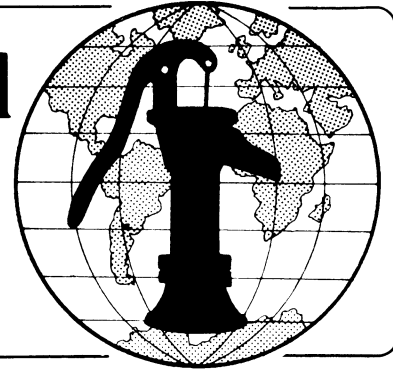


Water for the World



Maintaining Intakes Technical Note No. RWS. 1.O.2

Intakes must be well maintained to ensure that there is sufficient water flow from the source to the users. If intakes do not function properly, the flow of water could decrease or even stop completely. This would cause people to look for another water source, possibly a less suitable one. This technical note discusses maintenance of the types of intakes described in "Constructing Intakes for Ponds, Lakes and Reservoirs," RWS.1.C.2, and "Constructing Intakes for Streams and Rivers," RWS.1.C.3.

Useful Definitions

FIXED INTAKE - An intake that does not float or move but is stationary.

PERFORATED PIPE - Pipe that has small holes in it.

SEDIMENT - Small particles of dirt and other matter that settle to the bottom of water.

SUSPENDED MATTER - Visible material in the water that does not settle.

Maintenance of Intakes for Ponds and Lakes

The most important part of the intake is the screened section of perforated pipe which is in the water. All water that enters the system must come through this perforated section. The smaller the openings in the screen, the more unwanted material is kept out of the system. However, smaller openings will cause the screen to clog more quickly. A screen with small openings needs to be cleaned more frequently but yields better quality water. Maintenance of the perforated pipe involves the steps listed below.

1. At least once every three months, check the intake screen as shown in Figure 1 to be sure it is not clogged with suspended matter or plant life. For floating intakes, lift the screened section of the pipe from the water and decide if cleaning is necessary. If the screen is dirty, scrub it clean with a brush. If damaged, replace it with a new one. Be sure to shut off the pump before beginning maintenance.

2. Follow the same steps for a rigid plastic pipe intake on fixed supports. For this kind of intake, the screened section of the pipe cannot be lifted from the water because the pipe does not bend. Wait until the water is low enough that wading into the water is possible. Then, remove the screen from the pipe to check its condition. Be sure to shut the gate or globe valve before removing the screen from the pipe. All pumping equipment should be shut off during intake maintenance.

