

APPENDIX 20

FSM 2500 - WATERSHED AND AIR MANAGEMENT
R-8 SUPPLEMENT 2500-92-1
EFFECTIVE 06/07/92

CHAPTER 2530 - WATER RESOURCE MANAGEMENT

2532.5 - Water Quality Monitoring.

1. Consider the following factors when evaluating the quality of natural swimming water:

- a. The results of bacteriological examinations of the water.
- b. User safety and water condition trends as exemplified by the occurrence of floating and bottom debris, the clarity and pH of water, and the depth of water.
- c. Information obtained by a sanitary survey of sources of pollution or contamination, and consideration of flow currents.
- d. Contamination introduced by the users themselves.
- e. Replenishment of water by streamflow and by wind and temperature currents.
- f. The intermittency of various sources of pollution or contamination.
- g. Reported incidence of eye, ear, nose or throat ailments following contact with the water.

2. Complete an onsite interdisciplinary study (sanitary survey) of an aquatic environment and adjacent areas. These surveys should reveal information regarding potential hazards which may or may not be demonstrated through water sample analyses from a single sample or short series of samples. Personnel conducting these surveys should be trained in environmental sanitation and experienced in making such surveys. Scheduling of sanitary surveys should meet the following criteria.

- a. Make an initial sanitary survey as soon as practical of all waters where swimming is specifically encouraged or permitted.
- b. Make a sanitary survey prior to the development of plans for each new swimming facility.
- c. Repeat a sanitary survey periodically in accordance with a prescribed schedule.

3. Make the survey:
 - a. At least once annually, immediately preceding the swimming use period.
 - b. Immediately following any major change or incident in use or activity (including fire, flood, or other natural disaster) in the watershed area above the swimming site during the swimming use period.

2532.51 - Plans of Operation. Water quality monitoring plans of operation for swimming waters must identify when follow-up actions are necessary. Implement these actions when bacteriological test reports of individual samples approach marginal safety levels or indicate the water is unsatisfactory. Exhibit 01 illustrates the minimum actions that are required as the result of bacteriological analysis for fecal coliform approaching marginal or unsatisfactory safety levels.

1. Monitoring Objective. Sample the quality of swimming waters to determine the acceptability of the water in terms of established water quality criteria for such use. These water quality criteria are designed to protect the health of the person who enters the water. Immersion in water or prolonged and intimate water contact involves considerable risk of ingested water in quantities sufficient to pose a significant health hazard, and of exposure to water-borne micro-organisms that can cause infections or disease. If water at these sites is also subject to other uses, the water samples may serve more than one purpose, provided they are analyzed against water quality criteria for those uses as well as against water quality criteria for swimming.

3. Monitoring Location. Prepare a map for each swimming site. Include the station location(s), identification of Storage and Retrieval (STORET) station codes and the preparation of station descriptions.

4. Data Requirements. The sampling and testing for bacterial water quality (fecal coliform) and flow estimate (streams and river) or lake/reservoir/pond levels are mandatory at all swimming sites. Use State standards for fecal coliform when they are more stringent than those listed in Exhibit 01.

The recommended frequency and sampling location for water pH and clarity are the same as the bacterial criteria. Make these tests concurrent with the collection of the bacterial sample at little additional cost.

Make tests for other biological pollutants and for chemical and physical character of the water periodically and when there is reason to suspect that water quality is not satisfactory for swimming purposes. The time and frequency of these tests will depend upon the vulnerability of the swimming water to pollution and contamination. In areas where the swimming waters flow from relatively undeveloped watersheds, a monthly sampling frequency during nonstorm periods may afford one basis for indicating sanitary conditions and the presence of contaminants other than fecal coliform in a stream or lake. Recognize that

concentrations of dangerous pollutants or contaminants can develop very rapidly, especially in slow moving or contained water subject to heavy use. Consider variations in site conditions as influenced by changes in hydrologic characteristics of the water body and number of visitors.

5. Monitoring Frequency. Make a minimum of five tests for fecal coliform at all established swimming sites during each 30-day period of the site use season. Use the State sampling frequency when State water quality standards specify a greater sampling frequency for each 30-day period.

Prepare a tabulation for each swimming site including the scheduled dates for bacteriological sampling and testing before the start of the use period.

Enter the time and date of actual field sampling on the tabulation. This will provide a means of verifying whether the water is tested as scheduled and can provide a means for correlation with the use.

6. Procedures. Specify the procedures used for collecting, processing, analyzing, interpreting and communicating water quality data for established swimming sites.

Specify handling procedures, including type of sampling equipment to be used, cooling requirements, and time limitations between sample collection and analyses. Assistance in developing these procedures can be obtained at offices of Environmental Protection Agency, Regional Administrator or from State public health officials.

Specify how the sample is to be collected. Swimming and other primary water contact use on lakes, ponds, and similar bodies of water are usually limited largely to areas near the shoreline. As a general guide, sample in the middle of each 200-foot section of swimming beach at a point from shore where the water is 4 feet deep. If the bottom gradient is such that the 4-foot depth is greater than 50 feet from the water's edge, or if use by small children is prevalent, additional samples should be taken where the water is 1 foot deep to check for possible contamination in areas used largely by waders.

Enter results and data of the bacteriological analyses onto the Environmental Protection Agency's STORET system in the manner prescribed by the Regional Forester upon receipt of laboratory reports for individual sites. Keep the laboratory reports on file at the originating unit for 5 years.

Make and document sanitary surveys as outlined previously. A satisfactory bacteriological report does not mean that the water has been continually safe since the last report, but represents the apparent condition at the time of sampling. A correlation of the sanitary survey with the bacteriological analyses gives meaning to the test results.

Review the tabulations for adherence to prescribed sampling schedule, the test results for compliance with standards, and the results of sanitary surveys, and take

such actions as are considered necessary to achieve the objectives. When a bacteriological report indicates tolerances are exceeded, initiate follow-up action immediately and document action. The primary purpose of this documentation is to establish a record of cause and effect to aid in identifying and correcting the source of contamination.

7. Data Analysis and Interpretation. Specify the technique(s) to be used for analyzing and interpreting the sampling results for swimming areas.

8. Reporting. Specify by Forest/District the position which prepares and receives the reports and when the reports should be prepared and received.

9. Quality Control. Specify the actions/responsibilities for training, safety equipment calibration, ensuring the integrity of data, analyses and interpretation.

10. Monitoring Cost. Specify the annual cost for monitoring swimming areas.

2532.51 - EXHIBIT 01

MINIMUM STANDARDS FOR FECAL COLIFORM
AND REQUIRED ACTIONS FOR SWIMMING AREAS 1/

Class Description	Fecal Coliform Organisms <u>2/</u> (per 100 milliliter sample)	Sanitary	Follow-up Survey
<u>Required</u>			
1	Acceptable Log mean 200 or less, <u>3/</u> sampling schedule	S	Continue regular not more than 1% of total samples during any period exceed 400.
30-day			
2	Acceptable S Increase <u>3/</u> frequency	Log mean 200 or less, but between 2-10% of total samples during any period exceed 400.	
30-day			
3	Acceptable Same as for Class 2	U	Correct
unsat- isfactory conditions & increase frequency of sampling			
4	Not accept- Log mean exceeds 200, or able; swim- more than 10% of total sam- pling areas ples during any 30-day swimming area period exceed 400. to remain and notify closed appropriate	S or U	Immediately close and
post			

until
health officials.
satisfac-
Investigate to
tory condi-
determine source
tions are
of contamination
verified by
and initiate
at least 5
corrective action.
consecutive
samples.

1/ These primary National standards are those set in Water Quality Criteria, 1968, 13th edition. If State or County standards have been established, the more stringent standards will apply.

2/ A minimum of five tests must be made during each 30-day period of the site use season, unless State requirements are more stringent.

3/ pH should be within the range of 6.5-8.3, except when due to natural causes, and in no case shall be less than 5.0 nor more than 9.0 (Water Quality Criteria, 1968, page 13). A pH meter is recommended for testing, but the colorimetric method using wide range pH indicator or narrow range (± 0.2) pH paper is acceptable. In the interest of public safety, swimming areas should be closed when the water clarity deteriorates below the 4-foot visibility criteria. This is often only a temporary condition following locally intense storms.