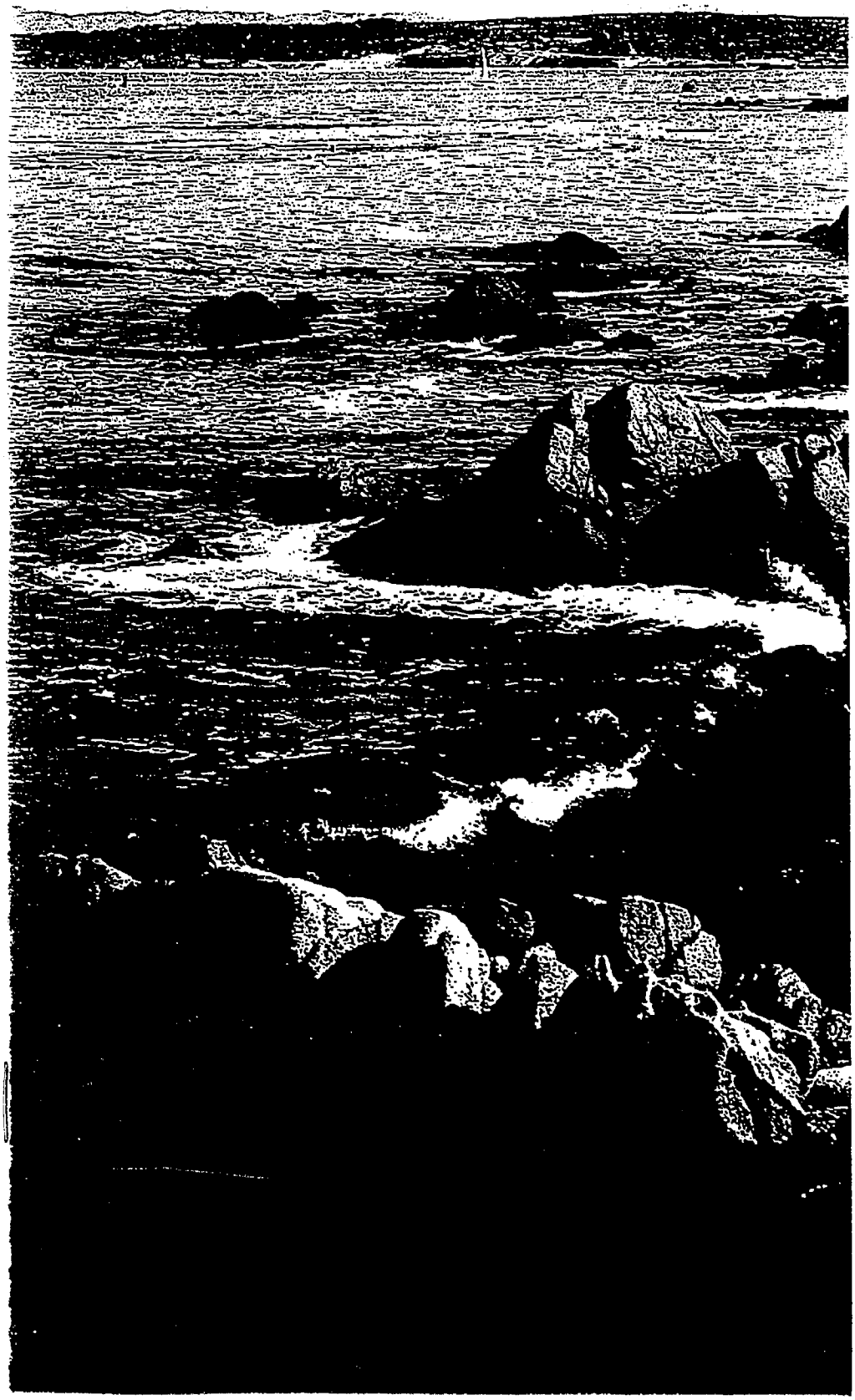

# BAY PROTECTION AND TOXIC CLEANUP PROGRAM

## List of Reports Completed and in Preparation

May 1999

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER QUALITY

STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER QUALITY

# BAY PROTECTION AND TOXIC CLEANUP PROGRAM

# LIST OF REPORTS COMPLETED AND IN PREPARATION

May 1999

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# BAY PROTECTION AND TOXIC CLEANUP PROGRAM
# LIST OF REPORTS COMPLETED AND IN PREPARATION

This document lists the Bay Protection and Toxic Cleanup Program (BPTCP) reports that have been completed or are in preparation. A list of the data collected through the BPTCP monitoring activities is presented in the appendix.

