CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

RESOLUTION NO. 78-8

POLICY STATEMENT WITH RESPECT TO THE REGIONAL BOARD PROGRAM TO OPEN SAN FRANCISCO BAY SHELLFISH BEDS FOR DIRECT RECREATIONAL USE

I. Whereas, the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) adopted by this Board on April 8, 1975, identifies shellfishing as a beneficial use of San Francisco Bay; and

II. Whereas, Resolution 74-14, entitled "Policy Statement with Respect to the Implementation of Time Schedules for Facilities to Protect Shellfish" adopted on February 19, 1974, requires that wastewater treatment facilities protect shellfish and directs the Executive Officer to implement a program to determine whether shellfish beds are or will be adequately protected from point and nonpoint sources of discharge; and

III. Whereas, to date approximately $3,750,000 has been committed to provide wastewater treatment facilities specifically needed to protect shellfish; and

IV. Whereas, most point source dischargers will be completing new treatment facilities in the near future; and

V. Whereas, the Regional Board staff has prepared and distributed a proposed "Program to Open San Francisco Bay Shellfish Beds for Direct Recreational Use" to interested agencies for comment; and

VI. Whereas, there are unresolved shellfish management questions that should be addressed by the Department of Fish and Game to insure the enjoyable and orderly recreational use of shellfish beds considered for opening; and

VII. Whereas, research directed to finding ways to enhance the shellfish resource should be encouraged; and

VIII. Whereas, the Department of Fish and Game is best suited to conduct this type of research and to implement programs based on this research;

IX. Therefore be it resolved that this Regional Board approves the concepts and general outline of the "Program to Open San Francisco Bay Shellfish Beds for Direct Recreational Use" contained in Attachment 1 to this Resolution and discussed in the staff report contained in Attachment 2.

X. Be it further resolved that the Regional Board directs the Executive Officer to develop the details of the program, to implement the program, and if needed to amend or to modify the program in the future to increase its effectiveness consistent with the program's concepts and goal.

XI. Be it further resolved that the Regional Board requests that the Department of Fish and Game develop a shellfish management plan which will be coordinated with the Regional Board's shellfish program and which will consider in detail where and how shellfish beds may be opened for sportharvesting.

XII. Be it further resolved that the Regional Board encourages the Department of Fish and Game to conduct research on improving and creating new shellfish beds and that as appropriate they implement a program based on this research.

I, Fred H. Dierker, Executive Officer, do hereby certify that the foregoing is a full, ture, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on March 21, 1978.

FRED H. DIERKER
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

PROGRAM TO OPEN SAN FRANCISCO BAY SHELLFISH BEDS FOR DIRECT RECREATIONAL USE

BACKGROUND

The policy of the Regional Board expressed in Resolution No. 74-14 is to achieve the opening of San Francisco Bay shellfish beds for recreational use. Currently no commercial harvesting is permitted and limited, uncontrolled, recreational harvesting occurs without any assurance of the quality of the shellfish taken.

Municipal dischargers are in the process of upgrading sewage collection systems, treatment plants, and in some cases consolidating and building new deepwater outfalls to increase dilution and dispersion of treated wastewater and to minimize impact on shellfish beds. The coliform quality of the bay has improved markedly based on recent Regional Board surveys. Further improvements are expected as the Clean Water Grant Projects are completed.

The question now is how do we proceed to open shellfish beds.

The State Department of Health has to act on requests for commercial shellfish harvesting certificates based on the National Shellfish Sanitation Program. They may also quarantine a shellfish bed used for recreational harvesting and remove a quarantine when the beds are improved (Fish and Game Code Sections 5670 - 5674). The State Department of Health does not currently have a quarantine on the recreational harvesting of shellfish from the bay. Some local health departments, however, have beds posted as not being safe.

The goal of this program should be to determine the factors and conditions that may affect the safety of an area for direct recreational harvesting, what periodic monitoring would be necessary to detect adverse changes in water quality and shellfish safety which may require temporary closing of an area, and what additional control of point and nonpoint sources of contamination can be accomplished to minimize closing of an area.

