID. In order to provide information on best management practices to sub-recipients, FAROF will: 1) approach the vendor regarding their corporate policies on how to collect and where to dispose/recycle certain products and these should be consistent with the aforementioned standards and directives; 2) if a vendor does not have capacity to collect and dispose the equipment, then FAROF will approach relevant national authorities, (i.e. the Ministry of Environment) to seek their guidance on how this can be accomplished in accordance with the law. FAROF will also</p>
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			ascertain where certified waste recycling/processing companies with capacity to deal with certain types of equipment may be found in the country.
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c	<p>Activities that normally do not have a significant effect on the environment if special mitigation measures are specified to prevent unintended impact include: sconflict policy reform, Land use for grazing(range),awareness programmes and Other activities beyond those listed above are also possible over the duration of the program.</p>	<p>Potential for a significant adverse effect of one or more activities. construction activities may result in a wide variety of negative environmental and cultural effects. Site selection for range setup, particularly for new geographical location, is sensitive and may result in loss of places with historical and cultural importance, damage to sources of water, damage to forests, and damage to agricultural lands and natural reserves. Improper site selection may also place buildings – even merely rehabilitated structures – in flood zones or locations at particular risk for landslides.</p>	<p>For each type of these activities FAROF will conduct Environmental Due Diligence, including completing the Environmental Review and Assessment Checklist (Appendix I) to document existing environmental concerns and foreseeable environmental effects resulting from the activity and develop an Environmental Manual (EM) and Framework Environmental Mitigation and Monitoring Plan (FEMMP – Appendix III) when applicable for the specific project. This EM and FEMMP will then be approved by the USAID/Nigeria Mission Environment Officer and incorporated into the project design.</p>
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FAROF Environmental Review Procedures:

FAROF will employ the following process for all relevant activities:

- Include environment compliance considerations while implementing relevant aspects of the program;
- Promote and train local grantees on environmental requirements and standards where relevant to program activities. Such activities will be included in annual work plans, and results will be reported in quarterly reports.
- Each activity will be conducted in a manner consistent with sound design and implementation practices described in the USAID Environmental Guidelines for Small-Scale Activities in Africa, 2nd edition provided at: <http://www.encapafrika.org/egssaa.htm>; IFC Environmental, Health and Safety Guidelines as provided at: <http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines>; World Health Organization guidelines as provided at http://www.who.int/publications/guidelines/environmental_health/en/index.html; and Standard Conditions for Small-Scale Construction, Small-Scale Road Rehabilitation, Small-Scale Water and Wastewater Activities (Appendix IV).
- FAROF will develop an Environmental Manual (EM) and Framework Environmental Mitigation and Monitoring Plan (FEMMP) for specific activities that may have a negative environmental impact. These documentations will then be approved by the Mission Environment Officer and incorporated into the Program design. The EM and FEMMP will be adapted to a specific site prior to the activity or sub-activity implementation.
- FAROF will use the Environmental Review and Assessment Checklist (Appendix I) and Leopold Matrix (Appendix II) as the main reporting documents for each activity having the potential for an adverse environmental impact.
- Prior to the launch of each activity including small grants and subcontracts, FAROF will conduct an Environmental Due Diligence review as an inherent part of the ER Checklist for each activity that may have a potential for moderate and high adverse environmental impact (e.g. Land use for animal grazing , etc.) to document existing environmental concerns and foreseeable environmental effects resulting from such types of activities. If the Environmental Due Diligence results in a finding of potential significant environmental impact, a Scoping Statement (SS) and Environmental Assessment (EA) will be completed by FAROF prior to beginning activities. The TOR,

Scoping Statement and EA Report must be submitted to the USAID Mission Environment Officer for approval.

- As part of the Annual Work Plan, FAROF, in collaboration with the USAID Agreement Officer's Representative (AOR) and Mission Environment Officer shall review all ongoing and planned activities under this award to determine if they are within the scope of the approved Initial Environmental Evaluation for the DG Office of USAID /Nigeria; and classify them in accordance with Table 2 and Section 3 of the IEE.
- FAROF will nominate a staff to serve as the environmental impact professional (EIP) to be approved by the Mission Environment Officer (MEO). The EIP will assess and recommend environmental actions to be taken by the program and will coordinate implementation of mitigation measures, monitoring, and reporting. Specifically, the EIP will conduct environmental reviews and will identify: 1) activity category in consultation with the MEO; 2) potential environmental impacts (based on ER Checklist, EDD, Leopold Matrix, and his/her technical knowledge of the local, U.S., and international environmental standards, guidelines, requirements, and practices; and 3) mitigation and monitoring measures needed. Should the EIP lack special technical knowledge to identify any special environmental impact, FAROF will consult with a specialist in the relevant area.
- FAROF will document environmental baseline conditions prior to activity implementation as an integral part of the site specific EMMP.
- Host country laws and regulations for environmental protection and management will be followed in implementing the activities. For activities categorized as "potential risks" or "definite risks" of adverse environmental impact, FAROF will be required to obtain a letter from the local or regional office for environmental protection stating that the office: a) has been contacted by FAROF concerning the project activities; b) will maintain contact with the project; and c) will be aware of the potential environmental impacts of the project to help ensure that no detrimental impact will result from this project.
- For such activities prior to their implementation FAROF will conduct public consultations and will seek concurrence from the national duly authorized environmental agency on FEMMPs and EMMPs.
- In all cases, implementation will adhere to corresponding Nigerian environmental laws and policies.
- Monitoring will be conducted during the project (beginning with community land mapping other baseline) to determine the environmental impact (positive and/or

negative) of all relevant project activities. FAROF shall use only qualified consultants or staff for overseeing the mitigation and monitoring work. Monitoring shall occur on an as-needed basis. FAROF will ensure that the environmental procedures are implemented, potential impacts mitigated, and indirect and cumulative effects are considered for each activity. If negative environmental impacts are discovered through regular monitoring and evaluation of project activities, immediate actions will be taken to rectify the situation.