The BPTCP started the task of identifying toxic hot spots and planning for their cleanup in 1990. The reports listed include many of the documents developed while the program was just getting underway as well as reports on all of the monitoring data collected to date. The BPTCP has also completed many reports on tasks leading up to development of regional and consolidated toxic hot spot cleanup plans.

To date, the BPTCP has produced 55 scientific reports, currently under completion or finalized and 43 staff reports.

The Bracketed bold numbers at the end of each reference **[No.]** are BPTCP report index numbers. Any of the indexed reports are available for inspection. Reports that are not numbered are currently unavailable because they are in preparation, or out of print. Some reports are large and may require special printing arrangements to be made in order to make them available. Please make reference to the index number when ordering a specific report. To request a report please contact:

Bays and Estuaries Unit
Division of Water Quality
State Water Resources Control Board
901 P Street
Sacramento, CA 95814
(916) 657-0671

## SCIENTIFIC REPORTS

Anderson, B. S., J.W. Hunt, M. Hester, and B. M. Phillips, 1996. Assessment of Sediment Toxicity at the Sediment-Water Interface. Techniques in Aquatic Toxicology. Chapter 33, pp 609-624. CRC Press, Inc. **[73]**

Anderson, B., J. Hunt, B. Phillips, J. Newman, R. Tjeerdema, C. J. Wilson, G. Kapahi, R. A. Sapudar, M. Stephenson, M. Puckett, R. Fairey, J. Oakden, M. Lyons, and S. Birosik. 1998. Sediment Chemistry, Toxicity and Benthic Community Conditions in Selected Water Bodies of the Los Angeles Region. 232pp, 7 appendices. **[93]**

Anderson, B. S., Hunt, J.W., Phillips, B.M., Tudor, S., Fairey, R., Newman, J., Puckett, H.M., Stephenson, M., Long, E.R. and Tjeerdema, R.S. 1998. Comparison of marine sediment toxicity test protocols for the amphipod *Rhepoxynius abronius* and the polychaete worm *Nereis (Neanthes) arenaceodentata*. Envir. Toxicol. Chem, Vol 17, No.5, pp 859-866. **[50]**

Anderson, B.S., J.W. Hunt, S. Tudor, J. Newman, R. Tjeerdema, R. Fairey, J. Oakden, C. Bretz, C.J. Wilson, F. LaCaro, M. Stephenson, M. Puckett, J. Anderson, E.R. Long, T. Fleming, and K. Summers. 1997. Chemistry, Toxicity, and Benthic Community Conditions in Sediments of Selected Southern California Bays and Estuaries. 146 pp. + 3 Appendices. **[8F]**

Anderson, J.W., K. Bothner, J. Means, D. McMillin, T. Vu, and R. Tukey. 1995. Correlation of CYP 1A1 Induction, as Measured by the P450 RGS Biomarker Assay, with Benzo(a)pyrene Equivalents (BaPTEQs) in Extracts of Mussels Deployed at Various Sites in San Diego Bay. 10pp. + Appendix. **[12A1]**

Anderson, J.W., S.S. Rossi, R.H. Tukey, T. Vu, and L.C. Quattrochi. 1995. A biomarker, P450 RGS, for assessing the potential toxicity of organic compounds in environmental samples. Environmental Toxicology and Chemistry. 14(7):1159-1169. **[12B]**

Bretz, C., J. Oliver, J. Oakden, and P. Slattery. 1993. Bay Protection and Toxic Cleanup Program Los Angeles Harbor Benthic Sampling (August - September 1992). Moss Landing Marine Laboratories. 32pp. + 4 Appendices. **[1D]**