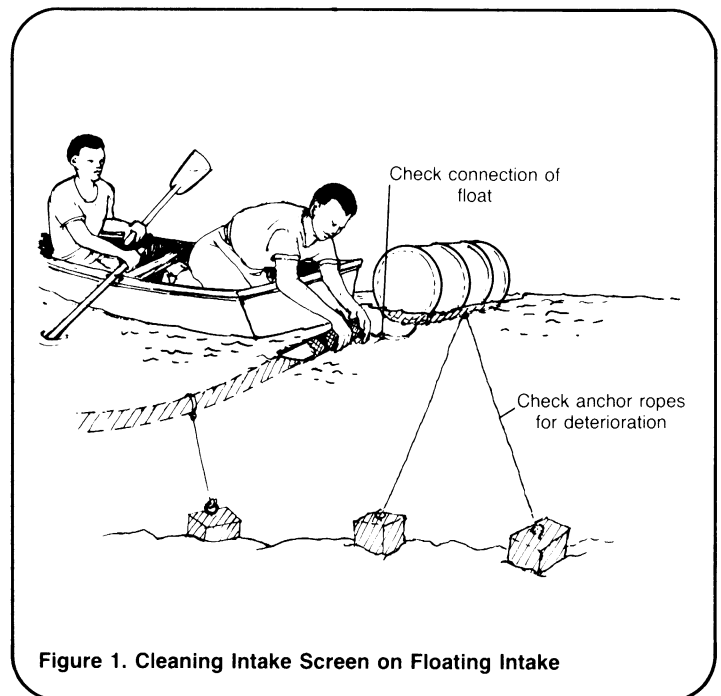


Figure 1. Cleaning Intake Screen on Floating Intake

Where the water is too deep for wading, a system like the one shown in Figure 2 can be installed. Attach an elbow joint to the end of the pipe and connect to it a length of pipe that extends to the surface of the pond or lake. The pipe should contain perforations at the desired water intake level. To screen the perforations allow accessibility for maintenance, attach pieces of rubber tubing to the screen. The rubber tubing should fit over the intake pipe. The screen can be lowered on the pipe to cover the perforations in the pipe. For maintenance, the screen is simply lifted from the pipe by someone in a boat, cleaned and slid onto the pipe once again.

3. During long periods of dry weather, check the water level of the pond or lake to ensure that it is not lower than expected. If a floating intake drifts too close to the bottom of the pond or lake, clogging is likely. Suspended materials may enter the system causing sediment build-up in storage tanks.

For fixed intakes, be sure that the intake is always below water level. If the water level falls a great deal, the intake pipe may have to be lowered. Do not lower it so much that sediment from the bottom can be picked up. If the water level falls during a long drought, the amount of water used by the community must be decreased so the water source will not dry up.

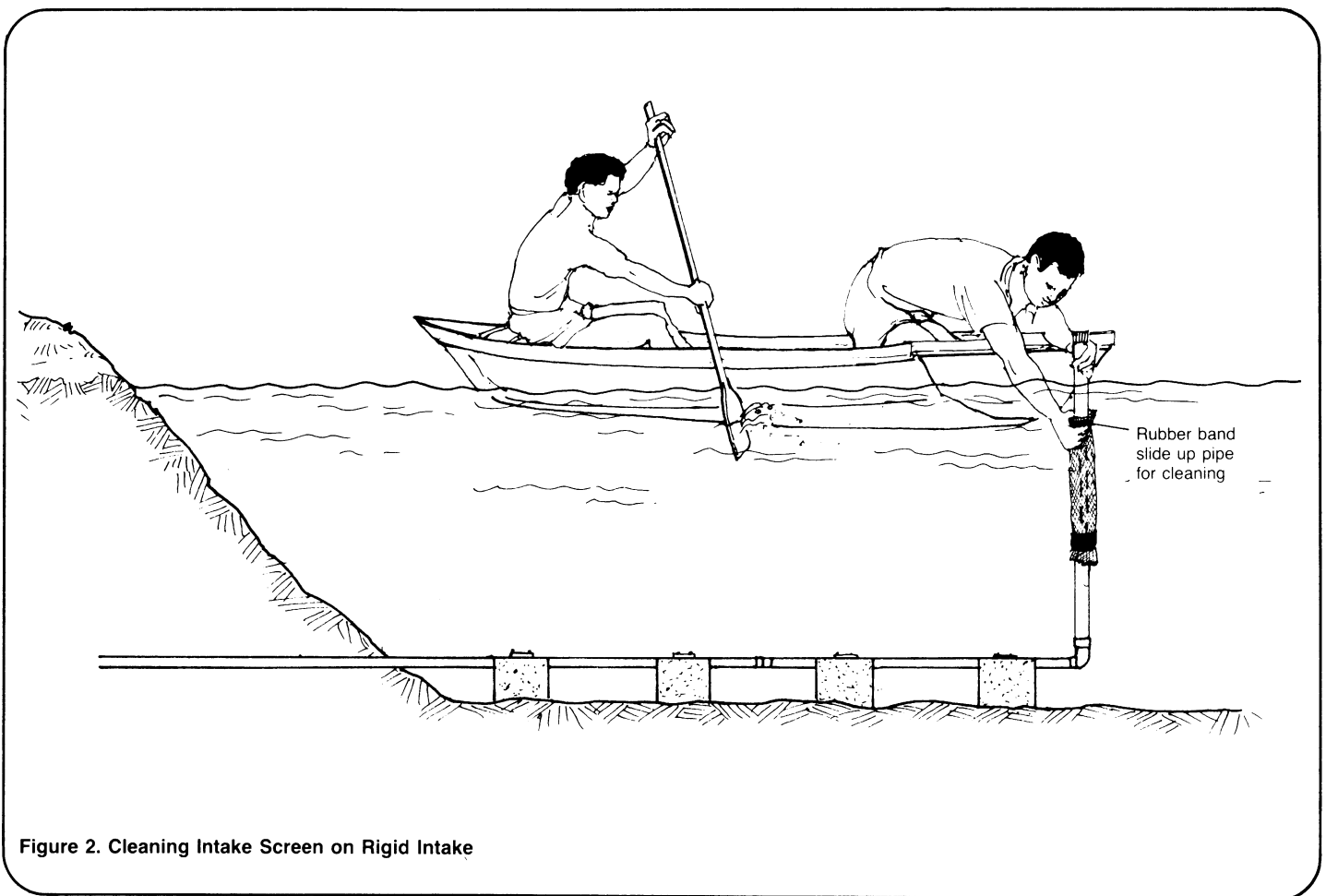


Figure 2. Cleaning Intake Screen on Rigid Intake

4. Check the float, rope, and anchors of the floating intakes to ensure that everything is in good condition. All parts should be securely tied to the float. If rope shows wear or rot, replace it.

5. Check points where PVC or galvanized pipe is coupled and make sure there is no leakage. On the shore, check the ground above the installed pipe to see if there are any wet spots. If the ground is wet, check to see if water is leaking from the pipe. More detailed information may be found in "Detecting and Correcting Leaking Pipes," RWS.4.0.1.

Maintenance of Intakes for Rivers and Streams

Intakes for rivers and streams consist of infiltration systems, gravity flow systems, and permanent direct pumping systems. Follow the steps outlined below for an effective maintenance program.

Infiltration Systems. The maintenance of riverside wells and clear water wells is not difficult. The water in them should be analyzed every six months to ensure that the quality is acceptable. This analysis must be done carefully to detect any contamination. For information on

sampling and analyzing water in the field, see "Taking a Water Sample," RWS.3.P.2, and "Analyzing a Water Sample," RWS.3.P.3.

The biggest maintenance problem is the pump. Pumps must be maintained properly if they are to provide good service. See "Operating and Maintaining Mechanical Pumps," RWS.4.0.2, and "Operating and Maintaining Hand Pumps," RWS.4.0.3, for information about pumps.

Collection pipes for infiltration galleries may need maintenance to ensure adequate flow into the water system. Follow the steps below for maintaining collection pipes.

1. Check the flow of water into the clear water well. Be sure that the flow from each side is good. If the water flow is low on either or both sides, suspect that the collection system is clogged.

2. Remove the obstruction from the pipe. The simplest way to unclog the pipes is to pour water into the cleanout system. Uncap the installed cleanout pipe and pour water into the system to break up any sediment. If a hose and water pressure are available, they should be used to thoroughly flush out the collection system. See Figure 3.

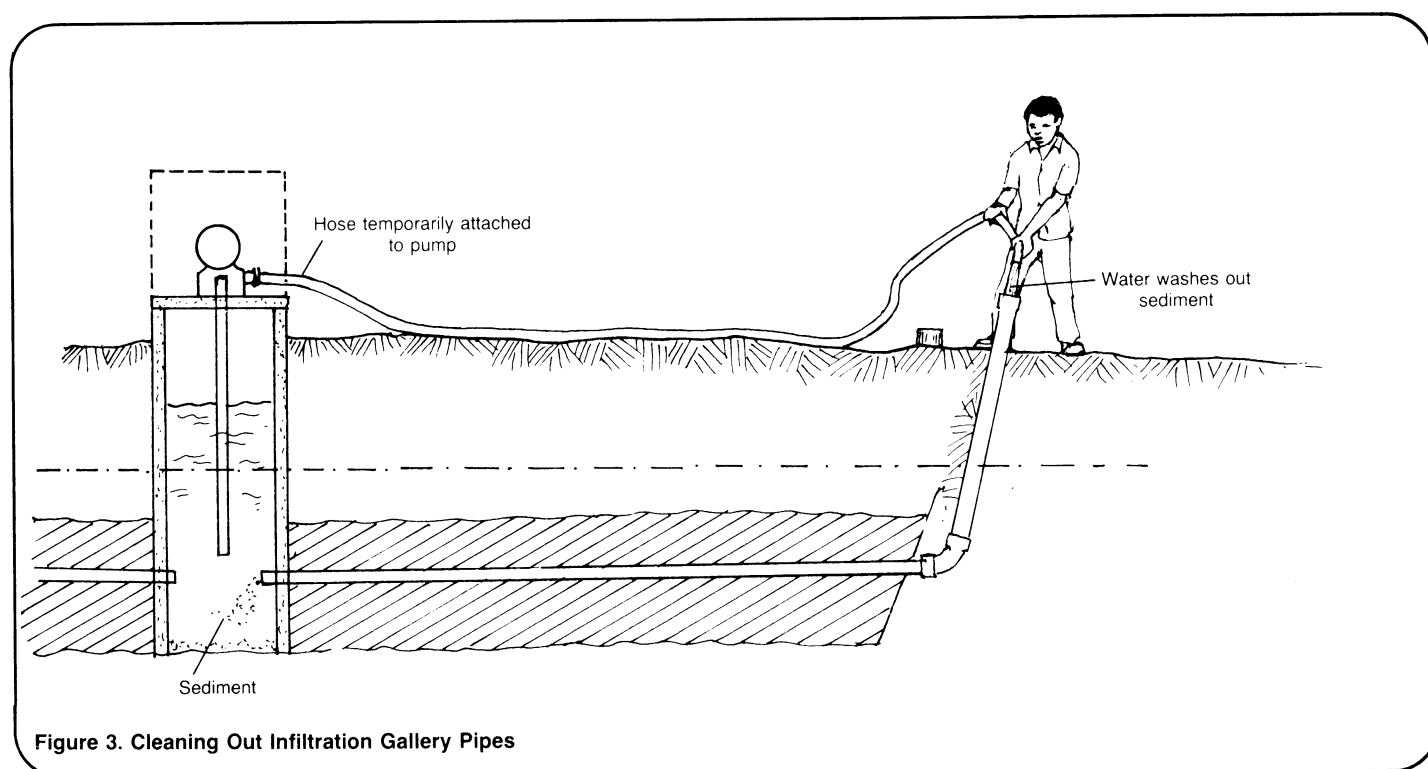


Figure 3. Cleaning Out Infiltration Gallery Pipes

3. If the pipes remains clogged, it may be necessary to locate the clogging by digging out around the collection pipe. Begin digging at the point furthest from the well and dig toward the well. Uncover the entire collection pipe and locate where the clogging is occurring. Clean those areas. Use buckets of water from the well and flush out the sediment from the system. Lay fresh sand and gravel in the filter bed before backfilling the trench.

Gravity Flow and Direct Pumping.

For the winged-wall gravity flow system shown in Figure 4 and the permanent intake connected to a mechanical pump shown in Figure 5, maintenance involves the prevention of clogging around the intake.

1. Periodically clean the screen that covers the intake pipe so that water flows freely through the wire mesh. If, the screen is dirty, brush it clean. If it is damaged or in very bad condition, replace it.

2. Clear out any debris that may block the intake in the winged-wall collection box. Tree limbs, leaves, and any other objects should be removed from within the collection area.

3. Check the structure to see if it is securely anchored in the stream. If any movement is suspected, weight the structure with large rocks.

4. Look for any sign of leaking around the pipe and the wall. If the seal is not watertight, mix some mortar and put it around the pipe.

Direct pumping systems require little maintenance of the intake itself. The screens must be cleaned periodically as with other intakes. Be sure that the pipe is always submerged by checking the water level during dry periods. If the river dries up, an alternative source must be found.

The greatest maintenance problems are likely to occur from leaking pipes or mechanical failure of the pump. For information on maintaining pipes and pumps, see "Detecting and Correcting Leaking Pipes," RWS.4.0.1, and "Operating and Maintaining Mechanical Pumps," RWS.4.0.2.

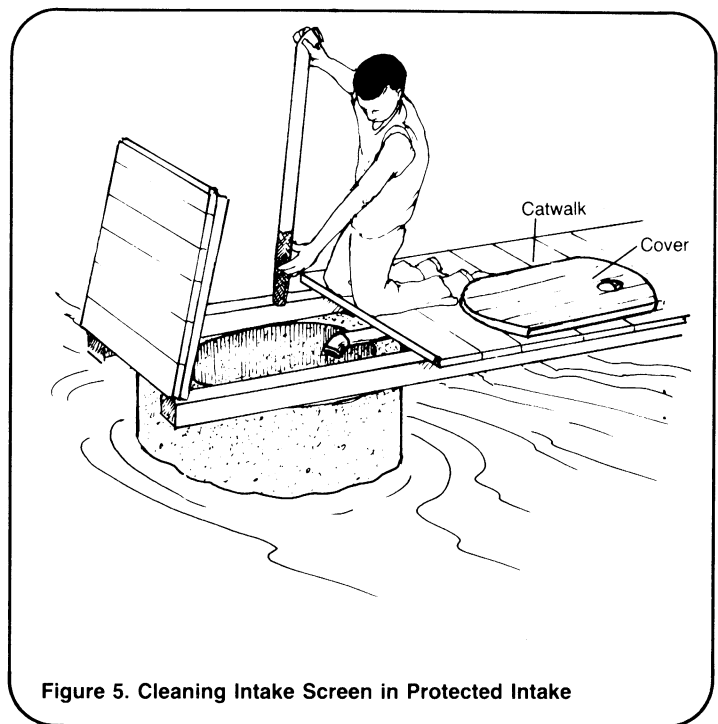
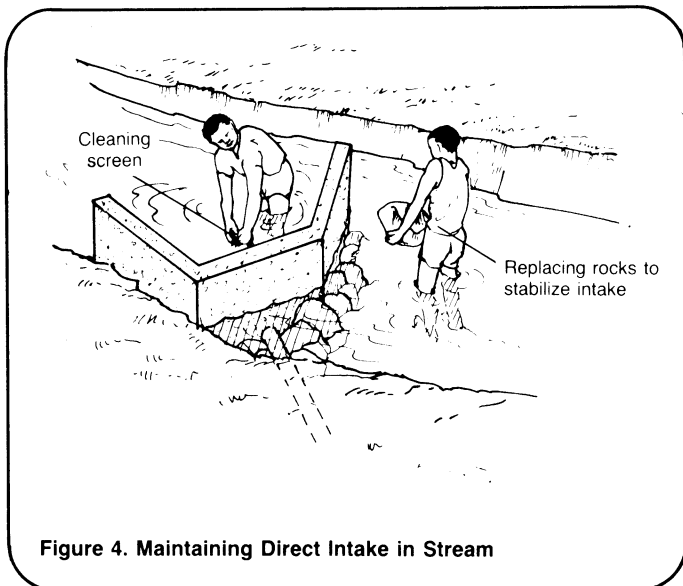


Figure 4. Maintaining Direct Intake in Stream

Figure 5. Cleaning Intake Screen in Protected Intake

Technical Notes are part of a set of "Water for the World" materials produced under contract to the U.S. Agency for International Development by National Demonstration Water Project, Institute for Rural Water, and National Environmental Health Association. Artwork was done by Redwing Art Service. Technical Notes are intended to provide assistance to a broad range of people with field responsibility for village water supply and sanitation projects in the developing nations. For more detail on the purpose, organization and suggestions for use of Technical Notes, see the introductory Note in the series, titled "Using 'Water for the World' Technical Notes." Other parts of the "Water for the World" series include a comprehensive Program Manual and several Policy Perspectives. Further information on these materials may be obtained from the Development Information Center, Agency for International Development, Washington, D.C., 20523, U.S.A.