- FAROF shall have sufficient resources and permanent staff or consultants with expertise in an environmental field and compliance with Reg. 216. FAROF will consult with a specialist as required in the relevant area.

Resource Allocation, Training and Reporting requirements:

- FAROF will ensure that appropriate resources, staff, equipment and reporting procedures are dedicated to this portion of the project.
- Reports will be submitted to the Agreement Officer's Representative (AOR) and MEO prior to and at the completion of each relevant activity at every affected project site, versus at the end of the project or on a semi-annual or annual basis.
- Sub-contracts or grants from FAROF to other organizations must incorporate provisions stipulating compliance with 22 CFR 216 and ADS 204.
- When deemed necessary by the AOR and MEO, reporting will include photographic documentation and site visit reports which fully document that all proposed mitigation procedures were followed throughout implementation of the subject work including quantification of mitigation.
- FAROF's quarterly reports to USAID shall contain a section specific to Environmental Compliance and will include project summaries along with environmental impacts, success or failure of mitigation measures being implemented, results of environmental monitoring, and any major modifications/revisions to the project, mitigation measures or monitoring procedures. If the activities implemented do not have any negative impact on the environment, this should be documented as well.
- The AOR together with MEO will explain all environmental conditions to FAROF at the post-award conference. The Mission will also arrange for Environmental Compliance Training for FAROF by the MEO prior to the start of project implementation.

APPENDIX I: ENVIRONMENTAL REVIEW & ASSESSMENT CHECKLIST (ER Checklist)

The purpose of this *Environmental Review and Assessment Checklist (ER Checklist)* is to determine whether the proposed action (scope of work) encompasses the potential for environmental pollution or concern and, if so, to determine the scope and extent of additional environmental evaluation, mitigation, and monitoring necessary to fulfill federal U.S. environmental requirements. The *ER Checklist* is intended to be used in conjunction with the Leopold Matrix by the Agreement Officer’s Representative (AOR) to ensure that environmental consequences are taken into account by USAID and the host country.

Date of Review: _____ **DCN of triggering IEE:** _____

Name of reviewer: *(must be qualified environmental professional approved by the MEO)* _____

Name of Project/Activity: _____

Type of Project/Activity: _____

Location: *(Attach a location map as well as site photos in color)* _____

Project/Activity Description: *(Provide sufficient description and details for environmental impact analysis)* _____

Baseline Environmental Conditions: *This section will serve as EDD (Provide site specific environmental conditions due to onsite & offsite sources details for impact analysis; *Note: This portion covers only the baseline conditions, any impacts resulting from the use of land/reconstruction/construction will be covered under sections A through D.)*

A. CHECKLIST FOR ENVIRONMENTAL CONSEQUENCES: Check appropriate column as Yes (Y), Maybe (M), No (N) or Beneficial (B). Briefly explain Y, M and B checks in next Section, "Explanations". A "Y" response does not necessarily indicate a significant effect, but rather an issue that requires focused consideration.

Y. M. N or B

1. Earth Resources

- a. grading, trenching, or excavation in cubic meters or hectare _____
- b. geologic hazards (faults, landslides, liquefaction, un-engineered fill, etc.) _____

- c. contaminated soils or ground water on the site _____
- d. offsite overburden/waste disposal or borrow pits required in cubic meters or tons _____
- e. loss of high-quality farmlands in hectares _____

2. Agricultural and Agrochemical

- a. impacts of animal grazing and animal faeces inputs such as seeds and fertilizers _____
- b. impact of production process on human health and environment _____
- c. other adverse impacts _____

3. Industries

- a. impacts of run-off and run-on water _____
- b. impact of farming such as intensification or extensification _____
- c. impact of other factors _____

4. Air Quality

- a. substantial increase in onsite air pollutant emissions (construction/operation) _____
- b. violation of applicable air pollutant emissions or ambient concentration standards _____
- c. substantial increase in vehicle traffic during construction or operation _____
- d. demolition or blasting for construction _____
- e. substantial increase in odor during construction or operation _____
- f. substantial alteration of microclimate _____

5. Water Resources and Quality

- a. river, stream or lake onsite or within 30 meters of construction _____
- b. withdrawals from or discharges to surface or ground water _____
- c. excavation or placing of fill, removing gravel from, a river, stream or lake _____
- d. onsite storage of liquid fuels or hazardous materials in bulk quantities _____

6. Cultural Resources

- a. prehistoric, historic, or paleontological resources within 30 meters of construction _____
- b. site/facility with unique cultural or ethnic values _____

7. Biological Resources

- a. vegetation removal or construction in wetlands or riparian areas in hectare _____
- b. use of pesticides/rodenticides, insecticides, or herbicides in hectare _____
- c. construction in or adjacent to a designated wildlife refuge _____

8. Planning and Land Use

- a. potential conflict with adjacent land uses _____
- b. non-compliance with existing codes, plans, permits or design factors _____
- c. construction in national park or designated recreational area _____
- d. create substantially annoying source of light or glare _____

- e. relocation of >10 individuals for +6 months _____
- f. interrupt necessary utility or municipal service > 10 individuals for +6 months _____
- g. substantial loss of inefficient use of mineral or non-renewable resources _____
- h. increase existing noise levels >5 decibels for +3 months _____

9. Traffic, Transportation and Circulation

- a. increase vehicle trips >20% or cause substantial congestion _____
- b. design features cause or contribute to safety hazards _____
- c. inadequate access or emergency access for anticipated volume of people or traffic _____

10. Hazards

- a. substantially increase risk of fire, explosion, or hazardous chemical release _____
- b. bulk quantities of hazardous materials or fuels stored on site +3 months _____
- c. create or substantially contribute to human health hazard _____

11. Other Issues (to be used for categories not captured under 1 through 10 above)

- a. substantial adverse impact _____
- b. adverse impact _____
- c. minimal impact _____