Buchanan, P.A., D.H. Schoellhamer, and R.C. Sheipline. 1996. Summary of Suspended-Solids Concentration Data, San Francisco Bay, California, Water Year 1994. San Francisco Regional Water Quality Control Board, U.S. Army Corps of Engineers, Interagency Ecological Services. U.S. Geological Survey Open File Report 95-776. 48pp. **[15]**

Chapman, P. M., Anderson, B., Carr, S., Engle, V.,Green, M. R., Hameedi, J., Harmon, M., Haverland, P., Hayland, J., Ingersoll, C., Long, E., Rogers Jr., J., Salazar, M., Sibley, P. K., Smith, P.J., Swartz, R. C., Thompson, B. and Windom, H. 1997. General Guidance for Using the Sediment Quality Triad. Marine Pollution Bulletin, Vol 34, No. 6, pp 368-372. **[74]**

Clark, S. L., J. Bruns, V. Connors, J. Cooke, B. Croyle, C. Foe, M. McGraw, S. Morford, and Sue Yee. 1998. Metal Concentrations, Loads, and Toxicity Assessment in the Sacramento/San Joaquin Delta: 1993-1995. 215pp, 4 Appendices. **[89]**

Crepeau, K., K. Kuivila, C. Foe, V. Connor, and H. Bailey. 1995. Algal Toxicity Identification Evaluation - TIEs. CVRWQCB and U.S. Geological Survey. 11pp. **[13J]**

Deanovic, L.E., H. Bailey, T.W. Shed, and D.E. Hinton. 1996. Sacramento-San Joaquin Delta Estuary Bioassay Monitoring Report, 1993-94. First Annual Report to the Central Valley Regional Water Quality Control Board. 69 pp. + 5 Appendices. **[13E]**

Deanovic, L.E., H. Bailey, T.W. Shed, and D.E. Hinton. In review. 1994-95 Sacramento-San Joaquin Delta Estuary Bioassay Monitoring Study, Annual Report. University of California Davis Report.

Deanovic, L., K. Cortright, K. Larsen, E. Reyes, H. Barley, and D. E. Hinton. 1998. Sacramento-San Joaquin Delta Estuary Bioassey Monitoring report 1994-1995. Second Annual Report to the Central Valley Regional Water Quality Control Board. 92pp, 15 Appendices. **[87]**

Downing J., R. Fairey, C. Roberts, E. Landrau, R. Clark, J. Hunt, B. Anderson, B. Philips, C. J. Wilson, F. LaCaro, G. Kapahi, K. Worcester, M. Stephenson, M. Puckett. 1998. Chemical and Biological Measures of Sediment Quality in the Central Coast Region. 84pp, 6 Appendices. **[92]**

Fairey, R., C. Bretz, S. Lamerdin, J. Hunt, B. Anderson, S. Tudor, C.J. Wilson, F. LaCaro, M. Stephenson, M. Puckett, and E.R. Long. 1996. Chemistry, toxicity, and benthic conditions in the San Diego Bay region. 162 pp. + 5 Appendices. **[5B]**

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Fairey, R., Roberts, C., Jacobi, M., Lamerdin, S., Clark, R., Downing, J., Long, E., Hunt, J., Anderson, B., Newman, J., Tjeerdema, R., Stephenson, M., Wilson, C. 1998. Assessment of Sediment Toxicity and Chemistry in the San Diego Bay Region. Environ. Toxic. Chem, Vol 17, No. 8, pp 1570-1581. **[51]**

Fairey, R., Taberski, K., Lamerdin, S., Johnson E., Clark, R. P., R., Downing, J.W., Newman, J., Petreas, M. 1997. Organochlorines and other environmental contaminants in muscle tissue of sportfish collected from San Francisco Bay. Mar. Poll. Bull, Vol34, No. 12, pp 1072-1077. **[52]**

Flegal, A.R., R.W. Risebrough, B. Anderson, J. Hunt, S. Anderson, J. Oliver, M. Stephenson, and R. Packard. 1994. San Francisco Estuary Pilot Regional Monitoring Program: Sediment Studies. **[41]**

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Foe, C.G. In preparation. Transport of suspended sediment and metals into the Sacramento-San Joaquin Delta Estuary during 1995. Staff Report. Central Valley Regional Water Quality Control Board. Sacramento, CA.

Foe, C. G. and B. Croyle. 1998. Mercury Concentration and Loads from the Sacramento River and from Cache Creek to the Sacramento - San Joaquin Delta Estuary. 81pp, 2 Appendices. **[88]**

Foe, C., L. Deanovic., and D. Hinton. 1998. Toxicity Identification Evaluations of Orchard Dormant Spray Storm Runoff. 41pp. 2 Appendices. **[90]**

Gross, E.S., J.R. Koseff, and S.G. Monismith. 1996. A Study of Transport in a Shallow Estuary. Stanford University. 25 pp. + Appendix. **[17]**

Hendricks, T., and R. Eganhouse. 1992. Modification and Verification of Sediment Deposition Models. Southern California Coastal Waters Research project. 330pp **[72]**

Hansen and Associates. 1996. Development of Guidelines for Conducting Toxicity Identification Evaluation on Estuary Sediments in San Francisco Bay. **[6C]**

Hunt, J.W., B.S. Anderson, B.M. Phillips, J. Newman, R. Tjeerdema M. Stephenson, M. Puckett, R. Fairey, R.W. Smith, and K. Taberski. 1998. Evaluation and Use of Sediment Reference Sites and Toxicity Tests in San Francisco Bay. 132 pp. + 4 Appendices. **[6B]**

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Jacobi, M., R. Fairey, C. Roberts, E. Landrau, J. Hunt, B. Anderson, B. Phillips, C. J. Wilson, G. Kapahi, F. LaCaro, B. Gwynne, M. Stephenson, M. Puckett. 1998. Chemical and Biological Measures of Sediment Quality and Tissue Bioaccumulation in the North Coast Region. 79pp, 6 Appendices. **[91]**

Kimball, T., L. Deanovic, D. Hinton. 1997. Rainbow Trout Toxicity Testing Results of the Sacramento River and Tributaries. Semi-Annual Report. December 1996- August 1997. Data Appendix. Aquatic Toxicology Lab UCD. **[98]**

Kuivila, K. M. and K. L. Crepeau. 1999. Laboratory Study of the Response of Select Insecticides to Toxicity Identification Evaluation Procedures. USGS Water- Resources Investigations Report 99-4004. 8pp **[96]**

Larsen, K., L. Deanovic, H. Bailey. August 1996- July 1997. Sacramento River Watershed Program Toxicity Testing Results. Quarterly Reports. 5 Volumes. **[97]**

Luoma, S.N., A. van Geen, B.G. Lee, J. Cloern, and D. Schoellhamer. 1996. Effect of Resuspension and Phytoplankton Primary Production on Metal Cycling in South San Francisco Bay. Draft Report. U.S. Geological Survey. 33pp. **[16]**

Long, E.R., and C.J.Wilson. 1997 On the Identification of Toxic Hot Spots using Measures of the Sediment Quality Triad. Marine Pollution Bulletin, Vol. 34, No. 6, pp. 373-374. **[71]**

Newman, J.W. 1998. Expanded Characterization of Polyaromatic Hydrocarbons in Castro Cove Surficial Sediments. 30pp. **[106]**

Okihiro, M.S. and D.E. Hinton. 1996. A comparative evaluation of biomarker methods using fish captured from the Los Angeles Harbor area. Department of Anatomy Physiology and Cell Biology, University of California, Davis. 165 pp. **[1E]**

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Riege, L.E., and R. W. Smith. 1996. DOD Sediment Criteria Project Ambient Analysis Interim Report: Final. EcoAnalysis, Inc. 18pp. + Appendix. **[14]**

Sanders, B. 1994. Biomarker Evaluations of Biological Effects in *Mytilus* Exposed to Multiple Stressors in San Diego Bay. Molecular Ecology Institute. California State University, Long Beach, CA. 6pp. + 5 Appendices. **[12C]**

Sanders, B. 1995. Biomarker Evaluations of Biological Effects in *Mytilus* Exposed to Multiple Stressors in San Diego Bay. Phase 1, Task 1. Evaluation of Biomarkers of Exposure in Deployed Mussels Exposed to Contaminants *in situ*. Molecular Ecology Institute, California State University, Long Beach. 6pp. + Appendix. **[12D]**

Sanders, B. 1995. Biomarker Evaluations of Biological Effects in *Mytilus* Exposed to Multiple Stressors in San Diego Bay. Phase 1, Task 3. Chemical Analysis of Juveniles. Molecular Ecology Institute, California State University, Long Beach. 15pp. + Appendix. **[12E]**

Sanders, B. 1995. Biomarker Evaluations of Biological Effects in *Mytilus* Exposed to Multiple Stressors in San Diego Bay. Phase II, Task 1. Field Report Molecular Ecology Institute, California State University, Long Beach. **[12F]**

Sanders, B. 1996. Biomarker Evaluations of Biological Effects in *Mytilus* Exposed to Multiple Stressors in San Diego Bay. Data and Statistical Summaries. Molecular Ecology Institute, California State University, Long Beach. **[12G]**

Sanders, B. 1996. Biomarker Evaluations of Biological Effects in *Mytilus* Exposed to Multiple Stressors in San Diego Bay. Phase II. Progress Reports. Molecular Ecology Institute, California State University, Long Beach. **[12H]**

Sanders, Brenda, M. Salazar, and S. Steinert. Draft. Cellular Biomarker of Environmental-Induced Damage and growth in *Mytilus* Deployed in San Diego Bay. **[12J]**

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Slotten, D.G., S.M. Ayers, J.E.Reuter, C.R.Goldman. 1997. Cache Creek Watershed Preliminary Mercury Assessment, Using Benthic Macro-Invertebrates. Division of Environmental Studies, University of California, Davis 36pp. **[13K]**

Smith, R.W. 1994. Identification of Toxic Sediments in San Diego Bay. EcoAnalysis, Inc. 26pp. **[45]**

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Stephenson, M. 1992. A report on bioaccumulation of trace metals and organics in bivalves in San Francisco Bay. California Department of Fish and Game. **[43]**

Stephenson, M., M. Puckett, N. Morgan, and M. Reid. 1994. Bay Protection and Toxic Cleanup Program Quality Assurance Project Plan. 12 Sections and 1 appendix. **[18]**

Taberski, K.M., M. Carlin, and J. Lacy. 1992. San Francisco Bay Pilot Regional Monitoring Program 1991-1992 Summary Progress Report. San Francisco Bay Regional Water Quality Control Board. **[40]**

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San Francisco Bay Regional Monitoring Program for Toxic Contaminants in the San Francisco Estuary. 32 pp. **[46]**

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Brodberg, R.K., K. Kan, and G.A. Pollock. 1993. Strategy for establishing sediment quality objectives based on human health risk assessment. Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. Sacramento, CA. 33 pp. **[31]**

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DWQ/SWRCB. 1991a. Staff Report: Bay Protection and Toxic Cleanup Program Annual Fees Responses to Comments Received. Sacramento, CA. **[33C]**

DWQ/SWRCB. 1991b. Staff Report: Laboratory services interagency agreement to support the Bay Protection and Toxic Cleanup Program. Sacramento, CA. 12 pp. + 1 attachment. **[34]**

DWQ/SWRCB. 1992. Staff Report: Technical Services Interagency Agreement with Teale Data Center to support the Bay Protection and Toxic Cleanup Program Consolidated Database. Sacramento, CA. **[35]**

DWQ/SWRCB. 1993. Draft Staff Report: Criteria to rank toxic hot spots in enclosed bays and estuaries of California. Sacramento, CA. 27 pp. + 3 Appendices. **[39]**

DWQ/SWRCB. 1994. Staff Report: Interagency agreement with the Department of Fish and Game to support the monitoring and research activities of the Bay Protection and Toxic Cleanup Program. Sacramento, CA. 18 pp. **[37]**

DWQ/SWRCB. 1995a. Draft Functional Equivalent Document: Development of the Water Quality Control Policy for Implementation of the Bay Protection and Toxic Cleanup Program. Sacramento, CA. 358 pp. **[21]**

DWQ/SWRCB. 1995b. Draft Staff Report: Status of the Bay Protection and Toxic Cleanup Program. 29pp. + Appendices. **[26]**

DWQ/SWRCB. 1995c. Workshop on the Future Direction of the Bay Protection and Toxic Cleanup Program. List of Workshop Presenters and Written Comments. Sacramento, CA. 109 pp. **[22]**

DWQ/SWRCB and the Teale Data Center. 1992. Feasibility study for establishing the Water Resources Control Board's Bay Protection and Toxic Cleanup Program Data Management System. Sacramento, CA. **[36]**

DWQ/SWRCB. 1998. Draft Functional Equivalent Document. Water Quality Control Policy for Guidance on the Development of Regional Toxic Hot Spot Cleanup plans. Plus - Notice of Public Hearing on the proposed Water Quality Control Policy. **[70]**

DWQ/SWRCB. 1998. Final Functional Equivalent Document. Water Quality Control Policy for Guidance on the Development of Regional Toxic Hot Spot Cleanup plans. Plus - SWRCB Resolution No. 98-090 and Water Quality Control Policy. **[83]**

Kolb, L.P. 1995. Review of the Bay Protection and Toxic Cleanup Program. A Report to the State Water Resources Control Board. San Francisco Bay Regional Water Quality Control Board. 11 pp. **[24]**

Lorenzato, S.G., A. Gunther, and J.M. O'Connor. 1991. Summary of a workshop concerning sediment quality assessment and development of sediment quality objectives. Aquatic Habitat Institute. Richmond, CA. **[30]**

Lorenzato, S.G. and C.J. Wilson. 1991. Workplan for the development of sediment quality objectives for enclosed bays and estuaries of California. SWRCB Report No. 91-14WQ. **[29]**

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Scientific Planning and Review Committee. 1997. Recommendations on the Bay Protection and Toxic Cleanup Program Monitoring Activities. 23 pp. + 2 Appendices. **[48C]**

Smith, R.E. and R.T. Cheng. 1994. Defining intertidal bathymetry of the southern extreme of South San Francisco Bay. U.S. Geological Survey, Menlo Park, CA. **[42]**

SWRCB. 1991a. Final Statement of Reasons Title 23, Division 3, Chapter 9, Article 6, Section 2236, California Code of Regulations: Bay Protection and Toxic Cleanup Annual Fees. **[33A]**

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SWRCB. 1991c. Regulations to Implement the Bay Protection and Toxic Cleanup Program Annual Fees. Title 23, California Code of Regulations Section 2236. SWRCB Resolution No. 91-102. **[33B]**

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SWRCB. 1993. Staff Report: Status of the Bay Protection and Toxic Cleanup Program. Sacramento, CA. 230 pp. + 6 appendices. **[25]**

SWRCB. 1995a. Appointment of the Advisory Committee for the Bay Protection and Toxic Cleanup Program. SWRCB Resolution No. 95-15. **[38A]**

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SWRCB. Water Quality Control Policy for Guidance on Development of Regional Toxic Hot Spot Cleanup plans. Plus SWRCB Resolution No. 98-090. **[84]**

SWRCB and U.S. EPA Environmental Monitoring and Assessment Program. 1994. Measures of Bioeffects Associated with Toxicants in Small Bays and Estuaries of Southern California (Pilot Study). Proposal for a Cooperative Agreement. 27 pp. + 3 Appendices. **[8B]**

SWRCB and NOAA. 1991. NOAA/California Proposal for a Cooperative Agreement: Measures of Bioeffects Associated with Toxicants in Southern California. State Water Resources Control Board and National Oceanic and Atmospheric Administration. State Water Resources Control Board. Division of Water Quality. Sacramento, CA. **[8A1]**

SWRCB and NOAA. 1992. Measures of Bioeffects Associated with Toxicants in Southern California: Year Two Proposal to Continue a Cooperative Agreement. State Water Resources Control Board and National Oceanic and Atmospheric Administration. State Water Resources Control Board. