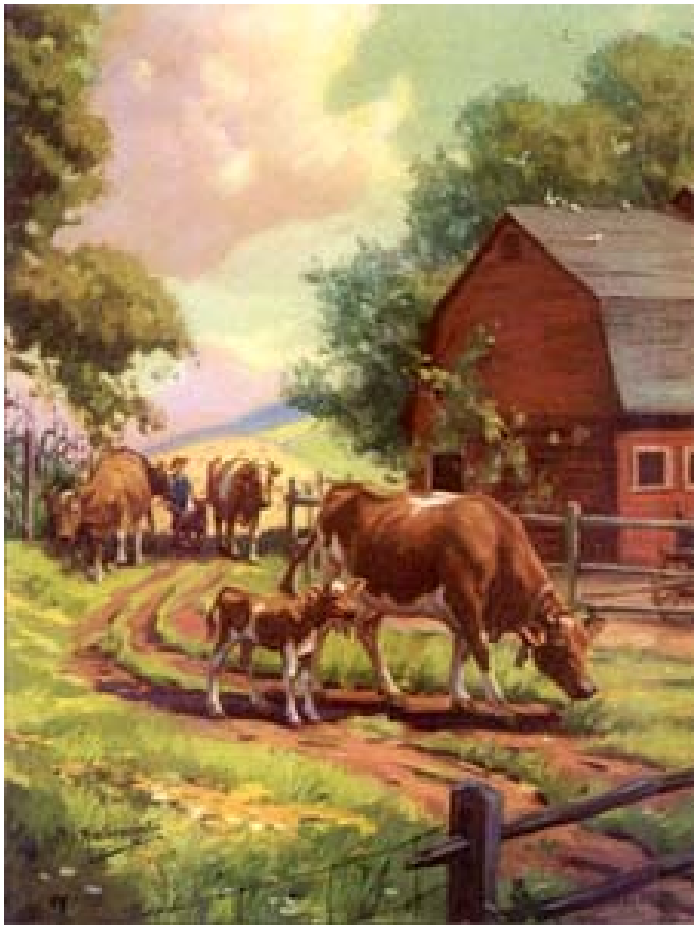
Washington State Department of Agriculture



Milk Producers Licensing Handbook

August 2006

FOREWORD

It is the responsibility of State and Federal regulatory agencies to uphold the supply of wholesome, quality food for the consumer. Without guidelines and regulations, the safety and quality of milk as we know it may not exist. The goal of Washington State Department of Agriculture (WSDA), Food Safety Program is to obtain voluntary compliance in a manner that is mutually beneficial for the milk industry as well as the consumer.

Washington State's dairy inspection program operates under the requirements of the relevant Washington State regulations and Public Health Service/Food and Drug Administration Pasteurized Milk Ordinance (PMO). Compliance with the PMO is essential for Washington's farm bulk tank units (BTUs). The standards applied in Washington State follow national standards that allow your milk (products) to move without restriction in interstate commerce.

As the holder of a Milk Producers license, you have accepted certain responsibilities in order to sell a Grade A product. The information included in this manual is intended to assist you, the dairy producer, in meeting inspection criteria for Grade A dairies and understanding the elements that are addressed during the licensing and inspection of your facility.

As a producer, your contact with WSDA will mainly be with the Food Safety Officer (inspector) assigned to your geographical area. This individual is trained in the field of milk sanitation and production and is qualified to help identify problems/violations that can affect the safety and quality of your milk. It is their responsibility to provide technical assistance when needed to help you remain in compliance with State and Federal regulations.

Please keep in mind the following:

- Milk Producer requirements are in effect 365 day a year – not just during regulatory inspections. By performing your own inspections and maintaining your facility, you will help ensure you are within compliance.
- The consuming public is depending on industry to produce a healthful, wholesome, high-quality product. You are the first step in this process.
- We will work with you in a cooperative way to ensure the public interest is protected, and your products have unrestricted market access.

If you have any questions, please contact the Food Safety Office in your area for assistance or clarification. For additional information, contact:

Washington State Department of Agriculture
Food Safety Program
P.O. Box 42560
Olympia, Washington 98504-2560
(360) 902-1876

Milk Producers Licensing Handbook

Chapter 1: Applying for a Milk Producers License

An application for the a Milk Producers License needs to be submitted during the following circumstances:

- Starting / Building a New Dairy *
- Change in Ownership *
- Farm Name Change
- Location Address Change
- Mailing Address Change
- Switching to a New Shipping Company

*These types of changes will require an inspection and a new satisfactory water sample completed prior to the receipt of a new license. If an immediate family member takes over the operations of the dairy farm from the original licensee, it is considered a name change only and will not require any additional processes.

When submitting a new application use the check list. Items for attachment:

- ✓ Application
- ✓ Current water sample
- ✓ Farm diagram

Other items may include:

- ✓ Animal Health Testing Records
- ✓ Bulk Tank Installation Application

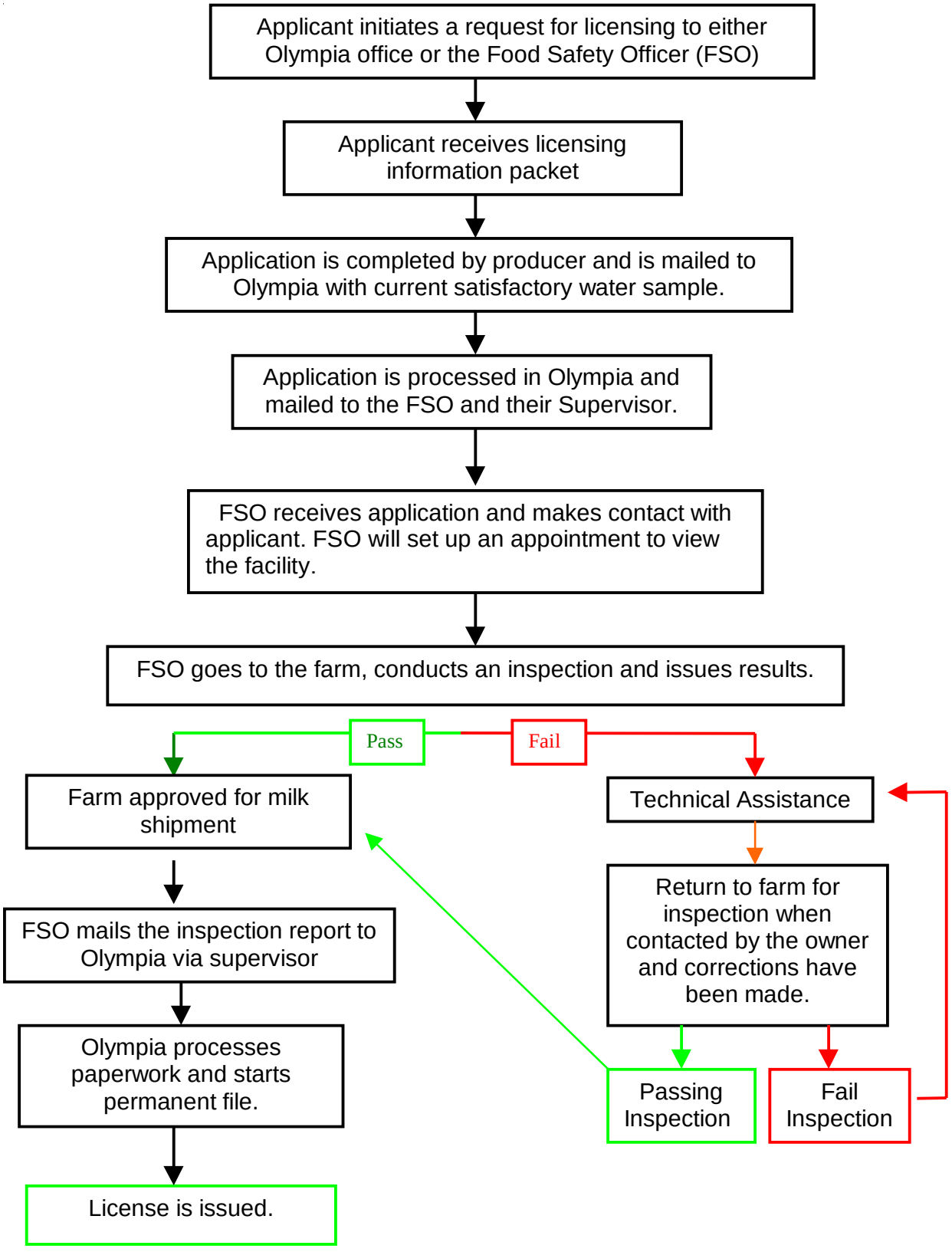
An application may also be submitted for any additional changes such as contact information or business structure. Please see the following flow chart for explanation of the licensing process. This process can take up to as long as four to six weeks. The earlier you can get the application submitted the sooner your dairy inspector, known as a Food Safety Officer, can add you to their schedule.

Once an application process is completed, whether it is a simple name change or a whole new dairy, notification will be sent to the following:

- USDA Agricultural Marketing Service
- Washington Dairy Products Commission
- Washington State Dairy Federation
- WSDA Livestock Nutrient Management Program
- Food Safety Regional Supervisor
- Food Safety Officer
- Co-op Field Representative

Notification may also be sent to the State Veterinarian’s office and/or the Beef Commission.

Milk Producer Licensing Flow Chart



Questions & Answers:

Q1: **When do I need to fill out a new bulk tank application**?

A: When you are:

- relocating an existing tank within a facility, OR
- installing a new or used bulk tank or silo.

Q2: **Are there different regulations for goat/ sheep dairies**?

A: No. Technical assistance specifically geared toward small ruminant dairy farms can be obtained from the Dairy Practice Council (see contacts section of reference chapter). Your FSO can also provide great technical assistance with any structural questions you may have.

However, there may be different heard health testing requirements. You should work with Animal Services to find out what those are.

Q3: **What if the farm is leased**?

A: Parties involved shall decide who will be the responsible party as the license holder.

Q4: **Can there be more than one license on a farm**?

A: Yes. Contact WSDA for additional information and practicality of situation.

Q5: **How current must my herd health tests be?**

A: Testing results should be no more than 6 monthes old at time of application. The State Veternarian establishes testing requirements based on current animal health concerns. Please contact the Animal HeatlhProgram at 360.902.1878 or visit www.agr.wa.gov for the most current information.

Chapter 2: Licensing Requirements

There is more to receiving a Milk Producer License than submitting a completed application (an application form, a satisfactory water sample, and a farm layout diagram). You must also pass the licensing inspection.

The licensing inspection requires all items marked as “L”, licensing requirement, or “C”, critical items, to be in compliance with an overall score of 90 or above. Some of the “L” items may only be one point debit items for a regular inspection, but these violations have been recognized as inspection items that need to be addressed prior to operating. You will notice that “L” items are mostly construction-related. This allows for any renovations or adjustments that need to be completed before the operation starts to avoid causing down time in your production.

WSDA milk producer inspection standards are based upon chapter 15.36 RCW, current WACs, and relevant sections of the PMO. You can find copies of these documents in the reference chapter.

Questions & Answers:

Q1: **What happens if a licensing inspection fails**?
A: Once all needed corrections have been made, contact the FSO to schedule a new inspection.

Q2: **Do I need any other permits or licenses to begin operations**?
A: While it is not a requirement of the WSDA Food Safety Program, there may be other programs within WSDA or other agencies you should contact. Please check the contacts in chapter 7 for a listing.

Q3: **When may I begin operations**?
A: You may begin operating immediately upon passing the licensing inspection.

Q4: **Once licensed, where can I sell my raw milk?**
A: Licensed producers may only sell their milk for further processing either through the general milk pool or directly to a processing facility. In order to sell raw milk anywhere else, including retail raw milk for human consumption or for pet feed, additional licensing is required. You will also need to obtain additional licensing if you decide to do any value added processing yourself, such as farmstead cheeses. Please contact the Food Safety Program or talk with your Food Safety Officer about the requirements.

MILK PRODUCER INSPECTION CRITERIA AND DEBIT VALUES

Washington State Department of Agriculture
Food Safety Program
P.O. Box 42560, Olympia, WA 98504-2560
Phone: (360) 902-1876 Fax (360) 902-2087

Cows

1. Abnormal Milk: (Maximum 5)

		Debit Value
Cows secreting abnormal milk milked last or in separate equipment	(a)	C/L
Abnormal milk properly handled and disposed of	(b)	5
Proper care of abnormal milk handling equipment	(c)	5

Milking Barn, Stable or Parlor

2. Construction: (Max 5)

Floors, gutters, and feed troughs of concrete or equally impervious materials; in good repair	(a)	1 L
Walls and ceilings smooth, painted or finished adequately; in good repair; ceiling dust-tight	(b)	1 L
Separate stalls or pens for horses, calves, and bulls; no overcrowding	(c)	1
Adequate natural and/or artificial light; well distributed	(d)	1 L
Properly ventilated	(e)	1

3. Cleanliness: (Max 3)

Clean and free of litter	(a)	3 L
No swine or fowl	(b)	3 L

4. Cowyard: (Max 3)

Graded to drain; no pooled water or wastes	(a)	3
Cowyard clean; cattle housing areas & manure packs properly maintained	(b)	3 L
No swine	(c)	3
Manure stored inaccessible to cows	(d)	3

Milkhouse or Room

5. Construction and Facilities: (Max 8)

Floors (Max 1)

Smooth; concrete or other impervious material; in good repair	(a)	1 L
Graded to drain	(b)	1 L
Drains trapped, if connected to sanitary system	(c)	1

Walls and Ceilings (Max 1)

Approved material and finish	(a)	1 L
Good repair (windows, doors, and hoseport included)	(b)	1 L

Lighting and Ventilation (Max 2)

Adequate natural and/or artificial light; properly distributed	(a)	2 L
Adequate ventilation	(b)	2
Doors and windows closed during dusty weather	(c)	2
Vents and lighting fixtures properly installed	(d)	2 L

Miscellaneous Requirements (Max 2)

Used for milkhouse operations only; sufficient size	(a)	2 L
No direct opening into living quarters or barn, except as permitted by *Ordinance*	(b)	2 L
Liquid wastes properly disposed of	(c)	2
Proper hoseport where required	(d)	2 L
Acceptable surface under hoseport	(e)	2 L
Suitable shelter for transport truck as required by this *Ordinance*	(f)	2 L

Cleaning Facilities (Max 2)

		Debit Value
Two-compartment wash and rinse vat of adequate size	(a)	2 L
Suitable water heating facilities	(b)	2 L
Water under pressure piped to milkhouse	(c)	2 L

6. Cleanliness: (Max 4)

Floors, walls, windows, tables, and similar non-product contact surfaces clean	(a)	4 L
No trash, unnecessary articles, animals or fowl	(b)	4 L

Toilet and Water Supply

7. Toilet: (Max 4)

Provided; conveniently located	(a)	4 L
Constructed and operated according to *Ordinance*	(b)	4 L
No evidence of human wastes about premises	(c)	4 L
Toilet room in compliance with *Ordinance*	(d)	4 L

8. Water Supply (Max 2 or 5)

Last sample date _____

Constructed and operated according to *Ordinance*	(a)	2 or 5 L
Complies with bacteriological standards	(b)	C/L
No connection between safe and unsafe supplies; no improper submerged inlets	(c)	2/C/L

Utensils and Equipment

9. Construction (Max 4)

Smooth, impervious, nonabsorbent, safe materials; easily cleanable; seamless hooded pails	(a)	4 L
In good repair; accessible for inspection	(b)	4 L
Approved single-service articles; not reused	(c)	4 L
Utensils and equipment of proper design	(d)	4 L
Approved CIP milk pipeline system	(e)	4 L

10. Cleaning: * (Max 5)

Utensils and equipment clean	(a)	5/C/L

11. Sanitization: * (Max 5)

All multi-use containers and equipment subjected to approved sanitization process (See *Ordinance*)	(a)	5/C/L

12. Storage: (Max 2)

All multi-use containers and equipment properly stored	(a)	2
Stored to assure complete drainage, where applicable	(b)	2
Single-service articles properly stored	(c)	2

Milking

13. Flanks, Udders, and Teats: (Max 5)

Milking done in barn, stable, or parlor	(a)	5
Brushing completed before milking begun	(b)	5
Flanks, bellies, udders, and tails of cows clean at time of milking; clipped when required	(c)	5
Teats treated with sanitizing solution and dried, just prior to milking	(d)	5
No wet hand milking	(e)	5

Transfer and Protection of Milk

14. Protection From Contamination: (Max 3)

		Debit Value
No overcrowding	(a)	3
Product and CIP circuits separated	(b)	3
Improperly handled milk discarded	(c)	3
Immediate removal of milk	(d)	3
Milk and equipment properly protected	(e)	3 L
Sanitized milk surfaces not exposed to contamination	(f)	3 L
Air under pressure of proper quality	(g)	3 L

15. Drug & Chemical Control: (Max 2 or 5 or 7)

Cleaners and sanitizers properly identified	(a)	2 L
Drug administration equipment properly handled and stored	(b)	2 L (Max 2)
Drugs properly labeled (name and address) and stored	(c)	2 L
Drugs properly labeled (directions for use, cautionary statements, active ingredient)	(d)	5 L
Drugs properly used and stored to preclude contamination of milk	(e)	C/L

Personnel

16. Hand-Washing Facilities: (Max 2)

Proper hand-washing facilities convenient to milking operations	(a)	2 L
Wash and rinse vats not used as hand-washing facilities	(b)	2

17. Personnel Cleanliness: (Max 1)

Hands washed clean & dried before milking, or performing milk house functions; rewashed when contaminated	(a)	1
Clean outer garments worn	(b)	1

Cooling

18. Cooling: (Max 5)

Milk cooled to 40° F or less within 2 hours after milking, except as permitted by *Ordinance*	(a)	C/L
Recirculated cooling water from safe source and properly protected; complies with bacteriological standards	(b)	5 L

Last sample date _____

Temperature recording with 7 day chart	(c)	5 L

Pest Control

19. Insect and Rodent Control: (Max 9)

Fly breeding minimized by approved manure disposal methods (See *Ordinance*)	(a)	3
Manure packs properly maintained	(b)	3 > 3
All milkhouse openings effectively screened or otherwise protected; doors tight and self-closing; screen doors open outward	(c)	2
Milkhouse free of insects and rodents	(d)	2 > 2 L
Approved pesticides; used properly	(e)	2
Equipment and utensils not exposed to pesticide contamination	(f)	2 > 2
Surroundings neat and clean; free of harborages and breeding areas	(g)	2
Feed storage not attraction for birds, rodents or insects	(h)	2 > 2 L

NOTE: Critical Items Shaded in Gray

*** Critical Violation Only If Both Items 10a and 11a Are Cited***

Item numbers correspond to required sanitation items for Grade A raw milk for pasteurization in the Grade A Pasteurized Milk Ordinance--Recommendations of the US Food and Drug Administration and/or in accordance with the Milk and Milk Products Act (chapter 15.36 RCW) and applicable rules adopted thereunder.