B. EXPLANATION OF ENVIRONMENTAL CONSEQUENCES: explain Y, M and B responses

C. RECOMMENDED ACTION (Highlight Appropriate Action):

1. The project has no potential for substantial adverse environmental effects. No further environmental review is required.
2. The project has little potential for substantial adverse environmental effects; however the recommended mitigation measures will be developed and incorporated in the project design and/or construction, operation and maintenance phases. No further environmental review is required.
3. The project has substantial but mitigatable adverse environmental effects and required measures to mitigate environmental effects. Mitigation and Monitoring (M&M) Plan must be developed and approved by the MEO (USAID-Nigeria) prior to implementation. M&M Plan is to be attached to the Scope of Work.
4. The project has potentially substantial adverse environmental effects, but requires more analysis to form a conclusion. **A Scoping Statement must be prepared and be submitted to the BEO/Middle East for approval. Following BEO/ME approval an Environmental Assessment (EA) will be conducted. Project may not be implemented until the BEO approves the final EA.**
5. The project has potentially substantial adverse environmental effects, and revisions to the project design or location or the development of new alternatives is required.
6. The project has substantial and un-mitigatable adverse environmental effects. Mitigation is insufficient to eliminate these effects and alternatives are not feasible. The

project is not recommended for funding.

D. IDENTIFIED SIGNIFICANT ENVIRONMENTAL IMPACTS (including **physical, biological and social**), if any: (Use ER tools such as **Leopold Matrix** to identify significant environmental impacts)

E. RECOMMENDED MITIGATION MEASURES (includes **Public Participation** in case of all types of community and infrastructure projects):

F. RECOMMENDED MONITORING MEASURES (if any):

APPROVAL:

FAROF Chief of Party: _____ Date: _____

USAID-Nigeria AOR: _____ Date: _____

USAID Nigeria Mission
Environmental Officer (MEO): _____ Date: _____

COPY TO:

Bureau Environmental Officer
(BEO/Middle East): _____ Date: _____

APPENDIX II: Leopold Matrix – Insert Project Type Potential Impacts Name of Reviewer: Date:

Environmental component ↗ Project Component	PHYSICAL ENVIRONMENT										BIOLOGICAL ENVIRONMENT								SOCIAL ENVIRONMENT													
	Agricultural Land	Soil Erosion	Slope Stability	Energy/Mineral Resources	Surface Water Quantity	Surface Water Quality	Ground Water Quantity	Ground Water Quality	Air Quality	Noise	Aquatic Ecosystems	Wetland Ecosystems	Terrestrial Ecosystems	Endangered Species	Migratory Species	Beneficial Plants	Beneficial Animals	Pest Plants	Pest Animals	Disease Vectors	Public Health	Resource/Land Use	Distribution Systems	Employment	At Risk Population	Migrant Population	Community Stability	Cultural/Religious Values	Tourism/Recreation	Nutrition		
PLANNING & DESIGN																																
Construction																																
Operation																																

APPENDIX III: ENVIRONMENTAL MITIGATION AND MONITORING PLAN (EMMP) TEMPLATE

Environmental Mitigation and Monitoring Plan (EMMP)

The following EMMP format is recommended. It can be adapted, as necessary.

Environmental Mitigation and Monitoring Plan

Activity Title:

Implementing Partner: FAROF

Activity	Environmental Effects	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Party(ies) responsible.
List all activities in IEE that received a “negative determination with conditions.” <i>Do not list any other activities.</i>	List main environmental effects that require mitigation	If mitigation measures are well-specified in the IEE, quote directly from IEE If they are not well-specified in the IEE, define more specifically here.	Specify indicators to (1) determine if mitigation is in place and (2) successful. For example, visual inspections for seepage around pit latrine; sedimentation at stream crossings, etc.)	For example: “monitor weekly, and report in quarterly reports. If XXX occurs, immediately inform USAID activity manager.”	If appropriate, <i>separately</i> specify the parties responsible for mitigation, for monitoring and for reporting.

APPENDIX IV: USAID Standard Conditions for Small-Scale Activities

Standard Conditions for Small-Scale Construction

(May be used as one of the guidance documents to develop site specific Mitigation and Monitoring Plan, i.e., M&M Plan)

Small-scale construction activities occur in association with a wide variety of development projects financed by USAID. Construction activities include demolition; site clearing; soil grading, leveling and compaction; excavation; pipe and equipment installation; and the erection of physical structures. These activities have the potential to result in significant adverse environmental impacts, but most of those impacts can be mitigated down to acceptable levels through the use of good construction management practices.

These standard conditions have been developed by USAID's Europe and Eurasia Bureau to ensure that small-scale construction activities do not result in significant adverse environmental impact. When adherence to these conditions is required as a condition of small-scale construction contracts, no significant adverse environmental impact is presumed to result from activity implementation. Project officers, CTOs, Mission Environmental Officers, Contract Officers and implementing organizations must nonetheless be aware that these standard conditions are generic in nature, and that additional potentially significant adverse environmental impacts may be associated with small-scale construction activities. **It is the responsibility of the individual USAID missions, and/or their implementing contractors and grantees, to monitor construction and to ensure that significant adverse environmental impacts do not result from these programs.**

For the purposes of this guidance, "small-scale" construction activities are defined here as those that cost less than \$100,000 per construction project. Because of the exceptionally diverse physical conditions under which Bureau construction activities take place, and the very broad kinds of construction that take place, the following standard conditions are to be followed "as practicable and appropriate."

- Establish and adhere to construction timetables that minimize disruption to the normal activities of the construction area.
- Coordinate truck and other construction activity to minimize noise, traffic disruption and dust.
- Develop and implement appropriate human health and worker safety measures during construction.
- Post construction timetables and traffic diversion schedules at the project site.
- Where significant environmental impacts may occur, document and photograph pre-construction and post-construction conditions.
- Avoid subsidence and building stabilization problems through proper foundation excavation, fill placement and borrow pit management.
- Fill should avoid pockets of segregated materials, it should use well-graded materials, and it should be compacted to recognized standards.
- Backfill and/or restore borrow areas and quarries before abandonment unless alternative uses for those sites are planned.