The proposed plan of work to open shellfish beds contain three phases. As discussed in detail in the attached outline, Phase I (fiscal year 1977-78) includes a study to evaluate virus assay methods and a preliminary sanitary survey of a selected shellfish study area.

Phase II (fiscal year 1978-79) will apply the viral assay methods evaluated during Phase I to determine the significance of virus contamination of bay shellfish and the usefulness and constraints of coliform as an indicator of virus levels. This assessment will include monitoring virus from an approved commercial growing area, from a shellfish area with suspected viral contamination, and from the selected shellfish study area. During Phase II the selected shellfish study area and the point and nonpoint sources identified during Phase I will be monitored for coliform and trace metals and chlorinated hydrocarbons as needed. This information will help to establish cause and effect relationships between sources of contamination and contaminants which may be found in shellfish.

During Phase II the actual administrative procedures and program costs for the operation and surveillance of a shellfish bed will be developed. It is expected that the Regional Board and local health departments will play active roles in the actual operation of an open shellfish bed with advice and review by the State Health Department.

The studies of the selected shellfish area during Phases I and II will be submitted to the State and local health department for review. If there is substantial agreement that the direct harvesting of shellfish is safe under normal conditions of sewage treatment plant operations and dry weather, the shellfish study area will be posted as open by the local health department during the summer of 1980. This will initiate Phase III.

Phase III will include the actual ongoing surveillance and administrative operation of the study shellfish area for direct recreational use and a program for surveying and opening additional beds. As other shellfish beds are opened, Phase III will change into a continuous, ongoing program of surveillance, monitoring and operation of open, recreational beds. We expect the Regional Board will play a lead role in these activities.

SHELLFISH IMPLEMENTATION PROGRAM

Phase I, April 1978 - May 1979

I. Virus Study

A. Purpose: Largely a laboratory study to evaluate reliable methods of assaying viruses which will be applied to a field study of San Francisco Bay shellfish during Phase II.

B. Tasks: The broad objectives of the study are

1. to evaluate and/or develop methods for the viral assay of the various important types of shellfish present in San Francisco Bay,

2. to evaluate and/or develop a method for the analysis of Bay water and sediment for the presence of virus,

3. to determine the rate of uptake of viruses by selected species of shellfish, and

4. to examine the ability of San Francisco Bay shellfish to clear themselves of viruses when placed in uncontaminated water.

C. Management: The study will be contracted out under State Board direction.

D. Timing: Date of contract approval for twelve (12) months (approximately April 1978 - April 1979). Final report due approximately June 1979.

II. Preliminary sanitary survey of one shellfish area

A. Purpose: To gather information on one study area that can be used to develop an intensive survey during Phase II.

B. Tasks:

1. Point and nonpoint discharges

a. Descriptions and maps of municipal and industrial discharge locations.

b. Descriptions and maps of possible sewage bypass locations

1) Rate of possible bypassing and past incidents, if any, during previous five (5) years.

2) Review maintenance schedule and plans to upgrade sewage collection system.

c. Descriptions and maps identifying storm drain locations, direction of flow, pump locations, if any, and watersheds tributary to each drain.

1) Descriptions and maps of locations of industries along storm drains which could have chemical spills reaching the drains.

a) Description of industry.

b) Description of possible chemicals and volumes of potential spills.

c) For spills that reached storm drains during the past five (5) years, identify location of spill, industries involved, volume, type of substances, causes, and extent of area affected.

2) Location and maps of locations of freeways and highways and their drainage connections to storm drains.

3) For highway transit connected spills that reached storm drains during the last five (5) years, identify location of spill, volume, type of substance, and extent of area affected.

d. Identify location of marinas and areas of boat use within the vicinity of the study bed.

2. Evaluate available information on the reliability of treatment and quality of point-source effluents and nonpoint source discharges in the vicinity of the shellfish study area.

3. Conduct coliform sampling surveys of shellfish study area and storm drains during a wet weather runoff period, a dry weather period, and a period of bypassing or discharge of unchlorinated sewage, if any occurs in the vicinity of the shellfish study area during the study period.

a. Sample water every day for two weeks during survey period.

b. Sample twice a day at both high water slack tide and low water slack tide during the first week of each survey. Sample once a day at approximately the same time each morning during the second week of each survey.

c. Sample shellfish meat for coliform once a week during survey periods.