October 2003

Chapter 3: Potable Water Systems Requirements

Water systems are regulated by the Washington State Department of Health and Department of Ecology. Maintaining a water system is a constant challenge due to the continual changes as repairs and additions are made to piping and valving schemes.

To avoid violations, frequent checks of the system should be made. This means the producer should become familiar with potential areas of violations. A walk through with the Food Safety Officer is recommended to identify all key components of the system.

The key to answering questions related to water systems lies in knowing exactly what constitutes a cross connection and the requirements for water supply. This can only be addressed through regular inspections of the water system by the dairy producer.

These key areas should be routinely reviewed by the dairy producer to identify possible violations:

- The water supply system shall be constructed and maintained to prevent contamination.
- Cross contamination can occur regardless of whether the system receives water from a groundwater source or a surface water source. Sources of cross contamination are underground water leaks, submerged supply lines, gutters, feces, unsafe water in water troughs, and sanitizer injection pumps.
- Plumbing cross-connections are defined as actual or potential connections between a potable (drinkable) and non-potable water supply. Dairy farm water supplies can become contaminated by storage tanks into water lines.

It is the responsibility of every dairy producer to be familiar with the dangers of cross-connections and to remove them from their dairy farm's water distribution system.

Table A - Water Sampling Schedule

Type of Water System	How often samples are required
Drilled wells, Dug wells, Spring and Surface	Every three years
Recirculating and Reclaim	Every six months
Sandpoint, driven point and buried well seal	Every six months
City water and community water associations	Not needed

Water samples are also needed for new installation or modification of current system.

For additional information refer to PMO appendix D Standards for Water Sources.

Questions & Answers

Q1: **How recent of a water sample will I need when applying for a new license**?
A: A satisfactory water sample test result that is not older than 30 days must be included with the completed application. Applicant is responsible for initial water sampling.

Q2: **Samples are screened for what type of organism?**
A: Testing is completed in search of total coliform levels.

Q3: **Who is responsible for collecting the routine water sample?**
A: Your Food Safety Officer (FSO) will sample as per water sampling schedule. See Table A above.

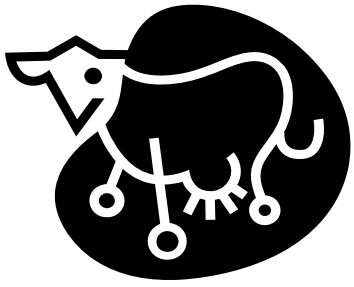
Q4: **Who's responsible for follow up sampling if I have an unsatisfactory water sample result?**
A: It is the responsibility of the producer to see to it that a satisfactory water sample is submitted. Often a field representative from your co-op will do this for you or assist in the completion and submission of the satisfactory water results to the Olympia office.

Q5: **From which outlet can I collect / pull my water sample?**
A: The most frequently used outlet connected to potable water source (e.g., handwash or CIP sink).

Q6: **Where do I take my water sample for testing?**
A: Contact your County Health Department or field / dairy representative (See contacts in the Reference chapter 7).

Q7: **Where can non-potable water be used?**
A: Non-potable water can be used anywhere other than the milkhouse and milking operations (e.g., stock tanks, gutter flush, and wash down of the parlor).

Q8: **Which valves have been approved as backflow prevention devices?**
A: For a current list of acceptable valves contact the Olympia office or FSO.



Chapter 4: Inspections

Although an inspection is cause for concern, it is not a cause for panic. If the dairy producer's standards are consistent with or exceed the regulations, a routine inspection will evolve into a visit to the facility to help identify problems, which will help the dairy producer provide a higher quality product for their customers. Good dairy practices and trained employees should produce satisfactory inspection results and an excellent rapport between the inspector and the milk producer. The receptive and cooperative dairy farmer will discover that the Food Safety Officer (FSO) may be able to offer practical solutions to vexing problems.

Routine inspections of dairy farms are typically conducted not more than every four months and not less than every six months. Farm inspections are normally performed during working daylight hours. Exceptions may include complaint investigations, equipment washing and other potential issues (i.e., evaluation of tanker drivers).

Prior to beginning the inspection, the FSO will make every reasonable attempt to locate the producer and properly identify themselves and the nature of the visit. Every reasonable attempt means looking for the farm operator in the milk house, parlor and /or generally around the outside and inside premises of the milking operation. This does not include the farmhouse, private residences, apartments, other sleeping quarters or remote areas of the farm.

The inspection of a dairy farm includes:

- milkhouse
- milking barn, stable or parlor
- adjacent storage areas
- cowyard and cattle housing areas
- general surroundings to the milkhouse
- waste disposal areas
- water supply and its distribution system
- dairy animal maternity areas
- animal treatment areas or hospital barns
- replacement heifer areas
- offices, utility rooms, tool sheds
- drug cabinets, refrigerators, etc.

Private residences and vehicles are not included without the permission of the owner or their authorized agent.

An inspection report is required to be posted in a conspicuous location. This generally will be in the milkhouse or adjacent areas. Contact the Olympia office if you need to obtain a new copy of your inspection report.

Questions & Answers

Q1: **Can cows which have been treated with antibiotics be milked into the traditional milk bucket?**

A: Yes, if the milk bucket does not draw its vacuum directly from the milk line. The vacuum must come off a separate line. If the milk line is also your vacuum line, this is not acceptable because overflow from the bucket will go directly into the milk line. Ultimately, the safest method is to have separate herds for treated cows and untreated cows. The treated cows should be milked last with the line out of the milk tank or with completely separate equipment.

Q2: **What kinds of pesticides can I use and store in the milkhouse?**

A: Only pesticides with specific directions for use in the milkhouse can be used or stored in the milkhouse. All pesticides must have an EPA registration number on their labels. No pesticide, including automatic intermittent dispensers, can be used during milking time. All milk and milk contact surfaces must be protected during pesticide use.

Q3: **What are the cleaners and sanitizers requirements?**

A: All cleaners and sanitizers must bear a label which provides the product name, chemical description, use directions, precautionary statements, first aid instructions, container storage instructions, and the name and address of the manufacturer. This requirement pertains to the storage container and dedicated end-use containers only and does not generally apply to the transfer buckets, scoops, dippers, etc.

Q4: **Where should I store my milk filters?**

A: Strainer pads, parchment papers, gaskets, and similar single service articles must be protected against contamination and stored in a suitable, tightly sealed container or cabinet.

Q5: **Do I have to sanitize the teats of the cow before I attach the milker unit?**

A: Sanitizing of the teats shall not be required if the udder is dry and the teats have been thoroughly cleaned (not dry wiped) and dried (manually wiped dry) prior to milking. The regulatory agency determines what constitutes a dry udder and cleaned and dried teats.

Q6: **How often do I have to scrape the loafing shed or change cow bedding?**

A**:** Both must occur at a frequency necessary to maintain cleanliness of the facility and the cows.

Q7: **What are the requirements of an adequate hand wash station?**

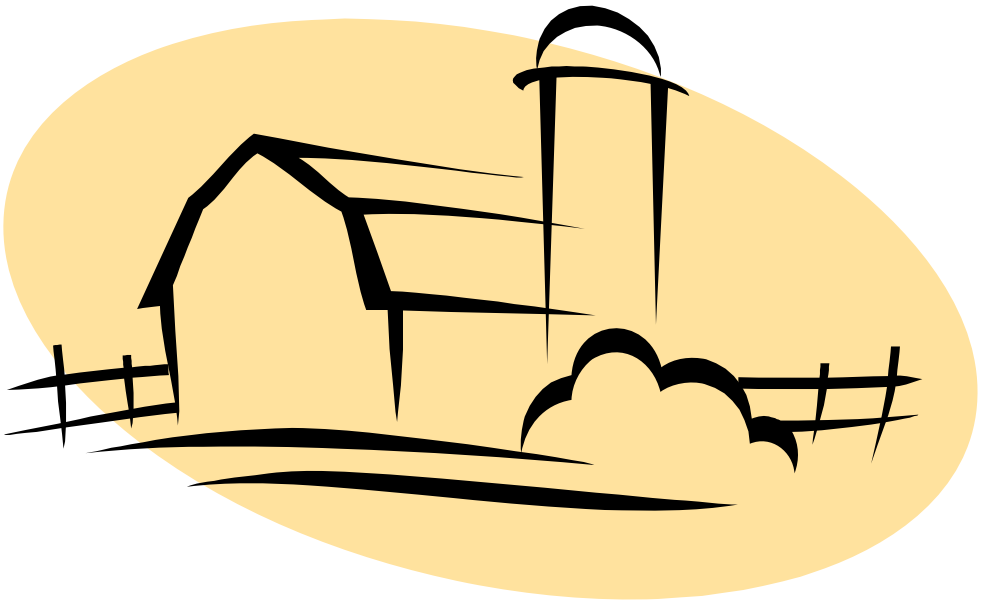
A: The hand wash station must have hot and cold or tempered running water as well as handsoap and single-service towels. It must be convenient to the milkhouse, milking barn, stable, parlor and toilet.

Q8: **What are the toilet room requirements?**

A: Toilet room requirements can be found in the PMO section 7r. If there is access to the residential toilet facilities, then no separate facility is required on the farm. Approved portable toilets are accepted.

Q9: **What should I do if I can not find the answer to my questions in the documents provided in the reference section?**

A: Any additional information may be obtain by contacting your Food Safety Officer for technical assistance.



Chapter 5: Compliance and Enforcement

Whenever possible, the Washington State Department of Agriculture (WSDA) Food Safety Program wishes to work with the food and beverage industry in accomplishing correction of violative conditions. We understand that clean, safe food is as much your goal as it is ours.

The WSDA Food Safety Program issues a Notice of Correction (NOC) for the following non-compliant conditions:

- Failing inspection
- Unsatisfactory water sample test results
- Milk sample results that test positive for antibiotics
- Bacterial or somatic cell counts that exceed state maximum allowance levels.

For habitual, recurring non-compliance with state laws and regulations, WSDA issues violating operations a Notice of Intent to Degrade or Notice of Intent to Revoke License (NOI). The department may also issue Notice of Intent to Assess Civil Penalty as an enforcement action option.

The WSDA Food Safety Program began using a new compliance enforcement system for a dairy farm inspections in 1996. Food Safety Officers score each inspection (except when *critical* violations are cited) based on the number of debit points cited for the *significant* violations. If farms have less than 90 points or if the inspector cites a *critical* violation a NOC letter will be issued.

The relative degree of an establishment's compliance with requirements of applicable laws, rules, and/or regulations will be based on the number and severity of violations noted on the inspection.

For routine inspections (not including Licensing inspections), farms are scored on a 100 point scale with some violations considered CRITICAL.

Critical violations are those violations that:

- Result in product adulteration that could cause injury or illness in consumers; OR
- Have the potential to contribute to conditions resulting in such adulteration.

The point value for each violation is shown on the Criteria and Debit Values sheet (see page 9).

Unless the director determines the risk to public health based on conditions noted at he establishment warrants summary suspension, embargo or other immediate action, a Notice of Correction is always sent to the establishment the first time it is found NOT to be in substantial compliance.

The NOC advises the establishment of the violations, asks it to furnish a written response of its corrective intent and warns that future violations may result in further action by the department, including licensing actions and/or civil penalty assessment.

A reasonable time will be allowed to provide opportunity for correction of the violations. Normally, a 30 day period from the receipt of the NOC is allowed for correction of violations, however the length of time allowed may vary based on the nature of the violation and the circumstances of the violation.

In accordance with chapter 43.05 RCW (Technical Assistance), the time period allowed for correcting the violations may be extended if the firm can show good reason for the extension and the firm requests such an extension in writing in a timely manner.

If upon reinspection, the establishment is found to be in substantial compliance, no further action is initiated by the department.

If upon reinspection, the establishment is found NOT to be in compliance:

- Another Notice of Correction is issued and another reinspection is conducted;

OR

- A Notice of Intent (NOI) to degrade, assess a civil penalty and/or take licensing action is issued.

Whether an NOI is issued depends on the circumstances, including:

- Degree of non-compliance,
- Efforts to correct violations, and
- Past compliance history.

Chapter 6: Farm Biosecurity Procedures

What is farm biosecurity?

Biosecurity refers to protecting the health of livestock by preventing the transmission of disease. Infectious diseases can be spread a number of ways. Some are spread by direct contact between animals, others can be spread by indirect contact, such as by a contaminated water bowl. Still others are spread by the wind, through insect bites, on people's contaminated clothing, in feed or water, or through contact with wildlife, including vermin. As a precaution in the prevention the possible spread of disease between sections of a single site, or between different sites or farms WSDA personnel will practice controls and procedures when performing all routine business. These precautions are intended to prevent WSDA personnel from becoming a vector or carrier of animal diseases, to prevent the spread of animal disease, and to set a good example for stockmen, growers and industry servicemen. If a firm has more restrictive controls, they will follow those in addition to our controls as long as they do not interfere with the performance of assigned duties.

Some of the precautions will include:

1. Maintaining a clean vehicle exterior.
2. Maintaining vehicle interiors clean and equipped with easily removable, rubber floor mats.
3. Arriving with clean outerwear, boots and equipment.
4. Wearing rubber boots or other suitable footwear, which can be cleaned and disinfected prior to departing.
5. Washing hands with soap and water upon arrival and departure.
6. Parking vehicles in the cleanest available area (cement, asphalt, areas without mud or manure).
7. Following a firm's sanitation program for employees.
8. Avoiding direct contact with livestock or pets.
9. Minimizing or avoiding animal housing or feeding areas, corrals, calf pens, hospital pens or special treatment facilities when possible.

Special precautions will be implemented in situations where known or suspected disease outbreaks or more notorious disease conditions exist. This may include the suspension of routine site visits and related duties until the risk becomes manageable.

Moderate risk visitors

People that travel from farm to farm, but have no direct contact with livestock pose a moderate risk for disease transmission. These would include salesmen, feed distributors, farm equipment mechanics, and various types of inspectors.

Recommended Precautions:

- Same precautions as above with additional requirements.
- Clean coveralls should be worn if there is any contact with feed, water, soil samples, manure or farm equipment
- Sampling equipment should be cleaned after each use.

- Soiled coveralls should be removed before entering the vehicle.

High risk visitors

These are visitors that travel from farm to farm and have direct, often intimate contact with livestock. These would include veterinarians, inseminators, processing crews, livestock haulers and neighbors.

Recommended Precautions:

- Same precautions as above with additional recommendations.

For more information on biosecurity you may check the following websites.

- United States Department of Agriculture - http://www.usda.gov
- Food & Drug Administration - http://www.fda.gov
- U.S. Department of Agriculture Animal and Plant Health Inspection Service (APHIS): http://www.aphis.usda.gov/vs/ceah/cahm/Dairy_Cattle/BAHMBiosecur.pdf
- US Centers for Disease Control (CDC) : www.cdc.gov
- University of California Davis Veterinary Medicine Extension: http://www.vetmed.ucdavis.edu/vetext/INF-DA/INF-DA_Biosecurity.html

Homeland Security

IN CASE OF EMERGENCY OR TO REPORT SUSPICIOUS ACTIVITIES PLEASE CALL WSDA AT 360-902-1876 DURING BUSINESS HOURS OR THE WASHINGTON STATE 24-HOUR ALERT & WARNING CENTER AT 1-800-258-5990.

You are our first line of defense because you take the first step in the emergency response process by making notification to the proper authorities. If you are a private company involved in any aspect of the agriculture industry you should ensure your employee's are aware and trained to recognize malicious intent, and that they understand how to report incidents properly.

For more information on notification response procedures for agricultural food safety and animal health incidents, please contact WSDA at 360-902-1876 or foodsafety@agr.wa.gov and request a copy of the procedures. Information may be reported online at http://www.nwwarn.gov and https://tips.fbi.gov . Additional information on Washington State citizen and business preparedness related to Homeland Security and terrorism can be found at http://emd.wa.gov, and click on the "*Homeland Security*" link.

Chapter 7: IMS Survey and Ratings

Washington participates in a voluntary interstate milk-shipping program. This is called the Interstate Milk Shippers (IMS) program. The IMS program establishes uniform reciprocity between states to prevent unnecessary restrictions of the interstate flow of milk and milk products.

State Rating Officers evaluate sanitation compliance and enforcement actions with the current requirements of the Grade A Pasteurized Milk Ordinance (PMO). The IMS rating officer compiles the scores of a group of farms and assigns a numerical sanitation rating and enforcement rating for the designated area.

Survey procedures

State rating officers will conduct surveys at a minimum of every 2 years. Farms are randomly selected. The total number selected will vary based on the size of the Bulk Tank Unit (BTU). The following is a breakdown of the number of farms surveyed based on the number of farms in the BTU:

Quantity of farms in BTU	Number to be surveyed
1-24	All
25-54	25
55-59	26
60-64	27
65-71	28
72-78	29
79-86	30

Compliance scores are calculated on a weighted average based on the amount of milk produced at each farm. Scores are based on an on site inspection, raw milk sample results and water sample results. A passing score is 90 points. If a BTU fails to score 90 or above, the raw milk is diverted away from Grade A use until a passing survey is completed.

Enforcement scores are a measure of the degree to which enforcement provisions of the *Grade A Pasteurized Milk Ordinance (PMO)* are being applied by the regulatory agency (e.g., inspection frequency, sample frequency for raw milk and water, inspections posted, records being properly maintained, etc.) If the enforcement score is below 90, appropriate action is taken against the receiving milk plant.

In addition to the state survey, the FDA Regional Milk Specialist will conduct a federal check rating every 3 years to asses the overall state procedures with enforcement provisions of the IMS Documents. Passing sanitation scores for these ratings are 80 or above. However, a state rating officer conducts a survey within 90 days if the sanitation score is between 80 and 84.

A survey or rating is not an inspection and no regulatory action is taken against an individual license based on the findings from a survey or rating.

Questions and Answers

Q1: **Will the amount of milk I ship affect the overall score?**
A: Yes. The sanitation is weighted according to the pounds or hundred weight (CWT) units shipped per day. For example, a dairy producer shipping 100,000 pounds per day carries 10 times the weight in the final compliance score compared to a dairy producer shipping 10,000 pounds per day.

Q2: **Who is involved in conducting the survey?**
A: Usually 2 people will be involved in the on-site farm survey. One person is the WSDA Food Safety Officer that routinely inspects your farm. The other person is the state survey officer or the FDA rating officer.

Q3: **Will a report be left?**
A: No. This is not an inspection. Survey findings may be discussed with the survey officer or the regular dairy farm inspector upon completion of the on-site survey or at a later date.

Q4: **When and how will I find out the results of the overall survey?**
A: The completed survey is usually sent to the BTU representative within a week after completion of the record review. Any inquiries should be directed to the BTU representative at that time.

Q5: **Are surveys conducted prior to the 2-year deadline?**
A: Yes. Surveys MUST be completed within the 2-year cycle and may be completed up to 6 months prior to that deadline.

Q6: **What qualifications does a state-rating officer maintain?**
A: The state survey officer is a Washington State Department of Agriculture employee who may also be a Food Safety Officer. The FDA certifies this person every 3 years to conduct state surveys.

Q7: **Is anything covered during a survey / rating not covered during the normal farm inspections?**
A: No. The scope of the survey and rating is the same as a normal farm inspection.

Q8: **If I am part of an IMS BTU, can I also sell my milk to a small cheese processor for additional income?**
A: Yes. However, all milk leaving an NCIMS listed dairy must be tested. This may cause complications and you should work with your FSO or contact the Food Safety Program.

Chapter 8: WSDA Programs and Other References

Livestock Nutrient Management Program

The Washington State Department of Agriculture (WSDA) is the responsible authority under the state Water Pollution Control Act for an effective water quality compliance program for dairies. Over the last 7 years, dairies have become well informed about good management practices to protect the state's surface and ground water and to manage their operations to meet state and federal livestock water quality rules.

The WSDA Livestock Nutrient Management Program's goal is to educate farmers about nutrient management and protecting waters of the state. Storage or application of manure too close to a stream can cause excess nutrients and fecal coliform to get into our water bodies. Proper storage and application of manure following a well-designed nutrient management plan (NMP) can provide an economical source of nutrient for crops, pasture, or hay lands.

Dairies are required to have an NMP to protect water quality from livestock nutrient discharges. Each basic function of the operation, production, collection, storage, transfer, treatment and field application is covered by the plan. The basis for nutrient management is sound agronomic use of solid and liquid manure. The Livestock Nutrient Management Program has inspectors that routinely inspect dairies for compliance with their nutrient management plans and preventing any discharges to surface and ground water.

For more information contact: Livestock Nutrient Management Program, 360-902-1982.

Animal Identification System

Animal Identification is a national program to identify animals and track their movement between premises. The information is used by Animal Health Officials to manage disease. The goal is to be able to identify where affected animals have been within 48 hours of confirmation of a disease outbreak or other animal health event.

WSDA began voluntary Premise Registration in January 2005. Knowing the locations of animal premises is vital to Animal Health Officials when they are managing an incident. A unique premise number is assigned to a location permanently. A premise number may be requested by the landowner, the producer using the land, or the person responsible for the animal operations, e.g., a herd manager. The premise number is assigned by the USDA National Premises Allocator system. Registration is voluntary.

To register a premise, WSDA needs your business name, the name of the location, an address or legal description, contact information (names, phone numbers) for use in an emergency, type of operation, and types of animals. Producers and business operators are responsible for keeping the Contact information up-to-date.

For more information contact: National Animal Identification System, 360-725-5493 or WSDA websitewww.agr.wa.gov and click on "Food & Animals"

References

Washington State Department of Agriculture: www.agr.wa.gov
- Food Safety Program 360-902-1876
- Livestock Nutrient Management Program 360-902-1982
- Organic Program 360-902-1805
- Animal Health Program 360-902-1878
- Feed and Fertilizer 360-902-2027
- Livestock Identification Program 360-902-1855

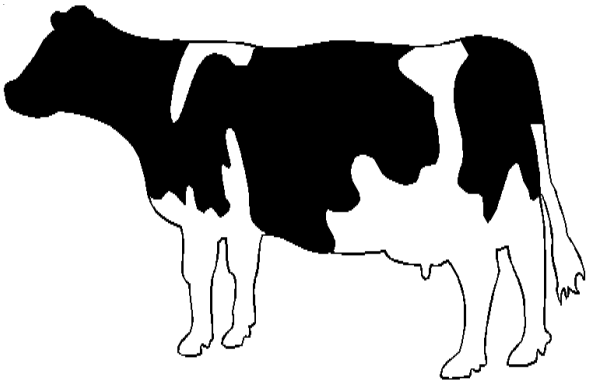
Washington Dairy Products Commission
4201 198th St. SW Ste. 101
Lynnwood, WA 98036
425-672-0687 (FAX) 425-672-0674
E-mail: info@havemilk.org
Home page: www.cowtv.com

Washington State Dairy Goat Council
PO Box 447
Snohomish, WA 98291
425-397-7777 (FAX) 425-742-9276

Washington State Dairy Herd Improvement Association
105 S. Pine Street
Burlington, WA 98233
800-526-2603 (FAX) 360-755-9580

Washington State Dairy Federation
PO Box 1768
Elma, WA 98541
360-785-3485 (FAX) 482-4069
Home page: www.wsdf.org

Milk Market Administrator, USDA
Building J, STE 102; 1930 –220th St SE
Bothell, WA 98021-8471
1-800-852-9557 (FAX) 425-487-2775



County Health Districts and Department

Adams County Health District	509-659-3315
Asotin County Health District	509-758-3344
Benton-Franklin Health District	509-943-2614
Chelan-Douglas Health District	509-886-6400
Clallam County Department of Health & Human Services	360-417-2274
Columbia County Public Health District	509-382-2181
Cowlitz County Health Department	360-414-5599
Garfield County Health District	509-843-3412
Grant County Health District	509-754-6060
Grays Harbor County Public Health & Social Services Dept	360-532-8665
Island County Health Department	360-679-7350
Jefferson County Health & Human Services	360-385-9400
Kitsap County Health District	360-337-5235
Kittitas County Health Department	509-962-7515
Klickitat County Health Department	509-773-4565
Lewis County Public Health	360-740-1223
Lincoln County Health District	509-725-1001
Mason County Department of Health Services	360-427-9670
Northeast Tri-County Health District	509-684-1301
Okanogan County Health District	509-422-7140
Pacific County Health and Human Services	360-875-9343
Public Health – Seattle and King County	206-296-4600
San Juan County Dept. of Health & Community Services	360-378-4474
Skagit County Department of Health	360-336-9380
Skamania County Health Department	509-427-5138
Snohomish Health District	425-339-5210
Southwest Washington Health District	360-397-8215
Spokane Regional Health District	509-324-1500
Tacoma-Pierce County Health Department	253-798-6500
Thurston County Public Health & Social Services Dept.	360-786-5581
Wahkiakum County Dept. of Health & Human Services	360-795-6207
Walla Walla County-City Health Department	509-527-3290
Whatcom County Health Department	360-676-6720
Whitman County Health Department	509-397-6280
Yakima Health District	509-575-4040
Washington State Assoc. of Local Public Health Officials	360-753-1886
Central Washington University	509-963-2252
Eastern Washington University	509-359-6496
University of Washington School of Public Health	206-543-1144
University of Washington Environmental Health & Safety	206-543-7262
Washington State University	509-335-3041
Washington State Board of Health	360-236-4100
Washington State Department of Health	360-236-4010

Notes and Records Section

APPENDIX D. STANDARDS FOR WATER SOURCES

I. LOCATION OF WATER SOURCES

DISTANCE FROM SOURCES OF CONTAMINATION

All ground water sources should be located a safe distance from sources of contamination. In cases where sources are severely limited; however, a ground water aquifer that might become contaminated may be considered for a water supply, if treatment is provided. After a decision has been made to locate a water source in an area, it is necessary to determine the distance the source should be placed from the origin of contamination and the direction of water movement. A determination of a safe distance is based on specific local factors described in the section on "Sanitary Survey."

Because many factors affect the determination of "safe" distances between ground water supplies and sources of pollution, it is impractical to set fixed distances. Where insufficient information is available to determine the "safe" distance, the distance should be the maximum that economics, land ownership, geology and topography will permit. It should be noted that the direction of ground water flow does not always follow the slope of the land surface. Each installation should be inspected by a person with sufficient training and experience to evaluate all of the factors involved.

Since safety of a ground water source depends primarily on considerations of good well construction and geology, these factors should be the guides in determining safe distances for different situations. The following criteria apply only to properly constructed wells, as described in this appendix. There is no safe distance for a poorly constructed well.

When a properly constructed well penetrates an unconsolidated formation, with good filtering properties, and when the aquifer itself is separated from sources of contamination by similar materials, research and experience have demonstrated that 15 meters (50 feet) is an adequate distance separating the two. Lesser distances should be accepted, only after a comprehensive sanitary survey, conducted by qualified State or local health agency officials, has satisfied the officials that such lesser distances are both necessary and safe.

If it is proposed to install a properly constructed well in formations of unknown character, the State or U.S. Geological Survey and the State or local health agency should be consulted.

When wells must be constructed in consolidated formations, extra care should always be taken in the location of the well and in setting "safe" distances, since pollutants have been known to travel great distances in such formations. The owner should request assistance from the State or local health agency.

The following table is offered as a guide in determining distances:

Table 10. Distance of Well from Sources of Contamination	
Formation	**Minimum Acceptable Distance of Well from Sources of Contamination**
Favorable (Unconsolidated)	15 meters (50 feet) – Lesser distances only on health department approval following comprehensive sanitary survey of proposed site and immediate surroundings.
Unknown	15 meters (50 feet) – Only after comprehensive geological survey of the site and its surroundings has established, to the satisfaction of the health agency, that favorable formations do exist.
Poor (Consolidated)	Safe distances can be established only following both the comprehensive geological and comprehensive sanitary surveys. These surveys also permit determining the direction in which a well may be located with respect to sources of contamination. In no case should the acceptable distance be less than 15 meters (50 feet).

EVALUATING CONTAMINATION THREATS TO WELLS

Conditions unfavorable to the control of contamination and that may require specifying *greater* distances between a well and sources of contamination are:

1. **Nature of the Contaminant:** Human and animal excreta and toxic chemical wastes are serious health hazards. Salts, detergents and other substances that dissolve in water can mix with ground water and travel with it. They are not ordinarily removed by natural filtration.

2. **Deeper Disposal:** Cesspools, dry wells, disposal and waste injection wells and deep leaching pits that reach aquifers or reduce the amount of filtering earth materials between the wastes and the aquifer increase the danger of contamination.

3. **Limited Filtration:** When earth materials surrounding the well and overlying the aquifer are too coarse to provide effective filtration, as in limestone, coarse gravel, etc., or when they form a layer too thin, the risk of contamination is increased.

4. **The Aquifer:** When the materials of the aquifer itself are too coarse to provide good filtration, as in limestone, fractured rock, etc., contaminants entering the aquifer through outcrops or excavations may travel great distances. It is especially important in such cases to know the direction of ground water flow and whether there are outcrops of the formation (or excavations reaching it) "upstream" and close enough to be a threat.

5. **Volume of Waste Discharged:** Since greater volumes of wastes discharged and reaching an aquifer can significantly change the slope of the water table and the direction of ground water flow, it is obvious that heavier discharges can increase the threat of contamination.

6. **Contact Surface:** When pits and channels are designed and constructed to increase the rate of absorption, as in septic tank leaching systems, cesspools and leaching pits, more separation from the

water source will be needed than when tight sewer lines or waste pipes are used.

7. **Concentration of Contamination Sources:** The existence of more than one source of contamination, contributing to the general area, increases the total pollution load and, consequently, the danger of contamination.

SANITARY SURVEY

The importance of a sanitary survey of water sources cannot be overemphasized. With a new supply, the sanitary survey should be made in conjunction with the collection of initial engineering data, covering the development of a given source and its capacity to meet existing and future needs. The sanitary survey should include the detection of all health hazards and the assessment of their present and future importance. Persons trained and competent in public health engineering and the epidemiology of waterborne diseases should conduct the sanitary survey. In the case of an existing supply, the sanitary survey should be made at a frequency compatible with the control of the health hazards and the maintenance of a good sanitary quality.

The information furnished by the sanitary survey is essential to complete the interpretation of bacteriological and frequently the chemical data. This information should always accompany the laboratory findings. The following outline covers the essential factors which should be investigated or considered in a sanitary survey. Not all of the items are pertinent to any one supply and, in some cases, items not in the list would be important additions to the survey list.

Ground Water Supplies:

a. Character of local geology and slope of ground surface.

b. Nature of soil and underlying porous strata; whether clay, sand, gravel, rock (especially porous limestone); coarseness of sand or gravel; thickness of water-bearing stratum; depth to water table and location, log and construction details of local wells in use and abandoned.

c. Slope of water table, preferably determined from observational wells or as indicated, presumptively, but not certainly, by the slope of ground surface.

d. Extent of drainage area likely to contribute water to the supply.

e. Nature, distance and direction of local sources of pollution.

f. Possibility of surface-drainage water entering the supply and of wells becoming flooded and methods of protection.

g. Methods used for protecting the supply against pollution by means of sewage treatment, waste disposal and the like.

g. Well construction:

(1) Total depth of well.

(2) Casing: diameter, wall thickness, material and lengths from surface.

(3) Screen or perforations: diameter, material, construction, locations and lengths.

(4) Formation seal: material (cement, sand, bentonite, etc.), depth intervals, annular thickness and method of placement.

i. Protection of well at top: presence of sanitary well seal, casing height above ground floor or flood level, protection of well vent and protection of well from erosion and animals.

j. Pumphouse construction (floors, drains, etc.), capacity of pumps and draw down when pumps are in operation.

k. Availability of an unsafe supply, usable in place of normal supply, hence involving danger to the public health.

l. Disinfection: equipment, supervision, test kits or other types of laboratory control.

Surface Water Supplies:

a. Nature of surface geology: character of soils and rocks.

b. Character of vegetation, forests, cultivated and irrigated land, including salinity, effect on irrigation water, etc.

c. Population and sewered population per square mile of catchment area.

d. Methods of sewage disposal, whether by diversion from watershed or by treatment.

e. Character and efficiency of sewage-treatment works on watershed.

f. Proximity of sources of fecal pollution to intake of water supply.

g. Proximity, sources and character of industrial wastes, oil field brines, acid mine waters, etc.

h. Adequacy of supply as to quantity.

i. For lake or reservoir supplies: wind direction and velocity data, drift of pollution and sunshine data (algae).

j. Character and quality of raw water: coliform organisms (MPN), algae, turbidity, color and objectionable mineral constituents.

k. Nominal period of detention in reservoirs or storage basin.

l. Probable minimum time required for water to flow from sources of pollution to reservoir and through reservoir intake.

m. Shape of reservoir, with reference to possible currents of water, induced by wind or reservoir discharge, from inlet to water-supply intake.

n. Protective measures in connection with the use of watershed to control fishing, boating, landing of airplanes, swimming, wading, ice cutting and permitting animals on marginal shore areas and in or upon the water, etc.

o. Efficiency and constancy of policing.

p. Treatment of water: kind and adequacy of equipment; duplication of parts; effectiveness of treatment; adequacy of supervision and testing; contact period after disinfection and free chlorine residuals carried.

q. Pumping facilities: pumphouse, pump capacity and standby units and storage facilities.

II. CONSTRUCTION

SANITARY CONSTRUCTION OF WELLS

The penetration of a water-bearing formation by a well provides a direct route for possible contamination of the ground water. Although there are different types of wells and well construction, there are basic sanitary aspects that must be considered and followed.

1. The annular space outside the casing shall be filled with a watertight cement grout or puddled clay from a point just below the frost line or deepest level of excavation near the well to as deep as necessary to prevent entry of contaminated water.

2. For artesian aquifers, the casing shall be sealed into the overlying impermeable formations so as to retain the artesian pressure.

3. When a water-bearing formation containing water of poor quality is

penetrated, the formation shall be sealed off to prevent the infiltration of water into the well and aquifer.

4. A sanitary well seal, with an approved vent, shall be installed at the top of the well casing to prevent the entrance of contaminated water or other objectionable material.

Well Casing or Lining: All that part of the suction pipe or drop pipe of any well within 3 meters (10 feet) of and below the ground surface shall be surrounded by a watertight casing pipe extending above the ground, platform or floor surface, as the case maybe, and covered at the top as herein provided. The casing of every well shall terminate above the ground level; the annular space outside the casing shall be filled with a watertight cement grout or clay, with similar sealing properties, from the surface to a minimum of 3 meters (10 feet) below the ground surface. A dug well, in lieu of a casing pipe, may be provided with a substantial watertight lining of concrete, vitrified tile with outer concrete lining, or other suitable material. Such lining shall extend at least 3 meters (10 feet) below the surface and shall extend up to the well platform or pump room floor with a watertight connection. In such case, the platform or floor shall have a suitable sleeve pipe, surrounding the suction pipe or drop pipe, and projecting above as herein provided for a casing pipe.