- Control runoff into borrow pits.
- Provide temporary sanitation at the construction site.
- Recover and replant topsoil and plants as practicable.
- Set protocols for vehicle maintenance to control contamination by grease, oil and fuels.
- Install temporary erosion control and sediment retention measures when permanent ones either are not feasible or are delayed.
- Avoid pollution of waterways with stockpiled construction materials.
- Cover stockpiled construction materials, as practicable.
- Place solvents, lubricants, oils, and other semi-hazardous and hazardous liquids over a lined area with appropriate secondary containment in order to contain spillage. Test the integrity of bulk storage tanks and drums, and secure valves on oil and fuel supplies.
- Build appropriate containment structures around bulk storage tanks and materials stores to prevent spillage entering watercourses.
- Handle, store, use and process branded materials in accordance with manufacturer's instructions and recommendations.
- Take waste materials to appropriate, designated local disposal areas.
- Avoid the use of cement; paper; board; sealant and glazing formulations; piping; roofing material; or other materials containing asbestos.
- Do not use PCBs in electric transformers.
- Avoid sealant and glazing formulations that use lead as a drying agent.
- Use lead-free paint, primers, varnishes and stains..
- Minimize the use of solvent-based paints, or replace with water-based materials.
- Minimize burning of waste materials.
- Employ techniques to minimize dust and vapor emissions as practicable (e.g., road speed limits, air extraction equipment, scaffolding covers, road spray).
- Recycle wastewater to the extent practicable.
- Build tanks or other separators for silt-laden material prior to allowing significant outflow into watercourses.
- Build collection channels leading to oil and/or silt traps, particularly around areas used for vehicle washing or fuelling.
- Seal or remove abandoned drains to minimize water contamination.
- Segregate waste which can be salvaged, re-used or recycled.
- Introduce measures to control and minimize the volume of waste on site.
- Employ sensitive strategies with regard to trees, watercourses, plant or animal species or habitats, and important historical and archaeological features.
- As practicable, landscape construction sites in a way that is appropriate to local conditions.
- Minimize the disturbance of, and reduce the spread of, ground contaminants.
- Do not build structures in sensitive areas such as wetlands.
- If waste will be buried on site, avoid siting burial pits up-gradient from drinking water sources such as wells. Pits should be lined with impermeable material (e.g., clay or polyethylene).
- If waste will be buried on site, avoid siting waste pits where water tables are high or underlying geology makes contamination of groundwater likely. If no alternative site is available, ensure that pits are lined with impermeable material.
- Provide for the safe disposal of gray water from bathing and washing.

Additional Conditions to Minimize Impact of Parking Facility Construction

- Compact substrate materials appropriately.
- Where applicable, apply sealant at earliest possible time to limit runoff from unsealed asphalt.
- Provide adequate drainage for the surface area to be paved.
- Return unpaved areas to original or improved contours following construction.
- Re-vegetate areas where vegetation was removed or destroyed during construction.
- Provide vegetation strips within parking lot where possible, including shade trees.
- Retain tree(s) along parking facility and adjacent roadsides.

Standard Conditions for Small-Scale Irrigation Projects

USAID's Bureau for Europe and Eurasia finances, directly or indirectly, a range of small-scale irrigation projects. These include, inter alia, maintenance and rehabilitation of irrigation infrastructure, construction of weirs, improved water management, and improved irrigation system operations and management. Small-scale irrigation activities have the potential to result in significant adverse environmental impacts, but most of those impacts can be mitigated down to acceptable levels through the use of good siting, design, construction, operations and maintenance practices.

These standard conditions have been developed by USAID's Bureau for Europe and Eurasia (E&E) to ensure that small-scale irrigation activities financed by the Bureau do not result in significant adverse environmental impact. When adherence to these conditions is required as a condition of project implementation, no significant adverse environmental impact is presumed to result. Project Officers, CTOs, Mission Environmental Officers, Contract Officers and implementing organizations must nonetheless be aware that these standard conditions are generic in nature, and that additional potentially significant adverse environmental impacts may be associated with small-scale irrigation activities. ***It is the responsibility of the individual USAID missions, and/or their implementing contractors and grantees, to monitor irrigation activities and to ensure that significant adverse environmental impacts do not result.***

For the purposes of this guidance, "small-scale irrigation projects" are defined as activities that: (1) cost less than \$100,000 per individual project; (2) do not bring significant areas of currently unirrigated land under irrigation; (3) do not involve the construction of new dams, trunk canals, or river training works; and (4) do not involve rehabilitation of existing dams over fifty feet in height.

Because of the exceptionally diverse physical, biological and social environments in which Bureau irrigation projects take place, and the broad kinds of irrigation activities that are financed, these Standard Conditions are to be followed "as practicable and appropriate."

Standard Conditions for Small-Scale Irrigation Projects

IRRIGATION SYSTEM IMPROVEMENTS

As a general rule, small-scale irrigation projects should be designed to achieve or promote some or all of the following objectives:

- Better water management, including better water use efficiency and lower water losses
- Better water quality
- Lower sediment loading
- Less erosion
- Less waterlogging and soil salinization
- Improved irrigation system operations and maintenance
- Healthier conditions for irrigation workers.

Specific actions that can be used to avoid or reduce adverse environmental impacts on small-scale irrigation projects are as follows:

Water Use Efficiency

- Improve water control through good canal and weir design
- Keep canals, headworks, regulators, modules and water courses free of debris
- Add water storage capacity where water is seasonally scarce
- Improve water depth consistency through improved land leveling
- Ensure the suitability of crops to available water supply
- Monitor groundwater tables when irrigating from groundwater
- Train farmers and system operators in how to improve water use efficiency.

Water Loss

- Use drip irrigation where practicable
- Use piping where practicable, instead of canals
- When using canals, employ design standards that limit evaporative loss
- Design canals that are relatively narrow and deep
- Cover open canals
- Line canals to limit water loss through percolation
- Reduce evapotranspiration by keeping canals clear of vegetation
- Monitor and repair leaks from cracked canal and containment structures, broken pipes, faulty valves and similar infrastructure
- Reduce evaporation on center pivot and sprinkler systems by irrigating at the coolest time of day
- Train farmers and system operators in how to reduce water loss.

Water Quality

- Use design standards that lower sediment loads in irrigation water
- Identify and monitor water quality parameters with adverse crop and human health impacts
- Train farmers and system operators in how to improve water quality.

Erosion

- Use terracing and similar techniques to reduce land surface erosion
- Plan for devices that can protect against scour where water scour potential is an issue (e.g., culverts, drops, chutes, control structures)
- Train farmers on how to reduce land and facility erosion.

Waterlogging and Salinization

- Monitor groundwater levels and salinity
- Use sprinkler or drip irrigation systems where possible
- Improve system drainage
- Train farmers to recognize waterlogging and salinization problems.

Operations and Maintenance

- As a rule, financing for irrigation infrastructure improvements should not be provided unless appropriate operations and maintenance (O&M) provisions are in place.
- Establish an appropriate maintenance schedule for inspection and reporting performance conditions.
- Periodically review system components to verify that they meet the original design criteria for efficient operations and uniform distribution of water.
- Where appropriate, prepare an O&M Manual before the irrigation system starts operations.
- O&M plans should address, *inter alia*, financial and system power issues.

Human Health

- Understand what water-related disease vectors occur in association with the irrigation system, and design system improvements to reduce those vectors
- Don't use irrigation water as a potable water source
- Line canals and ditches
- Cover or pipe water where possible
- Prevent backwaters or slow-moving water where vegetation and disease vectors are more easily established
- Use application rates that avoid generating areas of standing water
- Keep canals and ditches free of weeds, sediment and snails
- Actively control disease vectors
- Train farmers and system operators to recognize and deal with system characteristics with the potential to adversely affect human health.

Other Irrigation System Conditions

- Design canals to maintain appropriate flow velocities
- Plan for access of canals to facilitate cleaning, sediment removal and vector control
- Design appropriate canal crossing structures at appropriate intervals
- Plan for gates at the lower end of canals so they can be flushed to the nearest drain
- Do not use materials containing asbestos on USAID funded projects.
- Replace lead pipes and joints in delivery system.

STANDARD CONSTRUCTION CONDITIONS

- Establish and adhere to construction timetables that minimize disruption to the normal activities of the construction area.
- Post construction timetables and traffic diversion schedules at the project site
- Coordinate truck and other construction activity to minimize noise, traffic disruption and dust
- Where significant environmental impacts may occur, document and photograph pre-construction and post-construction conditions
- Fill should avoid pockets of segregated materials, it should use well-graded materials, and it should be compacted to recognized standards

- Install temporary erosion control and sediment retention measures when permanent ones either are not feasible or are delayed
- Use proper bedding materials for pipes, and backfill appropriately for the pipeline
- Use riprap (cobbled stone), gravel, or concrete as needed to prevent erosion of drainage structures at the outfall according to established standards
- Do not allow animals to drink directly from water sources
- In coastal areas, maintain withdrawals within safe yield limits to avoid salt water intrusion and well contamination
- Ensure that spilled water and rainwater drain to a soakway or equivalent structure.
- Re-vegetate areas damaged during construction. Do not remove erosion control measures until re-vegetation is completed.
- As practicable, landscape construction sites in a way that is appropriate to local conditions.

EXCAVATION AND BORROW PITS

- Use material from the required excavations first, since it produces a fairly durable aggregate for both surface stabilization and erosion control and is very cost effective.
- Place fences around borrow pit excavations, as necessary.
- Ensure excavation is accompanied by well-engineered drainage to control runoff into the pit.
- Develop specific procedures for storing topsoil, and for phased closure and reshaping and restoration of the pit when extraction has been completed. Include plans for segregating gravel and quarry materials by quality and grade for possible future uses. Where appropriate, include reseedling or re-vegetation to reduce soil erosion, prevent gullyling and minimize visual impacts.
- Discuss with local communities the option of retaining quarry pits as water collection ponds to water cattle, irrigate crops or for similar uses. Issues of disease transmission, and prohibiting the use of pit water for human consumption, bathing, and clothes washing, should be highlighted.
- Decommission/restore areas so that they are suitable for sustainable use after extraction is completed.
- Backfill and/or restore borrow areas and quarries before abandonment if alternative uses for those sites are not planned.

MATERIAL STORAGE AND HANDLING

- Identify sites for temporary/permanent storage of excavated material and construction materials.
- Avoid pollution of waterways with stockpiled construction materials.
- Set protocols for vehicle maintenance to control contamination by grease, oil and fuels.
- Build collection channels leading to oil and/or silt traps, particularly around areas used for vehicle washing or fuelling.
- Build appropriate containment structures around bulk storage tanks and materials stores to prevent spillage entering watercourses.
- Build tanks or other separators for silt-laden material prior to allowing significant outflow into watercourses.
- Cover stockpiled construction materials, as practicable.
- Minimize the disturbance of, and reduce the spread of, ground contaminants.

- Handle, store, use and process branded materials in accordance with manufacturer's instructions and recommendations.
- Segregate construction waste that can be salvaged, re-used or recycled.
- Take construction waste materials to appropriate, designated local disposal areas.
- Minimize burning of waste materials.
- If construction waste will be buried on site, avoid siting burial pits up-gradient from drinking water sources such as wells. Pits should be lined with impermeable material (e.g., clay or polyethylene).
- If construction waste will be buried on site, avoid siting waste pits where water tables are high or underlying geology makes contamination of groundwater likely. If no alternative site is available, ensure that pits are lined with impermeable material.

HUMAN HEALTH AND WORKER SAFETY DURING CONSTRUCTION

- Provide workers with appropriate safety equipment.
- Protect workers from injury by flying or falling rock, slope failures and avalanche
- Explore off-site accommodation for crew
- Keep camp sizes to a minimum.
- Provide temporary sanitation on construction sites
- Maintain good first aid capabilities on site.

