



Wastewater

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Who to ask: wastewater operator, health aides, public health nurse

35. Have there ever been any outbreaks of sewage related diseases in the village?

Yes No ?

If yes, what diseases and when?

The village health aide or the public health nurse should have a record of any disease outbreaks related to sewage that have occurred in your village.

A sewage-related disease, such as Hepatitis A, is spread when a person comes into contact with fecal material from a contaminated person or object and then transmits the contamination to his/her mouth. If an infected person does not clean his/her hands thoroughly after going to the bathroom, disease may be spread to others either by touching them or when preparing food. People may be carriers of a disease and not always show signs of sickness. Dogs and other pets may also be carriers of disease. Proper handling of wastewater and good sanitation helps prevent the spread of diseases associated with sewage.

Sewage-related diseases are greatly reduced with good health sanitation education and practices. The village health aide can be used as a resource to educate people on proper sanitation practices.

KOTLIK, ALASKA

During the summer of 1990, the Village of Kotlik experienced an outbreak of viral meningitis, an extremely infectious, painful illness that can be fatal when left untreated. Viral meningitis is transmitted by contact with human sewage. It is spread through contaminated food and water, often by people who have germs on their hands, don't wash, then contaminate food or drink consumed by others. Nearly 80 people in the village were stricken with the disease. What was the cause? Two leaky underground bunkers filled with sewage which had been contaminated with the meningitis virus.

In the past, Kotlik's full honey buckets were dumped into underground bunkers-lidded pits dug into the permafrost and scattered between homes throughout the village. The bunkers got full. Their contents oozed into the muddy summer soil, and the children played in the puddles nearby. The children tracked mud into houses, where babies crawled on floors.

36. Does the village have a sewage lagoon?

Yes No ?

If yes, how far is it from the village?



Sewage lagoon located below the residential area of a village

Photo Courtesy Kurt Egelhofer



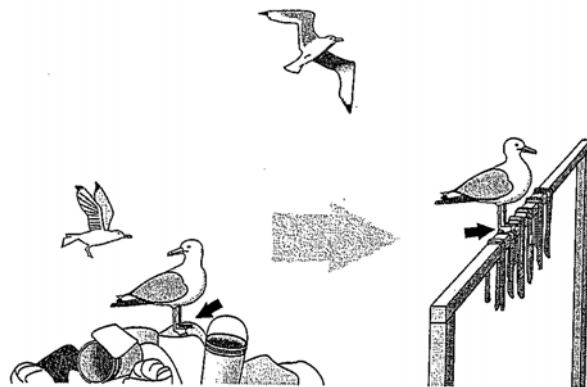
Children playing near a sewage lagoon

Photo Courtesy Desirae Roehl

Most villages have a sewage lagoon where sewage is dumped. A properly located sewage lagoon can help reduce some of the potential health problems associated with sewage. The sewage lagoon should be located at a safe distance from the residential section of the village. If it is too close there is a greater chance of disease being spread.

Both the distance and the direction of the sewage lagoon from the residential section of the village are important factors in determining the location of the sewage lagoon. Prevailing winds can carry unhealthy vapors or smells from the sewage lagoon to residential areas of the village if the sewage lagoon is located improperly. It is especially important to educate children about the dangers of playing near the sewage lagoon.

If a person in the community lives near the sewage lagoon and is drying fish on a rack, the fish can be exposed to disease-carrying flies that visit the sewage lagoon and then land on the fish. On the other hand, in villages where honey buckets are used, the sewage lagoon should not be so far from the village that the people are tempted to dump elsewhere.



37. Does the sewage lagoon ever leak or overflow?

Yes No ?

If yes, why and when?



Building a sewage lagoon with a liner
Photo Courtesy Kurt Egelhofer

38. Are Health Aides told when there is a sewage spill in the village?

Yes No ?



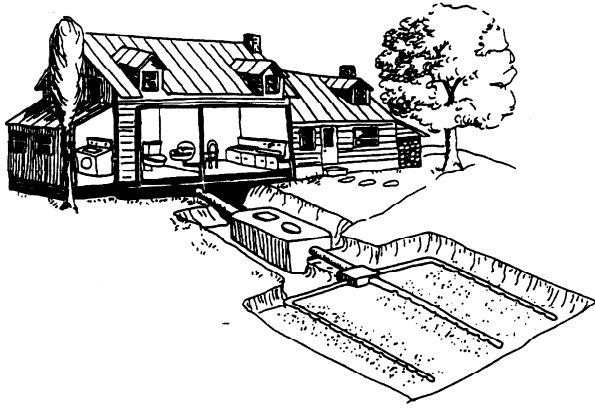
Raw sewage from a leaking or overflowing sewage lagoon is a potential source of disease and a public health risk. Some reasons why a sewage lagoon may leak or overflow include