4. Evaluate the dilution and dispersion of point and nonpoint sources of discharge.

   a. Evaluate existing data on dilution and dispersion.

   b. Determine which treatment plants could affect study shellfish area and other beds in the vicinity during discharge of raw sewage or unchlorinated wastewater.

   c. Conduct mathematical modeling, calibrate and verify model.

      1) Determine fastest time water exceeding coliforms standards could reach shellfish study area and other beds in the vicinity for various type of treatment plant upsets for various hydro-dynamic conditions.

      2) Determine the accumulative concentration dilution at the shellfish study area and other beds in the vicinity

C. Management:

1. The Regional Board staff will perform tasks Nos. 1 through 3 in house.

2. Task No. 4 will be contracted out under Regional Board direction.

D. Timing:

1. Task Nos. 1 through 3 will be performed between April 1978 and April 1979.

2. Task No. 4 will be performed from date of contract approval for twelve (12) months (approximately May 1978 - May 1979). Final report due approximately July 1979.

Phase II, April 1979 - June 1980

I. Virus Study

A. Purpose: To determine the significance of possible viral contamination of San Francisco Bay shellfish as a factor preventing their direct use and to determine the usefulness and constraints of coliform as an indicator of virus levels.

B. Tasks:

1. Identify the number and types of virus present in shellfish, water, and sediments from the shellfish study area, an area of suspected viral contamination, and from an approved growing area outside the bay (possibly Drakes Bay or Tomales Bay).

2. Relate the presence or absence of viral and bacteriological contamination to water quality of the study areas and to possible sources of contamination.

   a. Frequency of microbiological sampling will depend on viral depuration rates derived from Phase I.

   b. Surveys representative of a dry weather period, a period of high local runoff, and a period of high delta outflow impacting the bay study areas should be conducted when possible.

3. Determine the value and short-comings of using coliform as an indicator of virus levels.

C. Management: The study will be contracted out under Regional Board direction.

D. Timing: Date of contract approval for twelve (12) months (approximately Arpil 1979 - April 1980). Final report due approximately June 1980.

II. Intensive sanitary survey of shellfish study area and its applications

A. Purpose: To determine under what conditions the study area shellfish are or are not safe to eat, to determine what monitoring program is needed to provide continued assurance of the safety of the shellfish from the study area, to develop the methodology for opening additional beds and to develop costs for ongoing program for budget purposes.

B. Tasks:

1. Monitor coliform, turbidity, conductivity, and suspended solids from the water overlying the shellfish study area and coliform levels from nonpoint sources weekly, except from June through September. During this period samples will be taken daily during one week of each month and twice during other weeks

2. Sample shellfish meat coliform weekly from June through September.

3. Sample shellfish for selected trace metals and selected chlorinated hydrocarbons during the summer.

4. Submit the results of the summer 1979 data (including virus studies) by January 1980 for review and evaluation by State Department of Health and by the local county health department.

5. Determination by State and local health departments whether to open the study shellfish area during the summer of 1980.

6. Determine methods and costs of additional controls on point and nonpoint sources which may be necessary to allow summer opening of shellfish study area or to allow year-round harvesting.

7. Develop a monitoring program and administrative procedures for assuring the safety of the shellfish study area should it be opened for harvesting.

   a. Determine closed areas around outfalls which may affect study shellfish area.

   b. Define boundaries of the open bed and how it will be posted in the field.

   c. Determine what frequency and types of additional inspections and monitoring of municipal treatment plants will be needed.

   d. Provide contingency plan as needed for determining under what conditions and how area may be closed.

   e. Develop emergency response plans to be carried out by appropriate dischargers during the discharge of untreated or inadequately treated (define) wastewater. Incorporate plans into NPDES permits.

   f. Determine kinds, frequency snd costs of monitoring required of an open bed.

8. Develop ongoing program and costs for recreational shellfish harvesting program.

C. Management:

1. Task Nos. 1 through 3 and No. 8 will be contracted out under Regional Board direction.

2. Task Nos. 4, 5, and 7 will be performed by the Regional Board staff with input from local and State Health Departments.

3. Task No. 6 will be performed by the Regional Board staff and/or ABAG as appropriate under the continuing water quality management planning program.

D. Timing:

1. Task Nos. 1 through 3 and No. 8: Date of contract approval for twelve (12) months (approximately Arpil 1979-April 1980). Final report due approximately June 1980.

2. Task No. 4 will be performed as noted in the task description.

3. Task Nos. 5, 6 and 7 will be completed by April 1980.

III. Update of shellfish bed sizes, locations, and access

A. Purpose: To re-evaluate the shellfish resource to better determine the priority of opening other shellfish beds.

B. Tasks:

1. Evaluate shellfish bed information which has been gathered since the comprehensive Department of Fish and Game 1967 study.

2. Conduct field investigations of significant shellfish areas which lack recent information.

C. Management: The update will be performed in house by Regional Board staff.

D. Timing: January - June 1980

Phase III, FYs 1980-81, 1981-82, and 1982-83

A. Purpose: To apply what has been learned and developed during Phases I and II to open the shellfish study area, to conduct sanitary surveys of other shellfish beds, and to open these other shellfish beds.

B. Tasks:

1. Implement Task No. 7 of Phase II (under II).

2. Conduct sanitary surveys of approximately one third of the significant shellfish areas per year using priority list established during Phase II.

3. Submit sanitary survey information to state and local health departments for determination on opening additional beds and provide for additional monitoring as required.

4. After F.Y. 1981-82 begin routine updating of previous sanitary surveys.

C. Management:

1. The Regional Board staff with the assistance of the local county health departments will implement Task Nos. 1, 3, and 4.

2. Part of Task No. 2 will be contracted out under Regional Board staff direction and part performed in house.

D. Timing:

1. Task No. 1, July - September 1980, June - September 1981, June - September 1982, etc (unless beds can be safely opened for longer seasonal periods).

2. Task No. 2, by contract July 1980 - June 1981 with final report due July 1981. Repeat the sequence for fiscal years 1981-82 and 1982-83.

3. Task No. 3 for beds surveyed July 1980 - June 1981, open in July 1981. Repeat the sequence for fiscal years 1981-82 and 1982-83.

4. Task No. 4 will start during fiscal year 1982-83.

SHELLFISH AREA PRIORITY LIST

I think we should study and open beds using an area type approach. Beds that are close together will be studied as units for performing sanitary surveys. Also areas form larger natural groupings which can be more effectively studied together. On this basis I propose that we study the Burlingame bed No. 9 and the contiguous Coyote Pt. north bed No. 10 during Phases I and II. If this area is opened we should study south bay beds in 1980-81, central bay beds in 1981-82, and north bay beds in 1982-83.

Fred E. Jarvis

FRED E. JARVIS
Environmental Specialist II

Griffith L. Johnston

Approved By:
GRIFFITH L. JOHNSTON
Chief of Planning Division

REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

INTERNAL MEMO

File No. 1460.00

TO: Fred H. Dierker
Executive Officer

FROM: Fred Jarvis

DATE: March 2, 1978

SIGNATURE: Fred Jarvis

SUBJECT: Staff Report on the Regional Board Program to Open Shellfish Beds for Recreational Use

San Francisco Bay at one time supplied most of California's shellfish used in commercial trade. Cultured oysters supplied between 2 and 15 million pounds annually and softshell clams were harvested in abundance (Skinner 1962). Pollution started a decline in the oyster fishery beginning around 1915, and progressively worse pollution resulted in closure of the shellfish beds during the 1930's. Subsequently, no commercial shellfish operations have been permited in the bay.

The two most abundant edible clams in the bay are the Japanese or Manila littleneck clam and the eastern softshell clam. Both species were introduced to the bay and thrive wherever they find the substrate and salinity suitable. There are at least 30 million adult clams of these two species in approximately 40 shellfish beds located along the intertidal areas of the bay (Wooster 1968 and ABAG 1977). The clams are not, however, distributed uniformly around the bay. Two shellfish beds, one in Foster City and the other near Albany Hill, account for over 20 million of these clams. The abundance of clams in offshore areas has not been determined.

Board Actions to Protect Shellfish

Shellfishing is a beneficial use identified in the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). The Regional Board also adopted Resolution 74-14 on October 15, 1974, entitled "Policy Statement with Respect to the Implementation of Time Schedules for Facilities to Protect Shellfish." This policy was needed to provide guidance for Clean Water Grant projects to assure that new wastewater treatment facilities would protect shellfish beds. Pursuant to the policy approximately $3,750,000 has been committed for wastewater treatment needed specifically to protect shellfish.

Resolution 74-14 also specified that the Executive Officer: "Evaluate those discharges to waters in the vicinity of shellfish beds to determine if the discharger is or will be providing adequate protection to allow for sport harvesting of shellfish" and to "begin a program to identify and control nonpoint sources to allow for year-round shellfish harvesting." The program which will be discussed later is responsive to these directives.

Shellfish Contaminants

Shellfish feed by filtering plankton and detritus from the overlying water. This mode of feeding results in the accumulation of contaminants within the shellfish to levels greatly exceeding those found in the overlying water. The contaminants of most concern to public health are bacteria and viruses from municipal treatment plants, from small boats and ocean-going vessels, and from urban runoff. Hepatitis is a viral disease known to be transmitted by eating contaminated shellfish. Typhoid fever and gastroenteritis are two bacterial diseases associated with contaminated shellfish. Coliform standards exist for bacterial contamination, but there are no standards for viral contamination. Usually coliform levels are considered indicative of virus levels. The State Health Department questions the reliability of using coliform as an indicator of viral contamination in an area with the diverse and sizeable inputs of wastewater found in San Francisco Bay. On this basis a research study is needed to determine if there are any viruses in bay shellfish, how well do coliform predict the presence of viruses, and what is the public health significance of viruses if any are found.

Trace organic compounds and trace metals are other possible contaminants of concern. These substances reach the bay through municipal and industrial discharges, urban runoff, and to some extent from aerial fallout and washout. The amount of DDT and its metabolites and of PCBs (polychlorinated biphenyls) in bay shellfish were low based on surveys conducted several years ago (Girvin 1975 and EPA 1974). Many other trace organic compounds have not been analyzed for in bay shellfish. A research program is needed to determine the concentrations of easily identified trace organic compounds and order of magnitude concentrations of unidentified trace organics. Trace organics are of concern because of the possible carcinogenicity of some of these substances. At the very low concentrations likely to be found in bay shellfish, however, the public health significance of trace organics found will be difficult to assess.

Trace metals in bay shellfish have been found to be elevated in comparison with cleaner bays. Nevertheless, trace metal concentrations do not generally appear to be a public health concern. Trace metal analyses of shellfish should be performed whenever a thorough sanitary survey of a shellfish bed is conducted in order to confirm this generality.

Of concern to the State Health Department is the total sanitary quality of any shellfish area which includes an evaluation of all potential and actual sources of pollution. Shellfish in San Francisco Bay are susceptible to potentially rapid changes in quality due to possible failures in municipal collection, treatment, and discharge systems, spills of chemicals including oil, and due to urban run-off during periods of rainfall.

Any program to open shellfish beds must take into consideration unexpected contingencies and allow for enough margin of protection to effectively respond to them.

Regulations on Open and Closing Shellfish Beds

The regulations regarding commercial harvesting are straightforward. The State Department of Health controls the commercial shellfish operations through a licensing system established in accordance with the National Shellfish Sanitation Program. Licenses (certificates) are only issued to operations that can reliably produce uncontaminated shellfish. State Health inspectors are responsible for continually inspecting the bacteriological quality of the shellfish growing waters and for conducting inspections to insure the sanitary marketing of the shellfish after they have been harvested. When a company requests a certificate to operate, the State Health Department must make a decision.