Standard Conditions for Small-Scale Road Rehabilitation and Maintenance Activities

Road rehabilitation and maintenance activities occur in conjunction with a variety of community infrastructure and rural development projects financed by USAID. Road rehabilitation and maintenance activities include excavation; soil grading and leveling; fill placement and compaction; placement of base course and road surface materials; and construction of culverts, bridges and surface drainage structures. These activities have the potential to result in significant adverse environmental impacts, but most of those impacts can be mitigated down to acceptable levels through the use of good design and construction practices.

These standard conditions have been developed by USAID's Europe and Eurasia Bureau to ensure that small-scale road rehabilitation and reconstruction activities do not result in significant adverse environmental impact. When adherence to these conditions, as practicable and appropriate, is required as a condition of road rehabilitation and maintenance contracts, no significant adverse environmental impact is presumed to result from activity implementation.

Project officers, CTOs, Mission Environmental Officers, Contract Officers and implementing organizations must nonetheless be aware that these standard conditions are generic in nature, and that additional potentially significant adverse environmental impacts may be associated with road rehabilitation and maintenance activities. ***It is the responsibility of the individual USAID missions, and/or their implementing contractors and grantees, to monitor road rehabilitation and maintenance activities and to ensure that significant adverse environmental impacts do not result.***

This guidance applies only to road rehabilitation and maintenance activities that (1) cost less than \$250,000 per individual project and (2) do not involve realignment of a road outside of its existing right of way (ROW). Because of the exceptionally diverse physical, biological and social environments in which Bureau road rehabilitation and maintenance projects take place, and the broad kinds of rehabilitation and maintenance activities that are financed, these standard conditions are to be followed "as practicable and appropriate."

Noise, Traffic Disruption and Dust

- Establish and adhere to construction timetables that minimize disruption to the normal activities of the construction area. Post construction timetables and traffic diversion schedules at the project site, as appropriate.
- Coordinate truck and other construction activity to minimize noise, traffic disruption and dust.

Human Health and Worker Safety

- Develop and implement appropriate human health and worker safety measures during construction.
- Provide workers with appropriate safety equipment.
- Take safety precautions to protect workers and others from injury by flying or falling rock, slope failures and avalanche.
- Explore off-site accommodation for crew.

- Keep camp size to a minimum.
- Provide temporary sanitation on construction sites.

Ecological and Historical Considerations

- Identify and avoid areas in the project impact zone that may contain important ecological, archeological, paleontological, historic, religious or cultural resources, including forests, wetlands and areas of high biological diversity or threatened species habitat.
- Have construction crews and supervisors be alert for buried historic, religious, and cultural objects, and provide them with procedures to follow if such objects are discovered. Provide incentives for recovery of objects and disincentives for their destruction.
- If impact to sensitive areas cannot be avoided during road reconstruction, involve ecologists, archeologists and engineers in evaluating alternatives and minimizing impacts.
- Where significant environmental impacts may occur, document and photograph pre-construction and post-construction conditions.

Project Design

- Use established design standards for each facet of construction and related activities, e.g., road bed, road surface, drainage, erosion control, re-vegetation, stream crossing, sensitive areas, steep slopes, material extraction, transport and storage, construction camps, decommissioning, etc.
- Minimize use of vertical road cuts even though they are easier to construct, and require less space than flatter slopes. The majority of road cuts should have no more than a ¾:1 to 1:1 slope to promote plant growth. Vertical cuts are acceptable in rocky material and in well-cemented soils, if such cuts are stable according to established slope stability criteria.
- Water the road prior to compaction to strengthen the road surface.
- When possible, delay compaction activities until the beginning of the wet season or when more water is available.
- Use water from settling basins and retention ponds for road maintenance.
- Drive roads after moderate rains to identify areas that collect or gully water. Mark and redesign/rehabilitate as necessary.
- Reshape eroded or culled surfaces so that water will no longer follow the course of the roadway.
- Conduct periodic independent inspection of work to see that it conforms to original plan and design specifications. Provide incentives and disincentives to ensure conformance.

Excavation/Borrow Pits

- Use material from local road cuts first, since it produces a fairly durable aggregate for both surface stabilization and erosion control and is very cost effective.
- Place fence around borrow pit excavations, as necessary.
- Ensure excavation is accompanied by well-engineered drainage to control runoff into the pit.
- Develop specific procedures for storing topsoil and for phased closure and reshaping and restoration of the pit when extraction has been completed. Include plans for segregating gravel and quarry materials by quality and grade for possible future uses. Where appropriate, include reseedling or re-vegetation to reduce soil erosion, prevent gullyng and minimize visual impacts.
- Discuss with local communities the option of retaining quarry pits as water collection ponds to water cattle, irrigate crops or for similar uses. Issues of disease transmission, and prohibiting the use of pit water for human consumption, bathing, and clothes washing, should be highlighted.

- Decommission/restore area so it is suitable for sustainable use after extraction is completed.
- Backfill and/or restore borrow areas and quarries before abandonment if alternative uses for those sites are not planned.

Vegetation Clearing and Revegetation

- Carry out earth moving and removal of vegetation only during dry periods.
- If vegetation must be removed during wet periods, wait until just before actual construction.
- Store topsoil and preserve removed plants for later use.
- Re-vegetate with recovered plants and other appropriate local flora immediately after equipment is removed from a section of the site.

Material Storage

- Identify sites for temporary/permanent storage of excavated material and construction materials.
- Avoid pollution of waterways with stockpiled construction materials.
- Cover stockpiled construction materials, as practicable.

Fill and Grade

- Minimize the volume of fill required.
- Raise road surfaces with stable and durable fill material. Grade with in-slope, out-slope or cambered shape. Install sufficient cross-drains, ditches and settling ponds.
- Use appropriate road surface materials (e.g., asphalt, concrete, gravel) following fill placement, or excavation to design grade.
- Do not fill the flow-line of natural creeks and drainages. Especially in arid areas, design culverts to handle rare high rainfall events.
- Minimize cuts and fills in wetlands.

Drainage and Erosion Control

- Install drainage structures during, instead of after construction. Most erosion associated with roads occurs in the first year after construction. Delaying installation of the drainage features greatly increases the extent of erosion and damage during that time.
- Use outside ditches to control surface water when necessary, but avoid general use as they concentrate water flow and require the road to be at least a meter wider. Install frequent structures, berms or trenches, to divert water upslope of roads into stream channels.
- Install frequent diversion structures, such as water bars, to move water off the road and minimize concentration of water.
- Install drainage crossings to pass water from the uphill to the downhill side of the road. If using culvert pipes, follow accepted sizing and design standards. Where flows are difficult to determine, use structures such as fords, rolling dips, and overflow dips that can accommodate any flow volume and are not susceptible to plugging.
- Stabilize outlet ditches (inside and outside) with small-stone riprap, and/ or vegetative barriers placed on contour to dissipate energy and to prevent the creation or enlargement of gullies.
- Install drainage turnouts at frequent intervals, and extend turnout drains far enough to allow water to dissipate evenly into the ground.
- Install drainage ditches or berms on up-hill slopes to divert water away from the road.

- Visually spot check for drainage problems, including accumulation of water on road surfaces, especially after the first heavy rains following rehabilitation and at the end of the rainy season.
- Monitor and maintain drainage structures and ditches including culverts. Clean out culverts and side channels/runouts when they begin to fill with sediment.
- Install temporary erosion control features when permanent ones will be delayed. Use erosion control measures such as hay bales, berms, and straw or fabric barriers.
- Stabilize slopes by planting vegetation. Work with agronomists to identify native species with the best erosion control properties, root strength, site adaptability, and other socially useful properties. Set up nurseries in project areas to supply necessary plants. Do not use non-native plants. Use soil stabilizing chemicals or geo-textiles (fabrics) where feasible and appropriate.

Material Disposal

- Break up old road surface material. Remove and dispose of surface material (e.g. asphalt) if necessary, and loosen soil of previous track to accelerate regeneration of vegetation.
- Segregate waste which can be salvaged, re-used or recycled.
- Take waste materials to appropriate, designated local disposal areas.
- Minimize burning of waste materials.
- If waste will be buried on site, avoid siting burial pits up-gradient of drinking water sources such as wells. Pits should be lined with impermeable material (e.g., clay or polyethylene).
- If waste will be buried on site, avoid siting waste pits where water tables are high or underlying geology makes contamination of groundwater likely. If no alternative site is available, ensure that pits are lined with impermeable material.

Hazardous Materials

- Do not use asbestos materials on USAID-funded projects.
- Do not use herbicides on USAID-funded projects without prior written approval.
- Place solvents, lubricants, oils, and other semi-hazardous and hazardous liquids over a lined area with appropriate secondary containment in order to contain spillage. Test the integrity of bulk storage tanks and drums, and secure valves on oil and fuel supplies.
- Build appropriate containment structures around bulk storage tanks and materials stores to prevent spillage entering watercourses.
- Handle, store, use and process branded materials in accordance with manufacturer's instructions and recommendations.
- Set protocols for vehicle maintenance such as requiring that repairs and fueling occur elsewhere or over impervious surface such as plastic sheeting. Prevent dumping of hazardous materials. Capture leaks or spills with drop cloths or wood shavings. Burn waste oil that is not reusable/readily recyclable, that does not contain heavy metals, and that is flammable.
- Take special precautions to prevent release/dumping of debris, oil, fuel, sand cement, and similar harmful materials.
- Install concrete pads, drains and oil/water separators in areas where vehicle and equipment maintenance and fueling will occur regularly.
- Prevent fuel tank leaks by monitoring and cross-checking fuel levels, deliveries and use; checking pipes and joints for leaks; tightening generator fuel lines; and preventing over-filling of main storage and vehicle tanks.

Standard Conditions for Small-Scale Water and Wastewater Activities

USAID's Bureau for Europe and Eurasia finances, directly or indirectly, a large number of water and wastewater activities. These occur in both rural and urban areas, and in association with residential, commercial, industrial and medical facilities. Water and wastewater activities have the potential to result in significant adverse environmental impacts, but most of those impacts can be mitigated down to acceptable levels through the use of good siting, design, construction, operations and maintenance practices.

These standard conditions for small-scale water and wastewater activities have been developed by USAID's Europe and Eurasia Bureau (E&E) to ensure that water and wastewater activities financed by the Bureau do not result in significant adverse environmental impact. When adherence to these conditions, as practical and appropriate, is required as a condition of water and wastewater contracts, no significant adverse environmental impact is presumed to result from activity implementation.

Project Officers, CTOs, Mission Environmental Officers, Contract Officers and implementing organizations must nonetheless be aware that these standard conditions are generic in nature, and that additional potentially significant adverse environmental impacts may be associated with water and wastewater activities. **It is the responsibility of the individual USAID missions, and/or their implementing contractors and grantees, to monitor water and wastewater activities and to ensure that significant adverse environmental impacts do not result.**

For the purposes of this guidance, "small-scale" water and wastewater activities are defined as those that cost less than \$200,000 per individual construction project. Because of the exceptionally diverse physical, biological and social environments under which Bureau water and wastewater projects take place, and the broad kinds of water and wastewater activities that are financed, these standard conditions are to be followed "as practicable and appropriate."

Standard Conditions for Water and Wastewater Activities

Standard Siting Conditions

- Site water supply facilities in a way that minimizes the potential for contamination, taking into account existing and likely future land use patterns in the water supply—i.e., wellhead protection, or upper watershed—area.
- Site wastewater facilities in a way that minimizes their potential for contaminating water supply sources, or for exposing human populations to water-borne contaminants.
- Avoid siting water supply and wastewater facilities in flood-prone areas.
- Do not site water and wastewater facilities on active faults or other areas where ground stability problems such as soil creep occur.
- Locate wastewater facilities downwind of local population.
- Build latrines and similar sanitation facilities down gradient of water supply wells. As necessary, evaluate depth to water table including seasonal fluctuations. Pit latrines should not be

installed where the water table is shallow or the composition of the overlying deposits make groundwater vulnerable to contamination.

- Employ sensitive siting strategies that take into appropriate consideration impact on trees, wetlands and watercourses, important plant and animal habitat, and significant historical and archaeological resources. Avoid or mitigate adverse impacts to these resources.

Standard Design Conditions

- In general, design water supply facilities to protect water quality, minimize the potential for contamination, and minimize operation and maintenance costs.
- In general, design wastewater facilities to avoid contamination of water supplies and human exposure, and minimize operation and maintenance costs.
- In general, do not construct new wastewater pipelines unless treatment is provided at the outfall.
- Where latrines are installed, use improved ventilated pit designs that reduce insect vectors.

Standard Construction Conditions

- Establish and adhere to construction timetables that minimize disruption to the normal activities of the construction area.
- Post construction timetables and traffic diversion schedules at the project site.
- Coordinate truck and other construction activity to minimize noise, traffic disruption and dust.
- Develop and implement appropriate human health and worker safety measures during construction as well as during operation and maintenance phases.
- Where significant environmental impacts may occur, document and photograph pre-construction and post-construction conditions.
- Avoid subsidence and building stabilization problems through proper foundation excavation, fill placement and borrow pit management.
- Fill should avoid pockets of segregated materials, it should use well-graded materials, and it should be compacted to recognized standards.
- Backfill and/or restore borrow areas and quarries before abandonment unless alternative uses for those sites are planned.
- Control runoff into borrow pits.
- Install temporary erosion control and sediment retention measures when permanent ones either are not feasible or are delayed.
- Provide temporary sanitation at the construction site.
- Set protocols for vehicle maintenance to control contamination by grease, oil and fuels.
- Build collection channels leading to oil and/or silt traps, particularly around areas used for vehicle washing or fuelling.
- Build appropriate containment structures around bulk storage tanks and materials stores to prevent spillage entering watercourses.
- Build tanks or other separators for silt-laden material prior to allowing significant outflow into watercourses.
- Avoid pollution of waterways with stockpiled construction materials.
- Cover stockpiled construction materials, as practicable.
- Minimize the disturbance of, and reduce the spread of, ground contaminants.

- Handle, store, use and process branded materials in accordance with manufacturer's instructions and recommendations.
- Use lead-free paint, primers, varnishes and stains.
- Minimize the use of solvent-based paints.
- Introduce measures to control and minimize the volume of waste on site.
- Segregate waste that can be salvaged, re-used or recycled.
- Take waste materials to appropriate, designated local disposal areas.
- Minimize burning of waste materials.
- If waste will be buried on site, avoid siting burial pits up-gradient from drinking water sources such as wells. Pits should be lined with impermeable material (e.g., clay or polyethylene).
- If waste will be buried on site, avoid siting waste pits where water tables are high or underlying geology makes contamination of groundwater likely. If no alternative site is available, ensure that pits are lined with impermeable material.
- Provide for the safe disposal of gray water from bathing and washing.
- Recycle wastewater to the extent practicable.
- Seal or remove abandoned drains to minimize water contamination.
- Use proper bedding materials for pipes, and backfill appropriately for the pipeline.
- Use riprap (cobbled stone), gravel, or concrete as needed to prevent erosion of drainage structures at the outfall of sanitation projects according to established standards.
- Monitor and repair leaks from cracked containment structures, broken pipes, faulty valves and similar structures.
- Do not use piping containing asbestos.
- Replace lead pipes and joints in drinking water delivery system.
- Provide proper wellhead protection against contaminant sources.
- Keep livestock from grazing immediately up-gradient of water supplies.
- Do not allow animals to drink directly from water sources, unless those sources are subsequently treated.
- In coastal areas, maintain withdrawals within safe yield limits to avoid salt water intrusion and well contamination.
- Ensure that spilled water and rainwater drain to a soakway or equivalent structure.
- Monitor drains and soakways and keep clear of debris.
- Collect and dispose of sludge from wastewater treatment facilities at appropriate frequencies.
- Dispose of sludge in areas designated by local authorities.
- Test sludge for metals, pathogens and other appropriate constituents prior to use as fertilizer.
- Recover and replant topsoil and plants as practicable.
- Re-vegetate areas damaged during construction. Do not remove erosion control measures until re-vegetation is completed.
- As practicable, landscape construction sites in a way that is appropriate to local conditions.

Standard Operations and Maintenance Conditions

- As a rule, financing for water and wastewater infrastructure improvements should not be provided unless appropriate operations and maintenance (O&M) provisions are in place.
- On larger projects, an O&M Manual should be prepared before water or wastewater system operations begin.

- Address financial and system power issues in O&M plans.

Additional Standard Conditions for Slaughterhouses

- Separate solid and liquid (wastewater, blood and other liquids) wastes prior to disposal.
- Recycle any wastes that can appropriately be recycled.
- Collect solid waste in containers for disposal to an approved treatment storage and disposal facility, if practicable.
- Treat liquid effluent with either anaerobic or aerobic pond systems, or discharge to a wastewater treatment facility that is able to handle these special materials.

Additional Standard Conditions for Health Clinics and Medical Facilities

- Do not dispose of hazardous and chemical wastes to sewer systems.
- Collect and segregate waste from patients treated with cytotoxic drugs.
- Separate and disinfect stools from cholera patients prior to discharge.
- Disinfect blood before discharge to sewers unless there is an adequate wastewater treatment facility.
- Water-soluble, relatively mild pharmaceutical mixtures, such as vitamin solutions, cough syrups, intravenous solutions, eye drops, etc.—but not antibiotics—may be diluted with large amounts of water and then discharged to sewer systems that can handle them.
- Avoid burial of chemical wastes where there is potential for groundwater contamination.