Well Covers and Seals: Every well shall be provided with an overlapping, tight-fitting cover at the top of the casing or pipe sleeve to prevent contaminated water or other material from entering the well.

The sanitary well seal, in a well exposed to possible flooding, shall be either watertight or elevated at least .6 meters (2 feet) above the highest known flood level. When it is expected that a well seal may become flooded, it shall be watertight and equipped with a vent line, whose opening to the atmosphere, is at least .6 meters (2 feet) above the highest known flood level.

The seal in a well not exposed to possible flooding shall be either watertight (with an approved vent line) or self-draining, with an overlapping and downward flange. If the seal is of the self-draining (non-watertight) type, all openings in the cover should be either watertight or flanged upward and provided with overlapping, downward flanged covers.

Some pump and power units have closed bases that effectively seal the upper terminal of the well casing. When the unit is the open type, or when it is located at the side (some jet- and suction-pump-type installations), it is especially important that a sanitary well seal be used. There are several acceptable designs consisting of an expandable neoprene gasket, compressed between two steel plates. They are easily installed and removed for well servicing. Pump and water well suppliers normally stock sanitary well seals.

If the pump is not installed immediately after well drilling and placement of the casing, the top of the casing should be closed with a metal cap screwed or tack welded into place, or covered with a sanitary well seal.

For large-diameter wells such as dug wells, it would be difficult to provide a sanitary well seal, consequently, a reinforced concrete slab, overlapping the casing and sealed to it with a flexible seal and/or rubber gasket, should be installed. The annular space outside the casing should first be filed with suitable grouting or sealing materials, i.e., cement, clay, or fine sand.

A well slab alone is not an effective sanitary defense, since it can be undermined by burrowing animals and insects, cracked from settlement or frost heave or broken by vehicles and vibrating machinery. The

cement grout formation seal is far more effective. It is recognized; however, that there are situations that call for a concrete slab or floor around the well casing to facilitate cleaning and improve appearance. When such a floor is necessary, it shall be placed only after the formation seal and the pitless installation have been inspected.

Well covers and pump platforms shall be elevated above the adjacent finished ground level. Pump room floors shall be constructed of reinforced, watertight concrete and carefully leveled or sloped away from the well, so that surface and waste water cannot stand near the well. The minimum thickness of such a slab or floor shall be 10 centimeters (4 inches). Concrete slabs or floors shall be poured separately from the cement formation seal and when the threat of freezing exists, insulated from it and the well casing by a plastic or mastic coating or sleeve to prevent bonding of the concrete to either.

All water wells shall be readily accessible at the top for inspection, servicing and testing. This requires that any structure over the well be easily removable to provide full, unobstructed access for well servicing equipment. The so-called "buried seal," with the well cover buried under several meter (yards) of earth, is unacceptable because:

1. It discourages periodic inspection and preventive maintenance;
2. It makes severe contamination during pump servicing and well repair more likely;
3. Any well servicing is more expensive; and
4. Excavation to expose the top of the well increases the risk of damage to the well, the cover, the vent and the electrical connections.

Well Pits and Drainage: Because of the pollution hazards involved, the well head, well casing, pump, pumping machinery, valve connected with the suction pump or exposed suction pipe shall not be permitted in any pit, room or space extending below ground level, or in any room or space above the ground, which is walled-in or otherwise enclosed, so that it does not have free drainage by gravity to the surface of the ground. *Provided,* that a dug well properly constructed, lined and covered, as herein prescribed, shall not be construed to be a pit. *Provided further,* that pumping equipment and appurtenances may be located in a residential basement, which is not subject to flooding. *And provided further,* that in the case of existing water supplies which otherwise comply with the applicable requirements of this appendix, pit installations may be accepted, under the following conditions, when permitted by the State water-control authority:

1. Pits shall be of watertight construction, with walls extending at least 15 centimeters (6 inches) above the established ground surface at all points.
2. Pits shall be provided with a watertight, concrete floor, sloping to a drain which discharges to the ground surface at a lower elevation than the pit, and preferably at least 9 meters (30 feet) from it; or if this should be impossible, to a watertight, concrete sump, in the pit, equipped with a sump-pump discharging to the ground surface, preferably at least 9 meters (30 feet) from the pit.
3. Pits shall be provided with a concrete base for pumps or pumping machinery, so that such units shall be located at least 30 centimeters (12 inches) above the floor of the pit.
4. Pits shall be provided with a watertight housing or cover in all cases.
5. If inspection should reveal that these conditions are not being properly maintained, the supply shall be disapproved.

Manholes: Manholes may be provided on dug wells, reservoirs, tanks and other similar features of water supplies. A manhole, if installed, shall be provided with a curb, the top of which extends at least 10 centimeters (4 inches) above the slab and shall be equipped, where necessary for physical protection, with a locked or bolted overlapping watertight cover. The sides of which extend downward at least 5 centimeters (2 inches). The covers shall be kept closed at all times, except when it may be necessary to open the manhole.

Vent Opening: Any reservoir, well, tank or other structure containing water for the dairy water supply may be provided with vents, overflows, or water-level control gauges, which shall be so constructed as to prevent the entrance of birds, insects, dust, rodents or contaminating material of any kind. Openings on vents shall be not less than 46 centimeters (18 inches) above the floor of a pump room, or above the roof or cover of a reservoir. Vent openings on other structures shall be at least 46 cm (18 inches) above the surface on which the vents are located. Vent openings shall be turned down and screened with corrosion-resistant screen of not less than 16 x 20 mesh. Overflow outlets shall discharge above and not less than 6 inches from a roof, roof drain, floor, floor drain or over an open water-supplied fixture. The overflow outlet shall be covered by a corrosion-resistant screen of not less than 16 x 20 mesh and by .6 centimeters (1/4-inch) hardware cloth, or shall terminate in a horizontal angle seat check valve.

DEVELOPMENT OF SPRINGS

There are two general requirements necessary in the development of a spring, used as a source of domestic water.

1. Selection of a spring with adequate capacity to provide the required quantity and quality of water for its intended use throughout the year.
2. Protection of the sanitary quality of the spring. The measures taken to develop a spring must be tailored to its geological conditions and sources.

The features of a spring encasement are the following:

1. An open-bottom, watertight basin intercepting the source which extends to bedrock or a system of collection pipes and a storage tank;
2. A cover that prevents the entrance of surface drainage or debris into the storage tank;
3. Provisions for the cleanout and emptying of the tank contents;
4. Provision for overflow; and
5. A connection to the distribution system or auxiliary supply. (See Figure 12).

A tank is usually constructed in place with reinforced concrete, of such dimensions, as to enclose or intercept as much of the spring as possible. When a spring is located on a hillside, the downhill wall and sides are extended to bedrock or to a depth that will insure maintenance of an adequate water level in the tank. Supplementary cutoff walls, of concrete or impermeable clay, extending laterally from the tank may be used to assist in controlling the water table in the locality of the tank. The lower portion of the uphill wall of the tank can be constructed of stone, brick or

other material, so placed that water may move freely into the tank from the formation. Backfill of graded gravel and sand will aid in restricting movement of fine material from the formation toward the tank.

The tank cover shall be cast in place to insure a good fit. Forms should be designed to allow for shrinkage of concrete and expansion of form lumber. The cover shall extend down over the top edge of the tank at least 5 centimeters (2 inches). The tank cover shall be heavy enough so that it cannot be dislodged by children and shall be equipped for locking.

A drain pipe with an exterior valve shall be placed close to the wall of the tank near the bottom. The pipe shall extend horizontally so as to clear the normal ground level at the point of discharge by at least 15 centimeters (6 inches). The discharge end of the pipe shall be screened to prevent the entrance of rodents and insects.

The overflow is usually placed slightly below the maximum water-level elevation and screened. A drain apron of rock shall be provided to prevent soil erosion at the point of overflow discharge.

The supply outlet, from the developed spring, shall be located at least 15 cm (6 inches) above the drain outlet and properly screened. Care shall be taken in casting pipes into the walls of the tank to insure good bond with the concrete and freedom from honeycomb around the pipes.

SANITARY PROTECTION OF SPRINGS

Springs usually become contaminated when barnyards, sewers, septic tanks, cesspools or other sources of pollution are located on higher adjacent land. In limestone formations; however, contaminated material frequently enters the water-bearing channels through sink holes or other large openings and may be carried along with ground water for long distances. Similarly, if material from such sources of contamination finds access to the tubular channels in glacial drift, this water may retain its contamination for long periods of time and for long distances.

The following precautionary measures will help to insure developed spring water of consistently high quality:

1. Provide for the removal of surface drainage from the site. A surface drainage ditch shall be located uphill from the source so as to intercept surface-water runoff and carry it away from the source. Location of the ditch and the points at which the water should be discharged are a matter of judgement. Criteria used should include the topography, the subsurface geology, land ownership and land use.
2. Construct a fence to prevent entry of livestock. Its location should be guided by the considerations mentioned in item 1. The fence shall exclude livestock from the surface-water drainage system at all points uphill from the source.
3. Provide for access to the tank for maintenance, but prevent removal of the cover by a suitable locking device.
4. Monitor the quality of the spring water with periodic checks for contamination. A marked increase in turbidity or flow after a rainstorm is a good indication that surface runoff is reaching the spring.

SURFACE WATER

The selection and use of surface water sources, for individual water supply systems, require consideration of additional factors not usually associated with ground water sources. When small streams, open ponds, lakes or open reservoirs must be used as sources of water supply, the danger of contamination and the consequent spread of

enteric diseases, such as typhoid fever and dysentery is increased. As a rule, surface water shall be used only when ground water sources are not available or are inadequate. Clear water is not always safe, and the old saying that running water "purifies itself", to drinking water quality, within a stated distance is false.

The physical and bacteriological contamination of surface water makes it necessary to regard such sources of supply as unsafe for domestic use, unless reliable treatment, including filtration and disinfection, is provided.

The treatment of surface water to insure a constant, safe supply requires diligent attention to operation and maintenance by the owner of the system.

When ground water sources are limited, consideration shall be given to their development for domestic purposes only. Surface water sources can then provide water needed for stock and poultry watering, gardening, fire-fighting and similar purposes. Treatment of surface water used for livestock is not generally considered essential. There is; however, a trend to provide stock and poultry drinking water which is free from bacterial contamination and certain chemical elements.

Where resort must be made to surface water for all uses, a wide variety of sources, including farm ponds, lakes, streams and the roof runoff of buildings may be considered. These sources are regarded, without exception, to be contaminated, and their use cannot be condoned unless an individually tailored treatment process can be used, which will make them safe and satisfactory. Such treatment may include aeration and the use of suitable filtration or precipitation devices to remove suspended matter, in addition to routine full-time disinfection.

The milk producer or milk plant operator, who is considering surface sources of water for milking, milkhouse and milk plant operations shall receive the advance approval of the regulatory agency and shall comply with all applicable requirements of the State water control authority on the construction, protection and treatment of the chosen supply.

NOTE: The U. S. Environmental Protection Agency publishes a *Manual of Individual Water Supply Systems* which is an excellent source of detailed information on the development, construction and operation of individual water systems and also contains a suggested well-drilling code.

III. DISINFECTION OF WATER SOURCES

All newly constructed or newly repaired wells shall be disinfected to counteract contamination introduced during construction or repair. Every well shall be disinfected immediately after construction or repair and flushed prior to bacteriological testing.

An effective and economical method of disinfecting wells and appurtenances is the use of calcium hypochlorite, containing approximately 70 percent available chlorine. This chemical can be purchased in granular form at hardware stores, swimming pool equipment supply outlets or chemical supply houses.

When used in the disinfection of wells, calcium hypochlorite should be added in sufficient amounts to provide a dosage of approximately 50 mg. available chlorine per liter in the well water. This concentration is roughly equivalent to a mixture of 1 gram (.03 ounce) of dry chemical per 13.5 liter (3.56 gallons) of water to be disinfected. A stock solution of disinfectant may be prepared by mixing 30 grams (1 ounce) of high-test hypochlorite with 2 liters (2 quarts)

of water. Mixing is facilitated if a small amount of the water is first added to the granular calcium hypochlorite and stirred to a smooth watery paste free of lumps. The stock solution should be stirred thoroughly for 10 to 15 minutes. The inert ingredients should then be allowed to settle. The liquid containing the chlorine should be used and the inert material discarded. Each 1.9 liter (2 quarts) of stock solution will provide a concentration of approximately 50 mg/l when added to 378 liters (100 gallons) of water. The solution should be prepared in a clean utensil. The use of metal containers should be avoided, as they are corroded by strong chlorine solutions. Crockery, glass or rubberlined containers are recommended.

Where small quantities of disinfectant are required and a scale is not available, the material can be measured with a spoon. A heaping tablespoonful of granular calcium hypochlorite weighs approximately 14 grams (1/2 ounce).

When calcium hypochlorite is not available, other sources of available chlorine such as sodium hypochlorite (12-15 percent of volume) can be used. Sodium hypochlorite, which is also commonly available as liquid household bleach with 5.25 percent available chlorine, can be diluted with two parts of water to produce the stock solution. 1.9 liter (2 quarts) of this solution can be used for disinfecting 378 liters (100 gallons) of water.

Stock solutions of chlorine in any form will deteriorate rapidly unless properly stored. Dark glass or plastic bottles with airtight caps are recommended. Bottles containing solution should be kept in a cool place and protected from direct sunlight. If proper storage facilities are not available, the solution should always be prepared fresh, immediately before use.

Complete information concerning the test for residual chlorine is included in the latest edition of *Standard Methods for the Examination of Water and Wastewater,* published by the American Public Health Association.

DUG WELLS

After the casing or lining has been completed, follow the procedure outlined below:

1. Remove all equipment and materials which will not form a permanent part of the completed structure.
2. Using a stiff broom or brush, wash the interior walls of the casing or lining with a strong solution (100 mg/l of chlorine) to insure thorough cleaning and sanitizing.
3. Place the cover over the well and pour the required amount of chlorine solution into the well through the manhole or pipe opening just before inserting the pump cylinder and drop-pipe assembly. The chlorine solution should be distributed over as much of the surface of the water as possible to obtain proper diffusion of the chemical through the water hose or pipeline as the line is being alternately raised and lowered. This method should be followed whenever possible.
4. Wash the exterior surface of the pump cylinder and drop pipe, with the chlorine solution, as the assembly is being lowered into the well.
5. After the pump has been set in position, pump water from the well and through the entire water distribution system to the milkroom until a strong odor of chlorine is noted.
6. Allow the chlorine solution to remain in the well for at least 24 hours.
7. After 24 hours or more have lapsed, flush the well to remove all traces of chlorine.

DRILLED, DRIVEN, AND BORED WELLS

After the casing or lining has been completed, follow the procedure outlined below:

1. Remove all equipment and materials which will not form a permanent part of the completed structure.
2. When the well is being tested for yield, the test pump should be operated until the well water is clear and as free from turbidity as possible.
3. After the testing equipment has been removed, slowly pour the required amount of chlorine solution into the well just before installing the permanent pumping equipment. Diffusion of the chemical with the well water may be facilitated as previously described.
4. Wash the exterior surface of the pump cylinder and drop pipe with chlorine solution as the assembly is being lowered into the well.
5. After the pump has been set in position, operate the pump until water discharge through the entire distribution system to waste has a distinct odor of chlorine. Repeat this procedure a few times, at 1-hour intervals, to insure complete circulation of the chlorine solution through the column of water in the well and the pumping equipment.
6. Allow the chlorine solution to remain in the well for at least 24 hours.
7. After 24 hours or more have elapsed, flush the well to remove all traces of chlorine. The pump should be operated until water discharged to waste is free from the chlorine odor.

In the case of deep wells having a high water level, it may be necessary to resort to special methods of introducing the disinfecting agent into the well so as to insure proper diffusion of chlorine throughout the well. The following method is suggested.

Place the granulated calcium hypochlorite in a short section of pipe capped at both ends. A number of small holes should be drilled through each cap or into the sides of the pipe. One of the caps should be fitted with an eye to facilitate attachment of a suitable cable. The disinfecting agent is distributed when the pipe section is lowered and raised throughout the depth of the water.

WATER-BEARING STRATA

Sometimes a well is encountered that does not respond to the usual methods of disinfection. A well like this has usually been contaminated by water that entered under sufficient head to displace water into the water-bearing formation. The displaced water carries contamination with it. The contamination that has been carried into the water-bearing formation can be eliminated or reduced by forcing chlorine into the formation. Chlorine may be introduced in a number of ways, depending on the construction of the well. In some wells, it is advisable to chlorinate the water and then add a considerable volume of a chlorine solution in order to force the treated water into the formation. When this procedure is followed, all chlorinated water should have a chlorine strength of approximately 50 mg/l. In other wells, such as the drilled well cased with standard weight casing pipe, it is entirely practicable to chlorinate the water, cap the well and apply a head of air. When air is alternately applied and released, a vigorous surging effect is obtained and chlorinated water is forced into the water bearing formation. In this procedure, the chlorine strength of the treated water, in the well, will be reduced by dilution as it mixes with the water in the water-bearing

formation. It is; therefore, advisable to double or triple the quantity of chlorine compound to be used so as to have a chlorine strength of 100 to 150 mg/l in the well as the surging process is started. After treating a well in this manner, it is necessary to flush it to remove the excess chlorine.

DISINFECTION OF SPRINGS

Springs and encasements should be disinfected by a procedure similar to that used for dug well. If the water pressure is not sufficient to raise the water to the top of the encasement, it may be possible to shut off the flow and thus keep the disinfectant in the encasement for 24 hours. If the flow cannot be shut off entirely, arrangements should be made to supply disinfectant continuously for as long a period as practicable.