- Structural damage. The sides of the lagoon may break down
- Poor location. A sewage lagoon that is improperly located may leak or overflow.
- Inadequate size. The size of the lagoon may be too small to handle the amount of wastewater.
- Flooding. Spring and fall flooding may cause the lagoon to overflow and spread to the residential area

If flooding of the sewage lagoon is continuously a problem in your village, it may be necessary to relocate the lagoon. This is particularly true if overflowing sewage affects the community's water supply.

Health aides need to be told when there is a sewage spill in the village for the following reasons

- The health aide can educate the community and explain the health risks associated with a sewage spill.
- The health aide can then consider the spill as a possible cause of any stomach illnesses that may occur.



The intent of questions #39-43 is to find out how many different types of sewage collection and disposal systems are in your community and how many homes or other buildings utilize each of the systems.

Below is a description of the various types of sewage systems and the levels of risk (hazard) associated with each system.

39. Does your village have piped sewer?
 Yes No ?

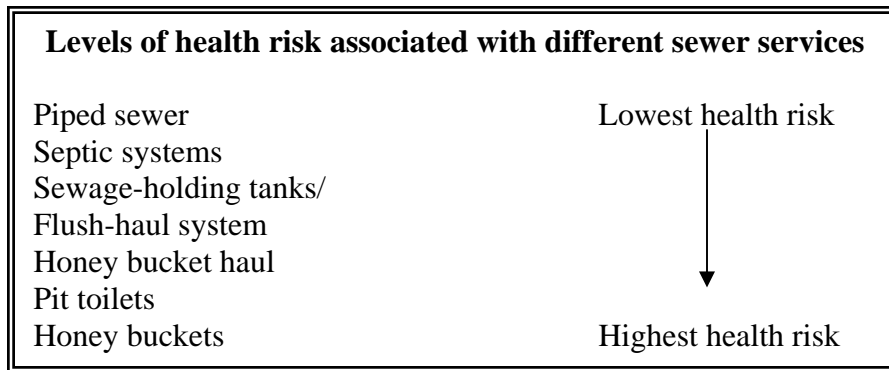
If yes, to how many homes or buildings?

Piped sewer. A piped wastewater system has the least risk of all types of sewer services because no one is exposed to sewage. The number of houses or other buildings on piped sewer is an indication of the number of people who have a very sanitary method of wastewater disposal in your village.

40. Does your village have septic tank systems?
 Yes No ?

If yes, to how many homes or buildings?

Septic systems. A septic system normally consists of a piping system in the home that collects wastewater from your toilet, shower, bathroom fixtures and kitchen sink. This wastewater leaves the home through a pipe that flows into a tank and then into a drain field next to the home.



41. Does your village have sewage holding tanks (flush-haul systems)?

Yes No ?

If yes, to how many homes or buildings?



Flush-haul operators may be exposed to raw sewage when emptying the tank
Photo Courtesy Joe Sarcone

42. Does your village use privies or out houses?

Yes No ?

If yes, how many homes or buildings?

Sewage holding tanks (Flush-haul system). After piped water systems, sewage-holding tanks are the most sanitary method of wastewater disposal. The health risks associated with using a sewage holding tank lies mostly with the operator who empties the tanks. The operator is usually the only person in danger of becoming contaminated as she/he must unscrew the valves to empty the tanks. Flush-haul operators may be exposed to raw sewage when emptying the tank. They should use personal protective clothing and take necessary cleaning precautions to ensure that raw sewage is not tracked into their homes and transferred to others.

Privy/Outhouse. A privy and an outhouse are the same thing, an outdoor toilet. An outhouse is one step better than using a honey bucket because you don't have to transport the sewage.

Outhouses can be a problem because they can potentially pollute the drinking water source in a community (Consult your local water utility before constructing an outhouse or dumping any sewage). This is why they should be at least 100 feet away from the high water marks of lakes and rivers. The bottom of the hole for an outhouse should be at least 4 feet above groundwater. Try and locate your outhouse as far away from your drinking water source as possible.



Abandoned outhouse
Photo Courtesy Oxcenia O'Domin



Poorly located outhouses can be a problem because they can potentially pollute the drinking water in a community
Photo Courtesy Bill Stokes

43. Does your village use honey buckets?

Yes No ?