I am aware of two recent requests for certificates to harvest shellfish grown in the bay. One company was refused a certificate to establish a shellfish operation in the Berkeley area. Westbay Community Associates has requested a certificate to harvest clams near Foster City for relaying in Tomales Bay. Their plan proposes that after 30 days in the Tomales Bay, the clams will depurate contaminants and be marketed.

The regulations and control of recreational harvesting are confusing as currently being implemented in San Francisco Bay. Shellfish beds may be quarantined under various provisions of the Fish and Game Code and Health and Safety Code by the State Department of Health. Violation of a quarantine is a misdemeanor and is enforceable by the police. Currently no shellfish areas are quarantined in San Francisco Bay, but the State Health Department does not sanction recreational harvesting. Some local health departments have posted beds as being unsafe. These notices are considered as warnings and are not enforced to prevent recreational harvesting. In effect the shellfish beds are not closed to recreational harvesting to the extent that there is no quarantine. On the other hand, the shellfish beds are not really open either because the public health agencies do not approve or encourage harvesting. In addition there is nothing which requires the State Health Department to undertake any research, sanitary survey or action to consider changing the current status of recreational shellfish beds.

Other concerns with Opening Shellfish Beds

There are other problems with opening shellfish beds for recreational use unrelated to water quality. Much of the nearshore of the bay is privately owned. To what extent this ownership denies the public the right to harvest shellfish is unclear. In some cases the privately owned bay lands may still be subject to the public rights of commerce, navigation, and fishing (BCDC 1968). My understanding is that the right to fish includes shellfishing.

Another area of concern that must be resolved before shellfish beds are opened for use are the resource and people management problems. What public areas of the bay should be used for recreational harvesting and what areas for commercial harvesting? How will these uses be compatible with other uses, such as bird watching, swimming, biological reserves, etc.? Will shellfishing be consistent with the wishes of the local residents and the city or county general plans? Where will the people park? Will there be crowds and how will they be controlled? Other than BCDC's policy to increase access to the bay and the shellfish beds as stated in their Bay Plan, I do not know of any planning that is directed to actually permit recreational harvesting.

The Department of Fish and Game appears to be the best agency to prepare the needed management plan to address these concerns.

The Regional Board staff proposes to establish a "Program to Open San Francisco Bay Shellfish Beds for Direct Recreational Use." The program attempts to fill the information needs discussed previously in the section on shellfish contaminants. A copy of the program was distributed to a number of agencies for comment. To date only the Department of Fish and Game has responded. The details of the program may be changed, but the basic concepts which require policy level approval include the following:

(1) The program directs the Regional Board to take the initiative in trying to open shellfish beds for recreational use.

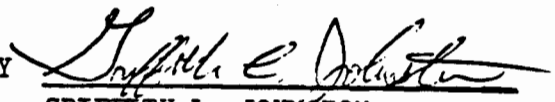
(2) A shellfish area located in San Mateo County will be studied intensively and if the Director of the State Department of Health raises no objections to its opening, the Regional Board staff will work with the local county health department and Department of Fish and Game to open all or a part of the study area for direct recreational harvesting.

(3) Based on what is learned from the shellfish study area, a program to identify the costs and methods of opening additional shellfish areas will be developed.

(4) The program will require an ongoing commitment of Regional Board staff and State funds to conduct sanitary surveys, to perform other in house and contract studies, and if beds are opened to perform additional inspections of some sewage treatment plants and other monitoring as needed.

Other than the issue of the wholesomeness of bay shellfish, a resource management plan by the Department of Fish and Game is necessary to insure the enjoyable, orderly use of shellfish beds by the public and to protect the resource from possible over-use. Such a plan will be most effective if it is developed in concert with the Regional Board shellfish program.

I also believe that the Department of Fish and Game should be encouraged to conduct a research program to find ways of enhancing the shellfish resource by improving substrate conditions or by modifying other factors amenable to control. In the future it may be more feasible and cost effective to enhance or to create new shellfish beds in suitable public land areas of San Francisco Bay located away from sources of pollution than to further upgrade treatment processes or to purchase privately owned beds.

APPROVED BY 

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