DISINFECTION OF WATER DISTRIBUTION SYSTEMS

These instructions cover the disinfection of water distribution systems and attendant standpipes or tanks. It is always necessary to disinfect a water system before placing it in use under the following conditions:

1. Disinfection of a system which has been in service with raw or polluted water, preparatory to transferring the service to treated water.
2. Disinfection of a new system upon completion and preparatory to placing in operation with treated water or water of satisfactory quality.
3. Disinfection of a system after completion of maintenance and repair operations.

The entire system, including tank or standpipe, should be thoroughly flushed with water to remove any sediment which may have collected during operation with raw water. Following flushing, the system should be filled with a disinfecting solution of calcium hypochlorite and treated water. This solution is prepared by adding 550 grams (1.2 pounds) of high-test 70 percent calcium hypochlorite to each 3,785 liters (1,000 gallons) of water. A mixture of this kind provides a solution having not less than 100 mg/1 of available chlorine.

The disinfectant should be retained in the system, tank or standpipe, if included, for not less than 24 hours, then examined for residual chlorine and drained out. If no residual chlorine is found present, the process should be repeated. The system is next flushed with treated water and put into operation.

IV. CONTINUOUS WATER DISINFECTION

Water supplies which are otherwise deemed satisfactory, but which prove unable to meet the bacteriological standards prescribed herein, shall be subjected to continuous disinfection. The individual character of the supply shall be investigated and a treatment program developed which shall produce a safe supply as determined by bacteriological testing.

For numerous reasons, including economy, effectiveness, stability, ease of use and availability, chlorine is by far the most popular chemical agent employed for the disinfection of water supplies. This does not preclude the use of other chemicals or procedures demonstrated to be safe and effective. The amount necessary to provide adequate protection varies with the supply and the amount of organic and other oxidizable material which it contains. Proper disinfection can only be assured when a residual concentration of chlorine remains, for bactericidal activity, after the demands of these other substances are met.

In general, these factors exert the most important influences on the bactericidal efficiency of chlorine:

1. Free chlorine residual; the higher the residual, the more effective the disinfection and the faster the disinfection rate.
2. Contact time between the organism and the disinfectant; the longer the time, the more effective the disinfection.
3. Temperature of the water in which contact is made; the lower the temperature, the less effective the disinfection.
4. The pH of the water in which contact is made; the higher the pH, the less effective disinfection.

For example, when a high pH and low temperature combination is encountered in a water, either the concentration of chlorine or the contact time must be increased. Likewise, chlorine residual will need to be increased if sufficient contact time is not available in the distribution system before the water reaches the first user.

SUPERCHLORINATION–DECHLORINATION

Superchlorination: The technique of superchlorination involves the use of an excessive amount of chlorine to destroy quickly the harmful organisms which may be present in the water. If an excessive amount of chlorine is used, a free chlorine residual will be present. When the quantity of chlorine is increased, disinfection is faster and the amount of contact time required to insure safe water is decreased.

Dechlorination: The dechlorination process may be described as the partial or complete reduction of any chlorine present in the water. When dechlorination is provided in conjunction with proper superchlorination, the water will be both properly disinfected and acceptable to the consumer for domestic or culinary uses.

Dechlorination can be accomplished in individual water systems by the use of activated carbon (dechlorinating) filters. Chemical dechlorination by reducing agents such as sulphur dioxide or sodium thiosulfate can be used for batch dechlorination. Sodium thiosulfate is also used to dechlorinate water samples prior to submission for bacteriological examination.

DISINFECTION EQUIPMENT

Hypochlorinators are the most commonly employed equipment for the chemical elimination of bacteriological contamination. They operate by pumping or injecting a chlorine solution into the water. When properly maintained, hypochlorinators provide a reliable method for applying chlorine to disinfect water.

Types of hypochlorinators include positive displacement feeders, aspirator feeders, suction feeders and tablet hypochlorinators.

This equipment can be readily adapted to meet the needs of other systems of treatment, which require the regulated discharge of a solution into the supply.

Positive Displacement Feeders: A common type of positive displacement hypochlorinator is one which uses a piston or diaphragm pump to inject the solution. This type of equipment, which is adjustable during operation, can be designed to give reliable and accurate feed rates. When electricity is available, the stopping and starting of the hypochlorinator can be synchronized with the pumping unit. A hypochlorinator of this kind can be used with any water system. However, it is

especially desirable in systems where water pressure is low and fluctuating.

Aspirator Feeders: The aspirator feeder operates on a simple hydraulic principle that employs the use of the vacuum created when water flows either through a venturi tube or perpendicular to a nozzle. The vacuum created, draws the chlorine solution from a container into the chlorinator unit where it is mixed with water passing through the unit and the solution is then injected into the water system. In most cases, the water inlet line to the chlorinator is connected to receive water from the discharge side of the water pump, with the chlorine solution being injected back into the suction side of the same pump. The chlorinator operates only when the pump is operating. Solution flow rate is regulated by means of a control valve; pressure variations are known to cause changes in the feed rate.

Suction Feeders: One type of suction feeder consists of a single line that runs from the chlorine solution container, through the chlorinator unit and connects to the suction side of the pump. The chlorine solution is pulled from the container by suction created by the operating water pump.

Another type of suction feeder operates on the siphon principle, with the chlorine solution being introduced directly into the well. This type also consists of a single line, but the line terminates in the well below the water surface instead of the influent side of the water pump. When the pump is operating, the chlorinator is activated so that a valve is opened and the chlorine solution is passed into the well.

Tablet Chlorinator--These hypo-chlorinators inject water into a bed of concentrated calcium hypochlorite tablets. The result is metered into the pump suction line.

V. WATER RECLAIMED FROM THE CONDENSING OF MILK AND MILK PRODUCTS

Condensing water from milk evaporators and water reclaimed from milk and milk products may be reused in a milk processing plant. Acceptable uses of this water fall into three general categories:

1. Reclaimed water which may be used for all potable water purposes including the production of culinary steam.
2. Reclaimed water which may be used for limited purposes including the production of culinary steam.
3. Use of reclaimed water not meeting the requirements of this section.

Reclaimed water to be used for potable water purposes, including the production of culinary steam, shall meet the following requirements:

1. Water shall comply with the bacteriological standards of Appendix G, and, in addition, shall not exceed a total plate count of 500 per milliliter.
2. Samples shall be collected daily for two weeks following initial approval of the installation and semi-annually thereafter. *Provided*, that daily tests shall be conducted for one week following any repairs or alteration to the system.
3. The organic content shall be less than 12 mg/l as measured by the chemical oxygen demand or permanganate-consumed test; or a standard turbidity of less than 5 units.
4. Automatic fail safe monitoring devices shall be used to monitor and automatically divert (to the sewer) any water which exceeds the standard.
5. The water shall be of satisfactory organoleptic quality and shall

have no off-flavors, odors or slime formations.

6. The water shall be sampled and tested organoleptically at weekly intervals.

7. Approved chemicals, such as chlorine, with a suitable detention period, may be used to suppress the development of bacterial growth and prevent the development of tastes and odors.

8. The addition of chemicals shall be by an automatic proportioning device, prior to the water entering the storage tank, to assure satisfactory quality water in the storage tank at all times.

9. When chemicals are added, a daily testing program for such added chemicals shall be in effect and such chemicals shall not add substances that will prove deleterious to the use of the water or contribute to product contamination.

10. The storage vessel shall be properly constructed of such material that it will not contaminate the water and can be satisfactorily cleaned.

11. The distribution system, within a plant, for such reclaimed water shall be a separate system with no cross-connections to a municipal or private water system.

12. All physical, chemical and microbiological tests shall be conducted in accordance with the latest edition of *Standard Methods for the Examination of Water and Wastewater*.

Reclaimed water may be used for limited purposes including:

1. Production of culinary steam.

2. Pre-rinsing of the product surfaces where pre-rinses will not be used in food products.

3. Cleaning solution make-up water. Provided that for these uses items #3-11 of this section are satisfied and:

a. There is no carry-over of water from one day to the next, and any water collected is used promptly; or

The temperature of all water in the storage and distribution system is maintained at 63^{o}C (145^{o}F) or higher by automatic means; or

The water is treated with a suitable, approved chemical to suppress bacterial propagation by means of an automatic proportioning device, prior to the water entering the storage tank; and that,

b. Distribution lines and hose stations are clearly identified as "limited use reclaimed water"; and

c. Water handling practices and guidelines are clearly described and prominently displayed at appropriate locations within the plant; and

d. These water lines are not permanently connected to product vessels, without a break to the atmosphere and sufficient automatic controls, to prevent the inadvertent addition of this water to product streams.

Recovered water not meeting the requirements of this section may be used as boiler feedwater for boilers, not used for generating culinary steam, or in a thick, double walled, enclosed heat exchanger.

VI. WATER RECLAIMED FROM HEAT EXCHANGER PROCESSES

Potable water utilized for heat exchange purposes in plate or other type heat exchangers or compressors on Grade “A” dairy farms may be salvaged for the milking operation if the following criteria are met:

1. The water shall be stored in a storage vessel properly constructed of such material that it will not contaminate the water and be designed to protect the water supply from possible contamination.

2. The storage vessel shall be equipped with a drain and access point to allow for cleaning.

3. No cross-connection shall exist between this supply and any unsafe or questionable water supply or any other source of pollution.

4. There are no submerged inlets through which this supply may be contaminated.

5. The water shall be of satisfactory organoleptic quality and shall have no off flavors or odors.

6. The water shall comply with the bacteriological standards of Appendix G.

7. Samples shall be collected and analyzed prior to initial approval and semi-annually thereafter.

8. Approved chemicals, such as chlorine, with a suitable retention period, may be used to suppress the development of bacterial growth and prevent the development of tastes and odors.

9. When chemicals are added, a monitoring program for such added chemicals shall be in effect and such chemicals shall not add substances that will prove deleterious to the use of the water or contribute to product contamination.

10. If the water is to be used for the sanitizing of teats or equipment (backflush systems), approved sanitizers, such as iodine may be added by an automatic proportioning device located downstream from the storage vessel but prior to its end-use application.

NOTE:--The following figures 8-23 are taken from *The Manual of Individual Water Supply Systems*, Environmental Protection Agency publication number EPA-430-9-73-003.

VII. DRAWINGS OF CONSTRUCTION DETAILS FOR WATER SOURCES

Following are drawings showing the details of several types of water sources:

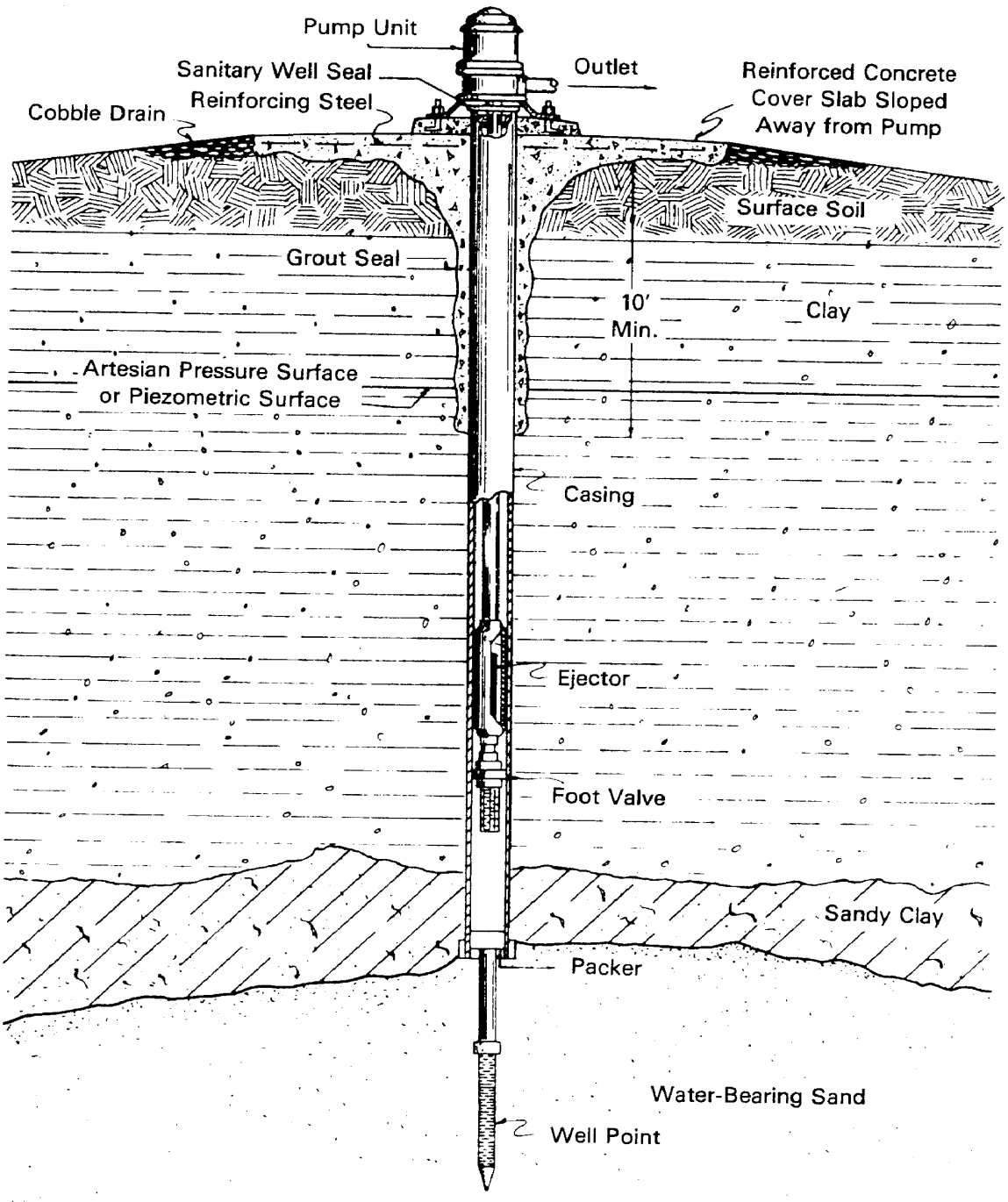


Figure 8. Bored Well with Driven Well Point

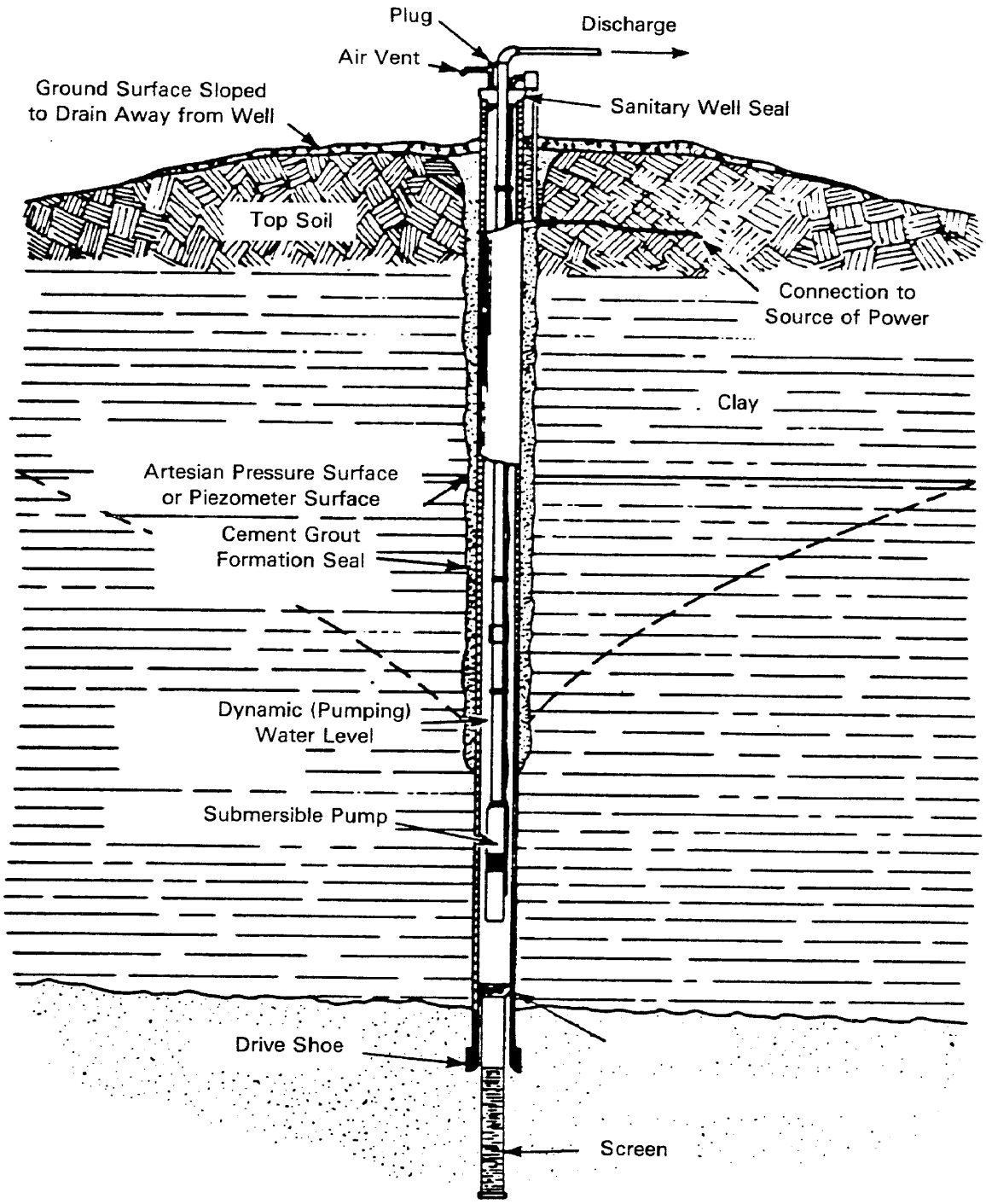


Figure 9. Drilled Well with Submersible Pump

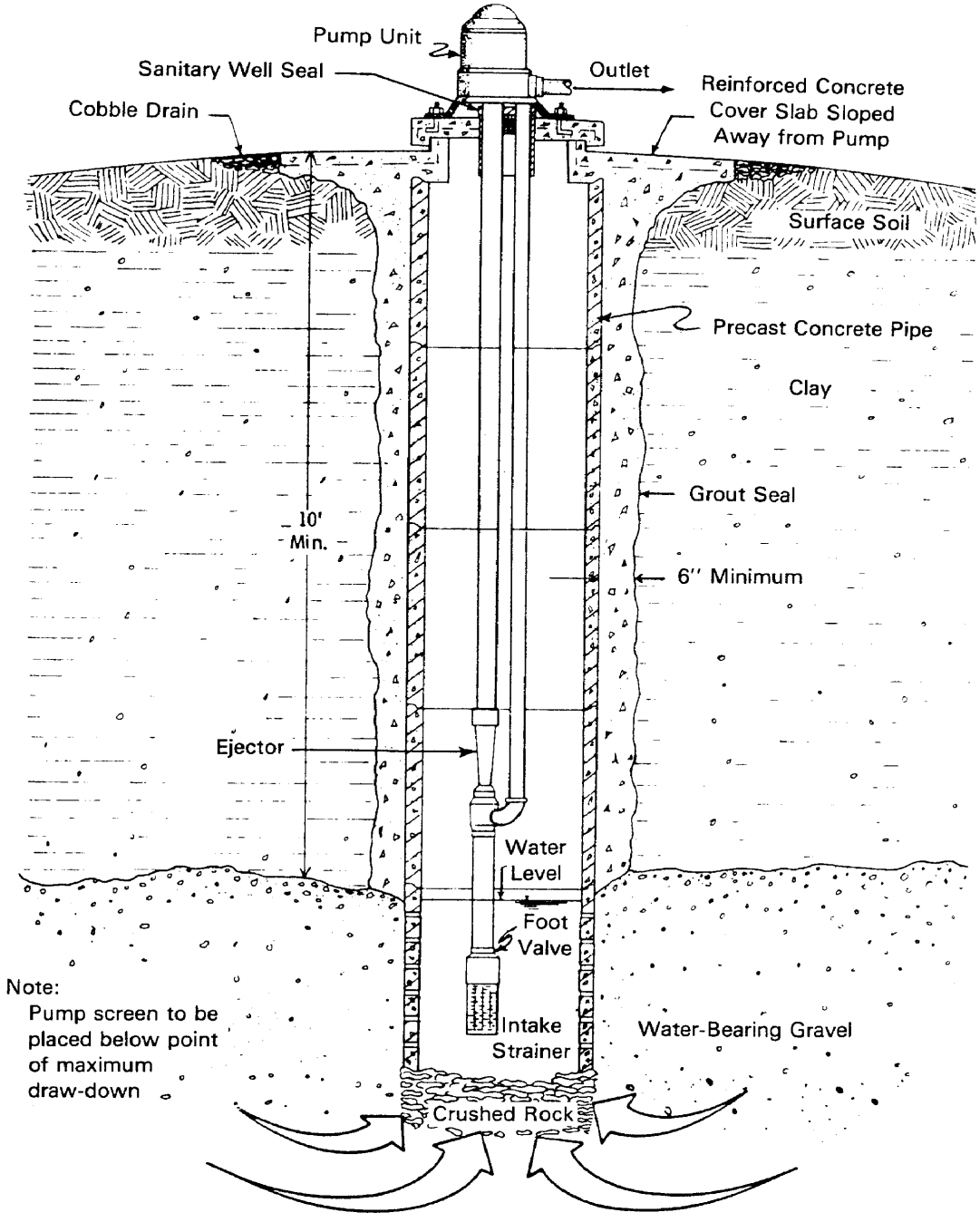


Figure 10. Dug Well with Two-Pipe Jet Pump Installation

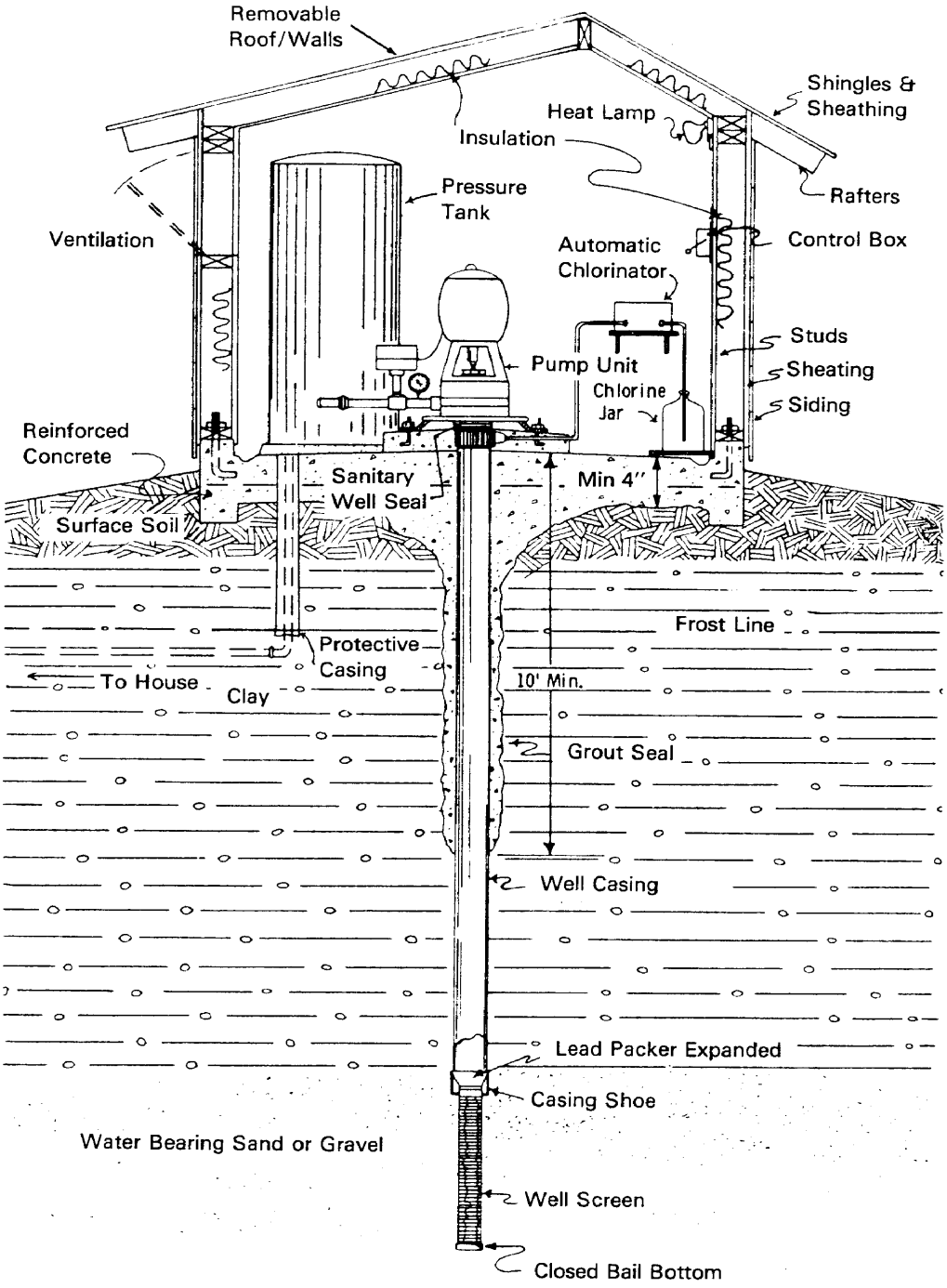


Figure 11. Pumphouse

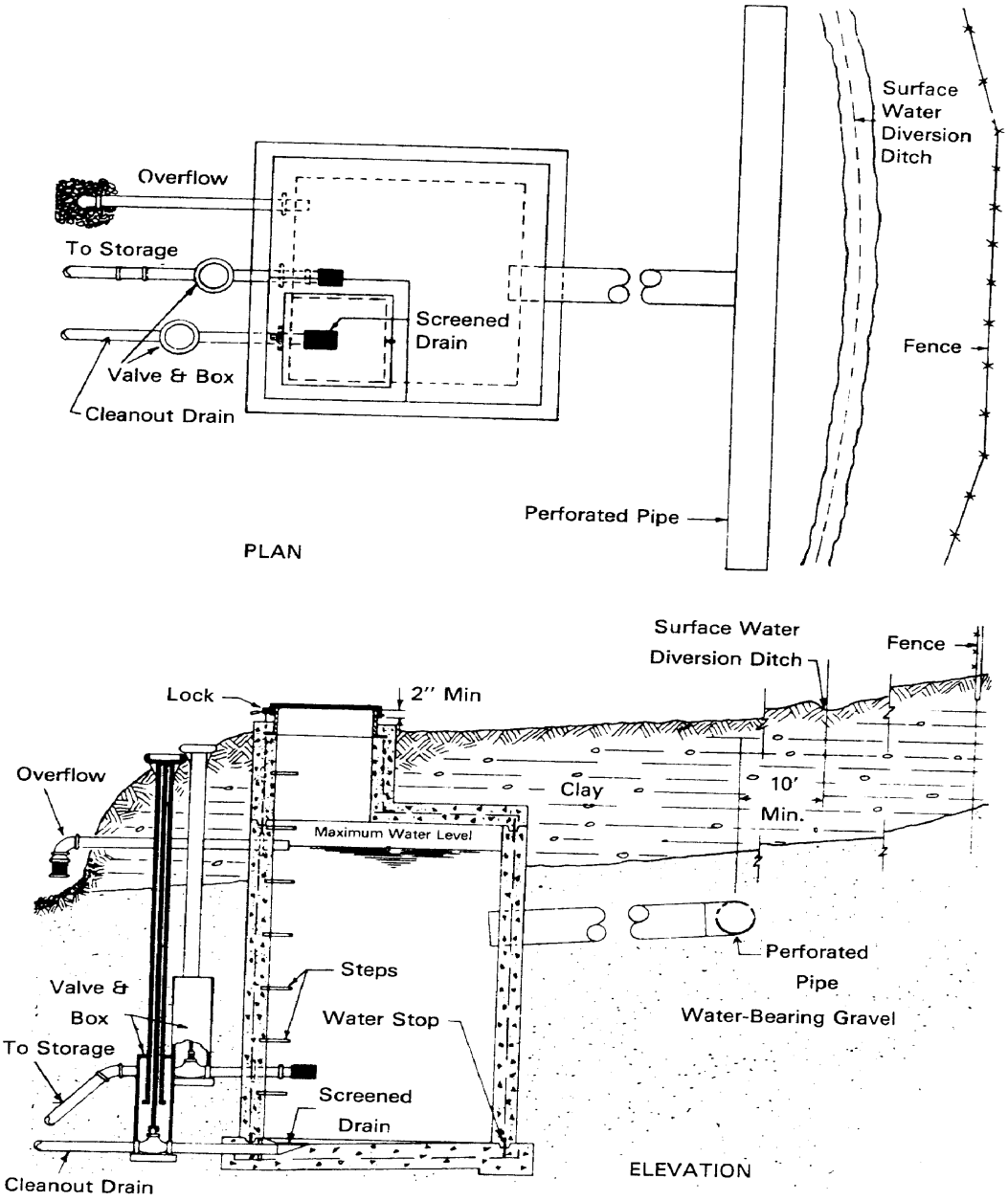


Figure 12. Spring Protection

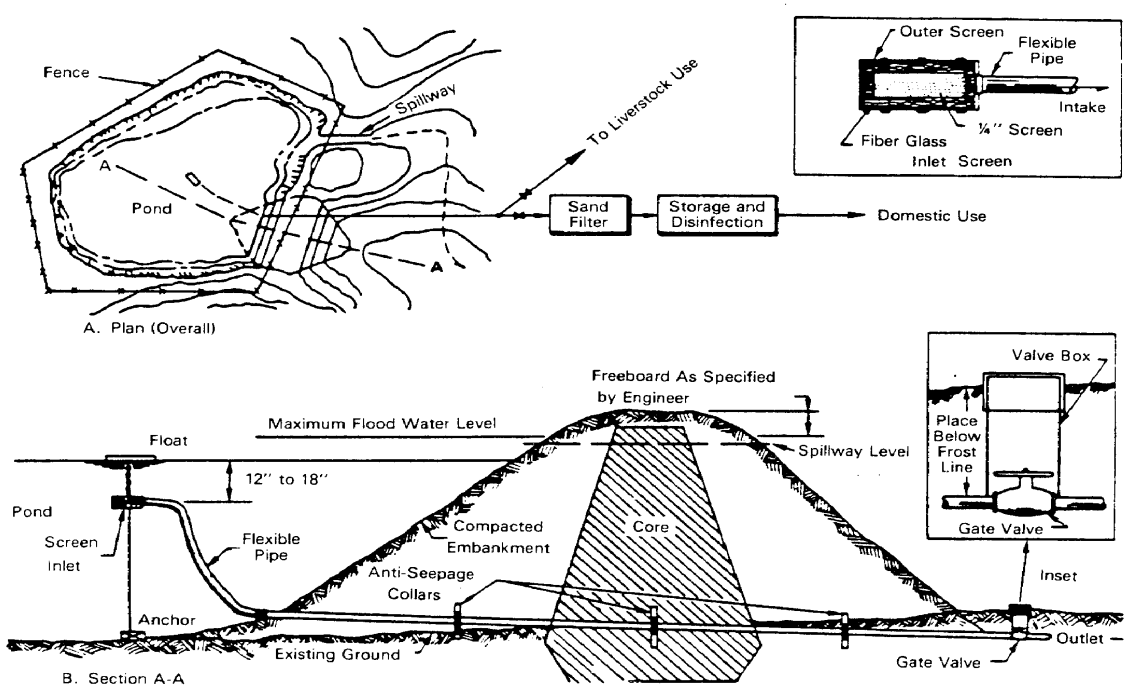


Figure 13. Pond

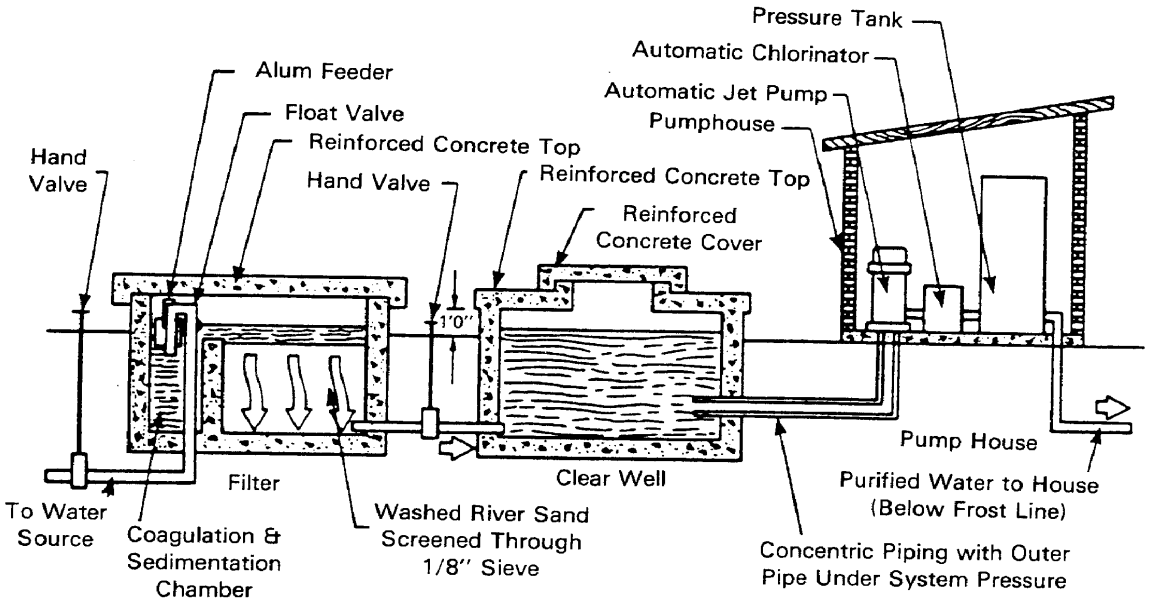


Figure 14. Schematic Diagram of a Pond Water-Treatment System

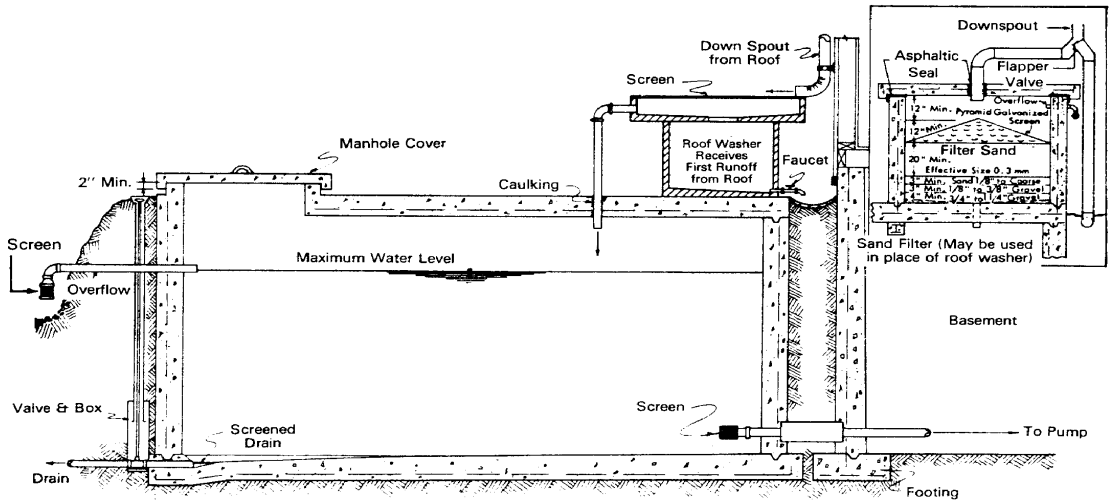


Figure 15. Cistern

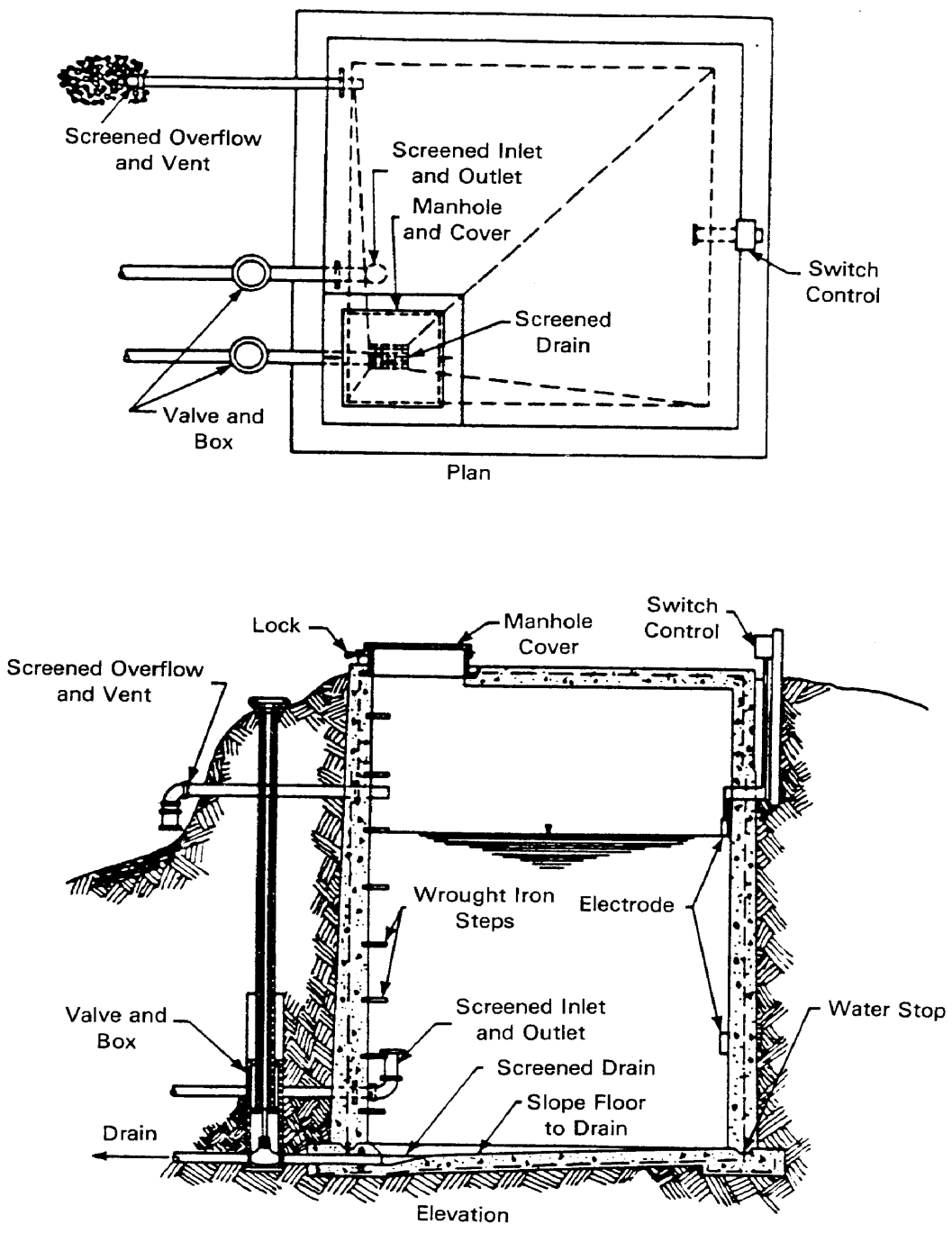


Figure 16. Typical Concrete Reservoir

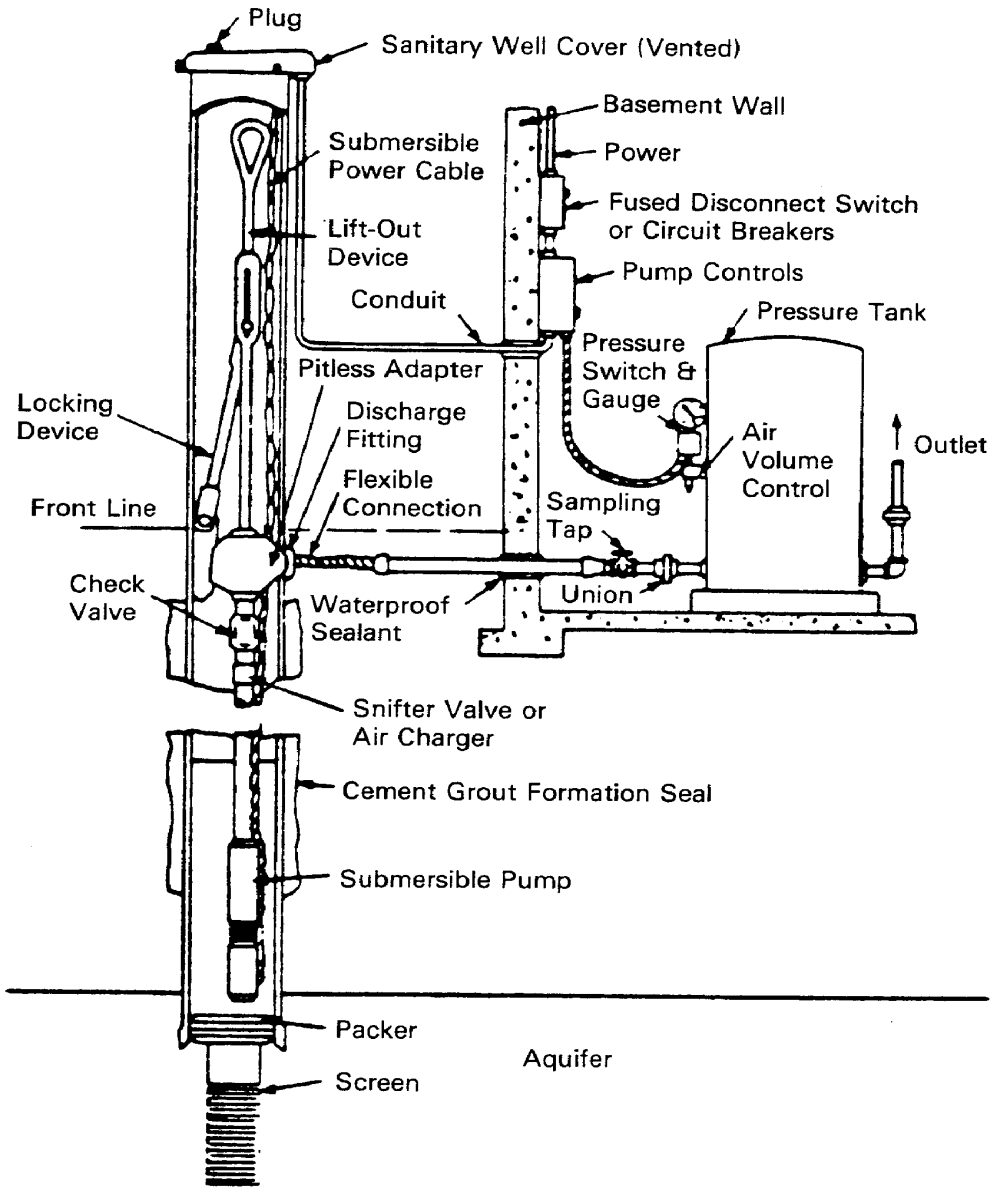


Figure 17. Pitless Adapter with Submersible Pump Installation for Basement Storage

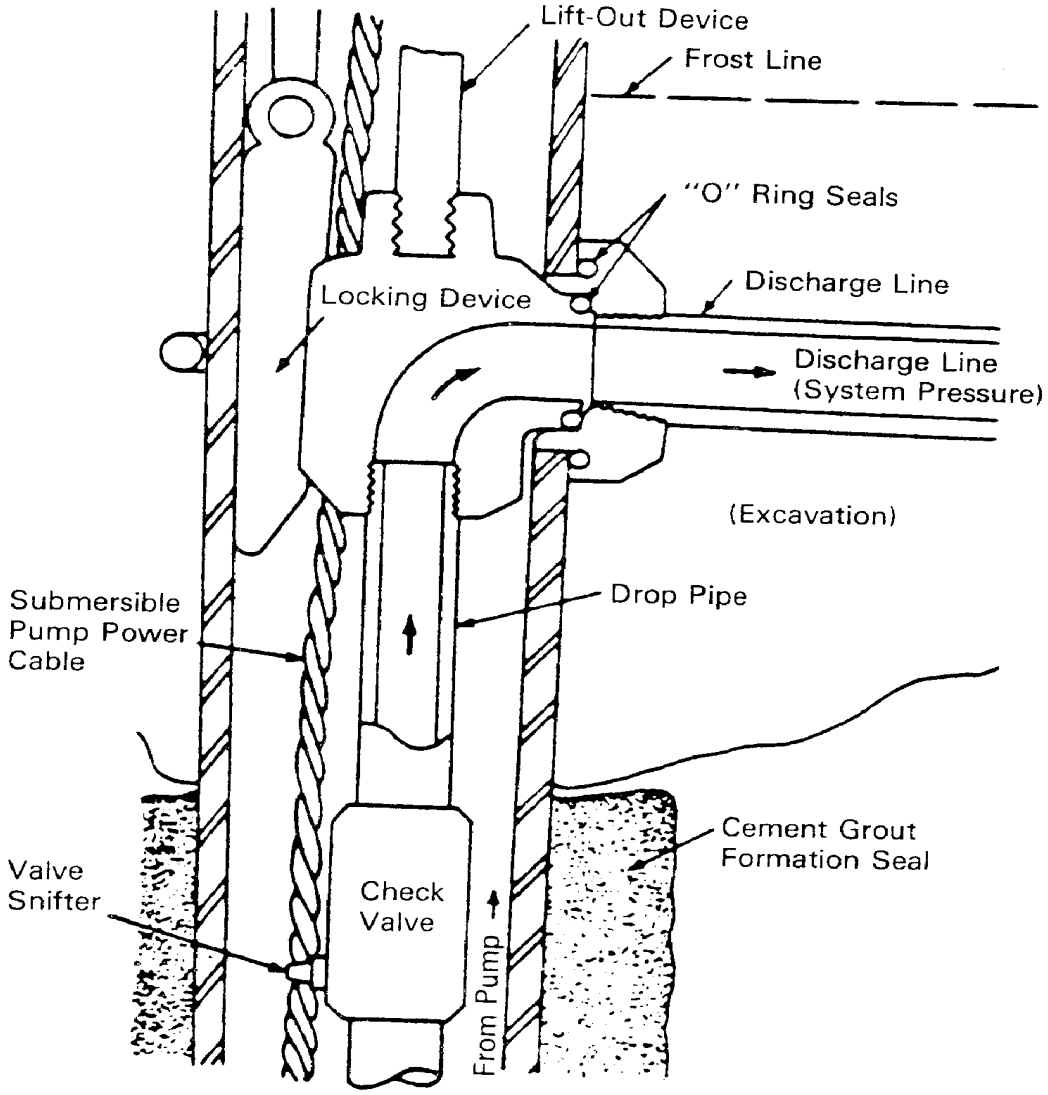


Figure 18. Clamp-on Pitless Adapter with Concentric External Piping for "Shallow Well" Pump Installation

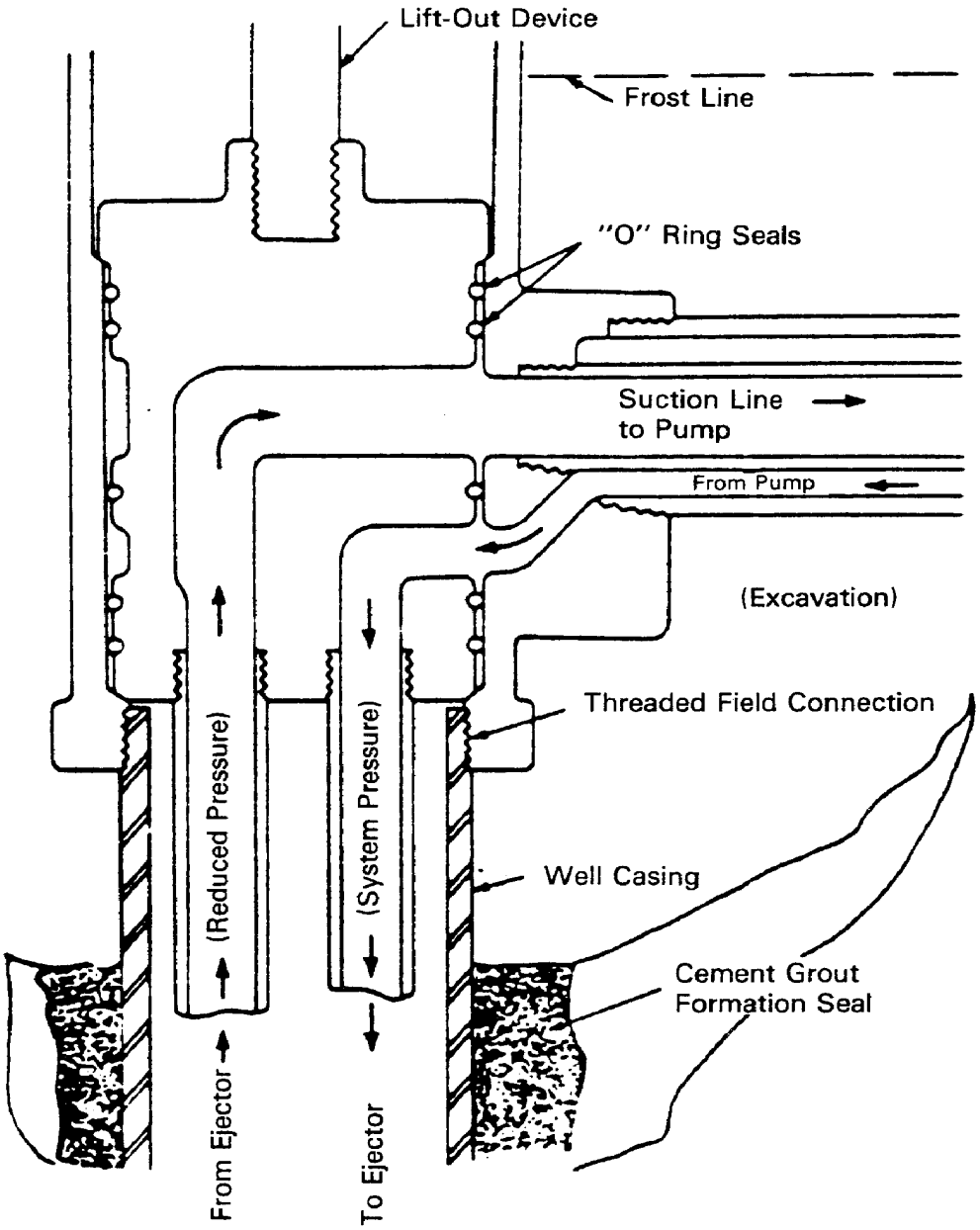


Figure 19. Pitless Unit with Concentric External Piping for Jet Pump Installation

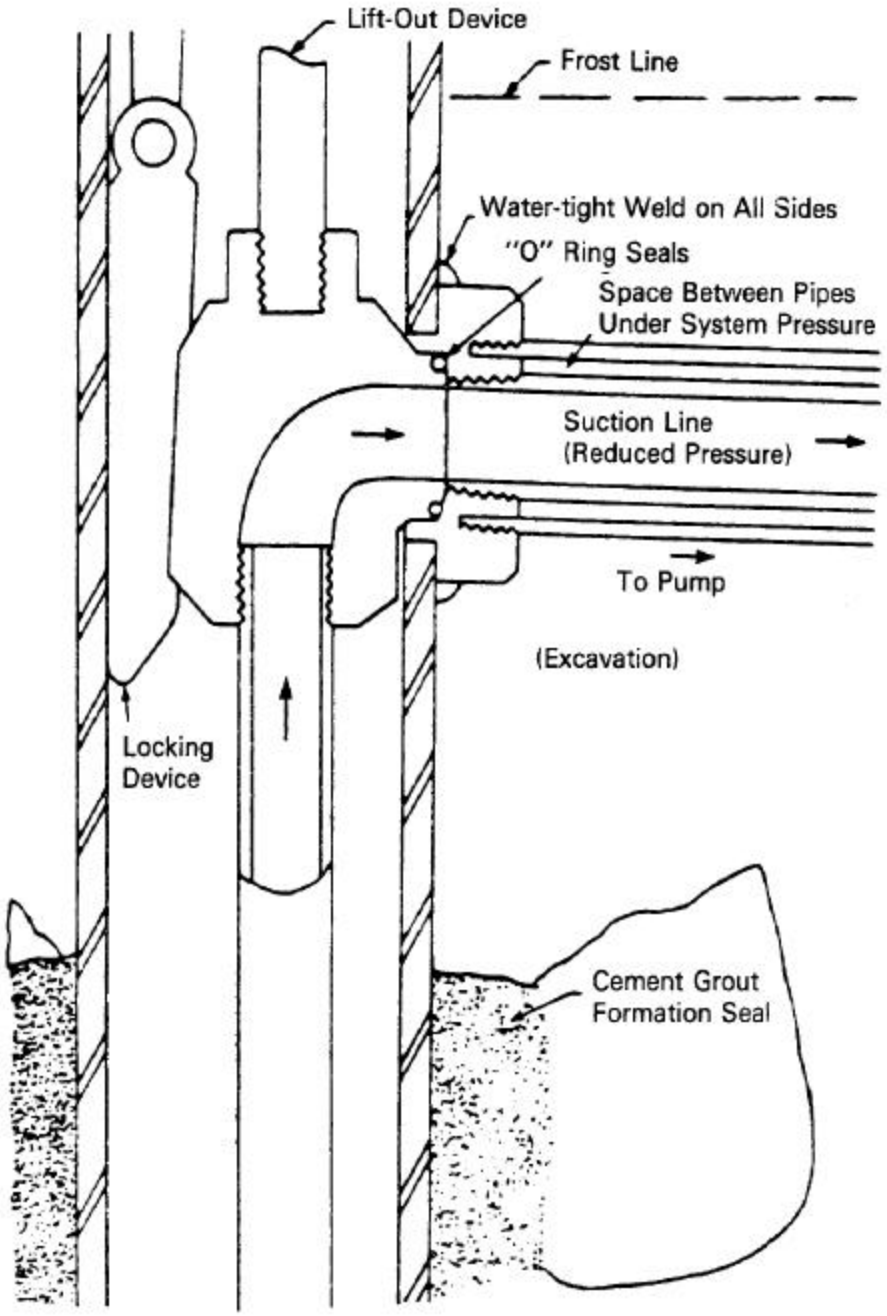


Figure 20. Weld-on Pitless Adapter with Concentric External Piping for "Shallow Well" Pump Installation

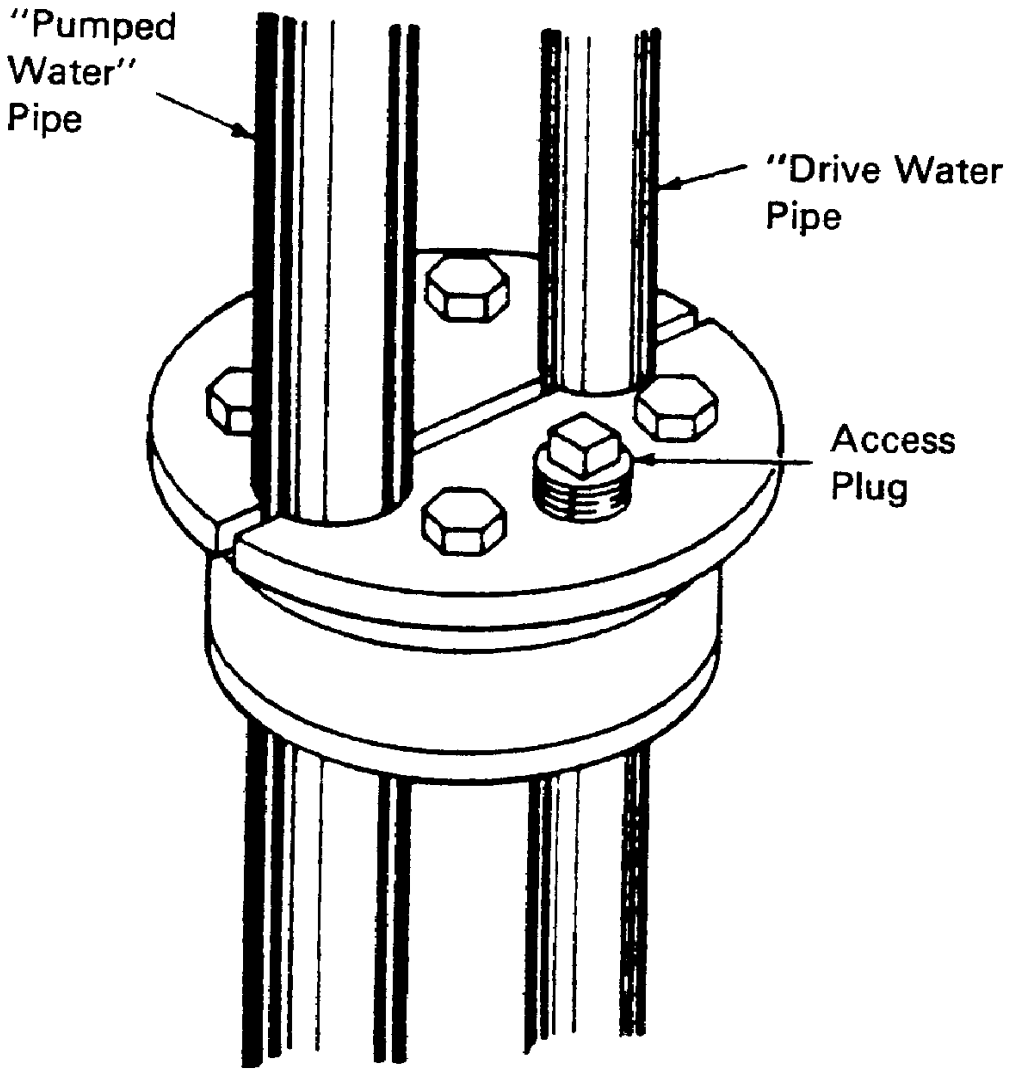


Figure 21. Well Seal for Jet Pump Installation

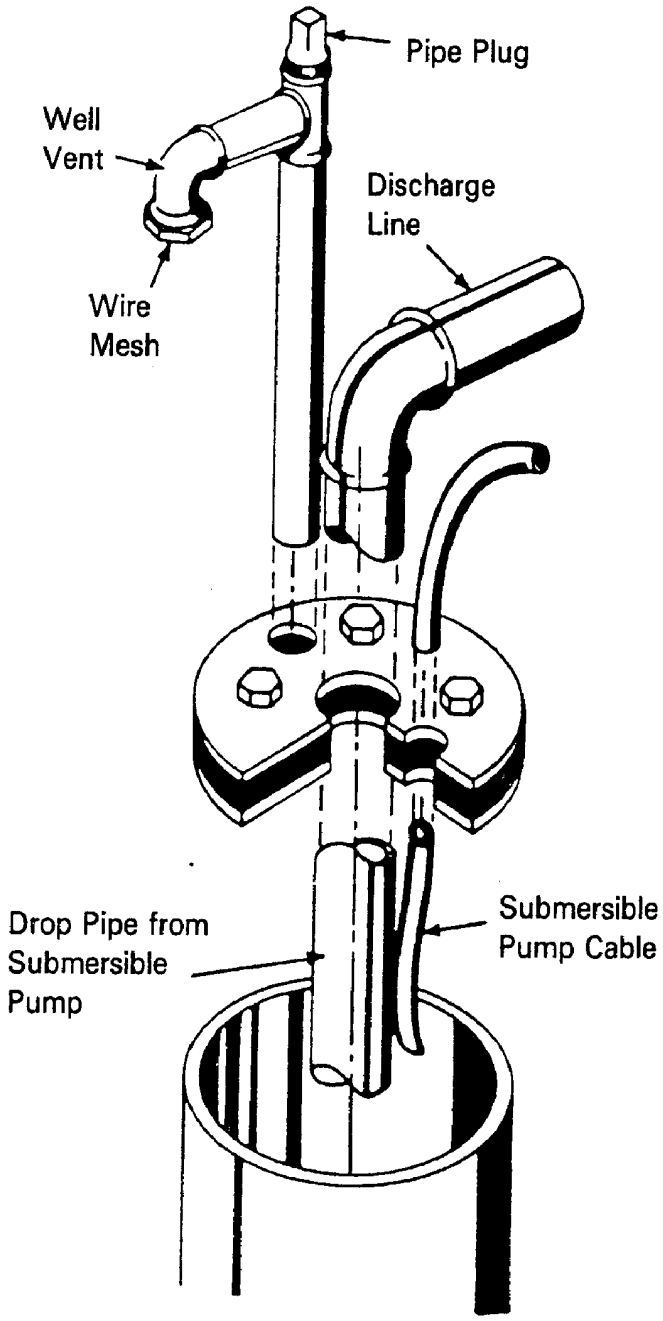


Figure 22. Well Seal for Submersible Pump Installation

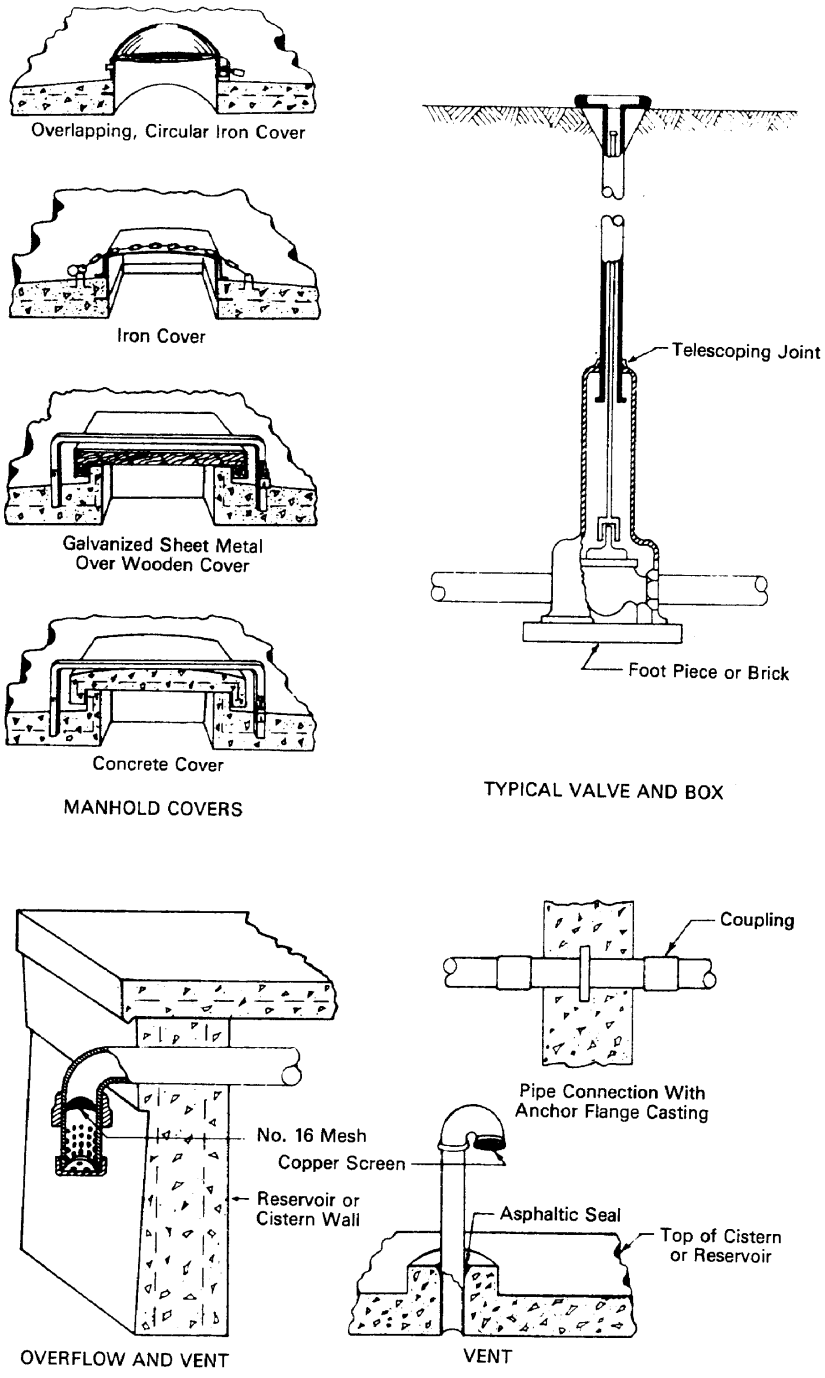


Figure 23. Typical Valve and Box, Manhole Covers, and Piping Installation

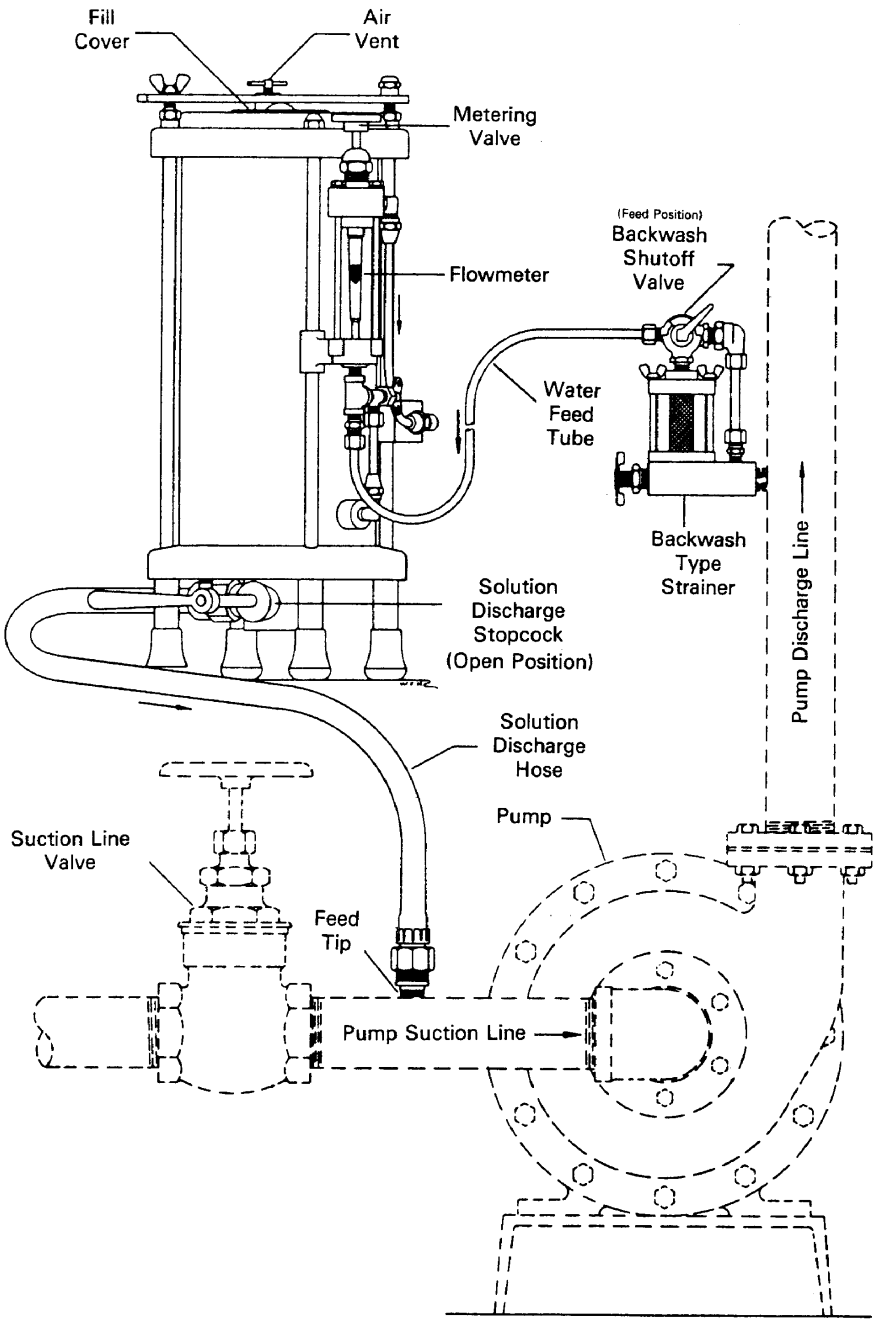


Figure 24. Suction Feeder

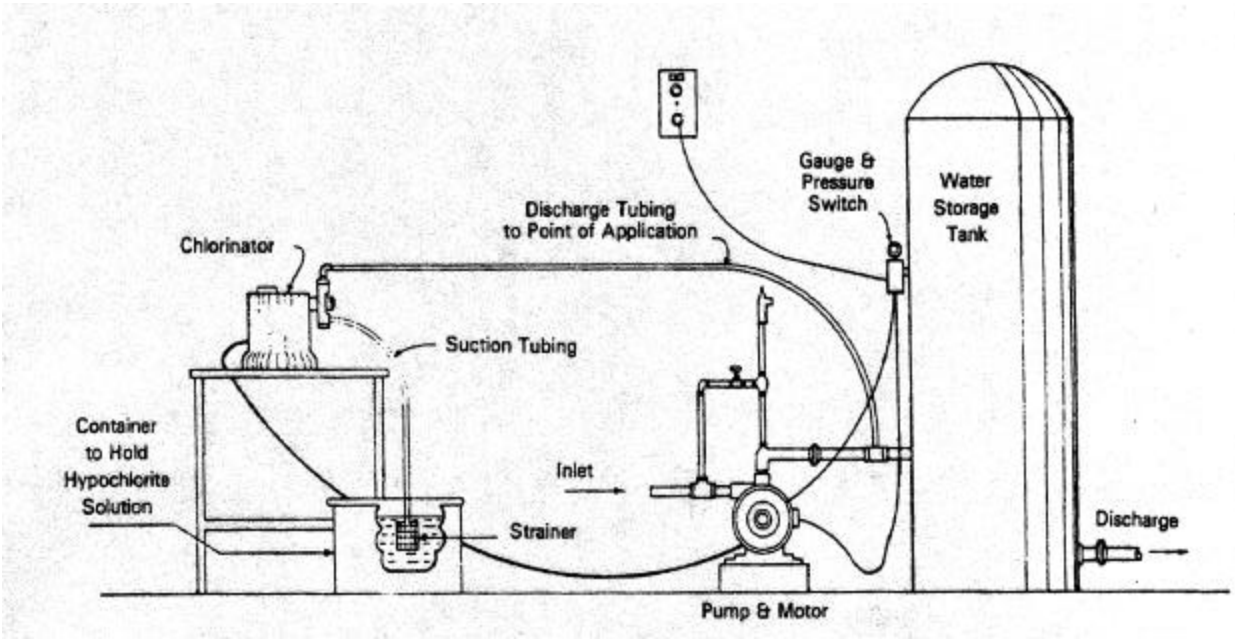


Figure 25. Positive Displacement Chlorinator