If yes, how many homes or buildings?



Honey bucket users are at the highest risk for catching sewage-related diseases
Photo Courtesy Jim Patterson

Outhouses are home to a variety of bacteria and organisms that carry disease. The flies that gather at the outhouse are the same flies that end up landing on the fish you are drying and on the food in your house. It is a good idea to occasionally cover the waste in your outhouse with lime or baking soda to help reduce the number of flies. Using a toilet seat with a cover in your outhouse will help keep out the flies. The number of flies can also be reduced by covering any openings/vents with screen material. Is there an adequate supply of hydrated lime or baking soda in the community store or utility

Honey buckets. A honey bucket is a type of toilet that is usually made from a five-gallon plastic bucket lined with a plastic bag. Sometimes a toilet seat is placed on the top of the bucket for seating.

The honey bucket is the wastewater system most likely to spread disease. This is because people using honey buckets must carry the waste from their homes to the disposal site.

Honey bucket users have the highest chance of coming into contact with human waste. The number of outhouses or buildings that use honey buckets within the community is an indicator of the number of people who are at a greater risk of catching diseases associated with sewage.

44. Does your village have an operating honey bucket haul or flush-haul system?

Yes No ?



Operating honey bucket haul system
Photo Courtesy Joe Sarcone

If your village uses honey buckets or has sewage holding tanks, there must be an operating sewage removal system to haul the sewage away from the homes and to the sewage lagoon. An operating sewage removal system consists of someone reliable who is employed to haul the sewage from homes and other buildings, and maintain sewage removal equipment in good working order. It also means that the person who is hauling the sewage does the job safely so that no sewage is spilled on the way to the sewage lagoon. A haul system that is not operated correctly means that there is greater risk of sewage related diseases infecting the community.

45. Is any of the equipment for the honey bucket or flush-haul system broken?

Yes No ?

If yes, for how long?

If any of the equipment for hauling sewage is broken or not working properly, removing sewage from the village cannot be done safely. It is important that the haul system is in good operating order and that essential spare parts are available in case there is an emergency. For every day that the haul system is not working, the community is exposed to health risks related to sewage.

Tips for maintaining equipment for haul systems

Routine maintenance and repairs on sewage haul equipment can prevent an accident from happening and help to eliminate some potential breakdowns in your haul system. For example, to safely operate a honey bucket hauler

- *The equipment should be greased and/or inspected on a regular basis.*
- *A damaged container should be repaired immediately to avoid spills.*
- *For a flush-haul system, the tank should be flushed with clean water after each use in order to clean the valves and prevent deterioration of the haul tank.*
- *The tank, valves and pressure pump should be inspected at least once a year.*

46. Is the honey bucket or flush-haul system operated safely so that no sewage is spilled on the ground in the village?

Yes No ?

If a spill occurs do people know how to clean it up? How?

Spills from honey buckets occur during transportation and when the buckets are dumped at the collection site. One of the major problems with these systems is accidental spills. No matter how careful the handler is, there will always be spills. The sewage that is spilled can be washed downstream into another village's water intake. In addition, the spill may be spread around the community by humans, dogs, snowmobiles, birds, flies, etc.



Photo Courtesy Joe Sarcone

TIPS FOR CLEANING UP SEWAGE SPILLS:

After removing all visible sewage from the ground, a lime and water solution, called "milk of lime," can be poured over the spilled sewage. Milk of lime is made by adding 1 pound of hydrated lime to 1 gallon of water. Larger amounts can be made by mixing a 50 pound bag with 50 gallons of water in a clean 55-gallon drum. Hydrated lime can be purchased in 50 pound bags through commercial distributors in Anchorage and sometimes in the gardening section of department stores.

★Care should be taken to prevent children from coming into contact with milk of lime. This substance can cause severe skin and eye irritation. When mixing the lime, an apron, goggles and rubber gloves should be worn to avoid contact.

A safer alternative for cleaning up sewage spills in open areas is to use a weak bleach (water mixed with bleach) solution to pour over the cleaned up spill.



Once sewage has been spilled, it is very easy for it to be carried into homes on shoes or paws of pets. Once the pathogens (disease-causing organisms) are tracked into a home, it is easy for children, who typically play on the floor, to pick up the organisms on their hands and transfer them to their mouth. This is one of the primary ways sewage diseases are spread.

In communities that use honey buckets, each individual is responsible for preventing spills. If a spill occurs, the individual responsible must make sure it is cleaned up. The area of the spill needs to be sanitized with chlorine or lime, especially if the spill is in a place where people commonly spend time.

47. Do all village residents properly dispose of their honey bucket waste?

Yes No ?

If no, explain?



Honey Bucket Disposal System

Honey buckets should be disposed of at a collection site, an outhouse or at a lagoon. Residents who dump their honey buckets behind their homes or in other places around the village are putting the entire community in danger. Sewage that is dumped in or around the village is a source of disease and feeds disease-causing organisms.



Honey bucket bag collection system
Photo Courtesy Bill Stokes

The village council should address the issue of assisting elders with sewage disposal. There have been cases where elders have been forced to dump their sewage behind their home in the winter because they were not physically able to dispose of the sewage in an outhouse or lagoon. Having a program to assist elders could prevent some cases of improper disposal.

Educating people in the community about the dangers involved in improperly disposing of sewage is the most important key to preventing sewage-related problems in your village. When people are aware of how easily sewage-related diseases, such as Hepatitis A, can be spread throughout an entire community, they will begin to think twice before dumping their honey bucket improperly.

Some villages have developed ordinances making the illegal dumping of honey-bucket waste illegal. If caught, violators would be subject to a fine or community service. It is extremely important that all residents are aware of the proper location in the community to dispose of their waste and why it's important.

48. Do the honey bucket haul or flush-haul operators get paid?

Yes No ?

If yes, how much and for how many hours per day?



Insulated flush-haul equipment
Photo Courtesy Bill Stokes

49. Do the honey bucket haul or flush-haul operators have a place to clean up and change out of their work clothes before going home?

Yes No ?

If yes, where?

What is their cleaning routine?

Honey bucket haul or flush-haul operators have the important job of removing sewage from containers in the community so sewage-related diseases do not occur.

The honey bucket haul or flush-haul operator has a tremendous effect on the public health of a community. If the operator(s) is not doing his/her job properly, the entire village is at risk.

An operator's pay should be high enough so that the position is competitive and it encourages the operator to stay with the job. The community needs to understand that safe sewage disposal is not a free service. Getting good compensation for the work of operating the honey bucket haul or flush-haul system gives greater incentive for the operator to do a good job and to stay with the job. It also helps give the respect that the operator truly deserves.

It is very important that the honey bucket haul or flush-haul operators have a place to clean up, change, and store their work clothes before going home. If the operator changes his/her clothes at home, it is almost guaranteed that the operator will carry raw sewage and diseases back to family members and other members of the community. Some communities provide their honey bucket haul operators with a daily token for a shower at the washeteria as part of the compensation for their work.

The health of the operator should be a concern for the entire community

50. Does the village school actively promote safe sanitation methods and/or have a sanitation curriculum?

Yes No ?

If yes, what grades?

The village school should promote safe sanitation at all grade levels, K-12. Often, the school curriculum teaches safe sanitation at the early primary grade levels while neglecting to encourage sanitation education at the upper levels. Safe sanitation must include all different areas (i.e. hygiene, solid waste disposal, safe drinking water, etc.) and be stressed at all grade levels.

There are many ways to incorporate safe sanitation into the curriculum in the upper levels of schooling. For example, students should be studying life cycles of disease-causing organisms, the importance of water, testing water, recycling, hygiene and methods of waste disposal. These topics are not limited to the subject of science as they can be incorporated into all subject areas.

The village school can be a resource to the village regarding sanitation issues. Information can be made available at the school for the village residents to use. For example, if there was a Hepatitis A breakout in the village, the school could have information available explaining how to deal with such a problem. The village health aide and the village school can work together to address all public health issues relating to the village



Youth Environmental Summit in Gakona
Photo Courtesy Mt. Sanford Tribal Consortium

51. Do the Health Aides assist the village school with sanitation presentations?

Yes No ?

52. Do Environmental Health Specialists from your regional health organization assist in educating residents about sanitation issues?

Yes No ?

The health aides in your village are a valuable resource for sanitation issues. Involving the health aides in the schools and having them assist with presentations can help prevent sanitation problems in your village. The health aides are familiar with the results of poor sanitation and can help educate students. Working with students also gives the health aides a better idea of some of the issues surrounding safe sanitation with children. By playing an active role in the school, the health aide is focusing on prevention rather than treatment.

Another great resource is the Environmental Health Specialist from your regional health organization. They could provide some really great information regarding sanitation and health to the community.



Classroom Presentation in Napaskiak 2011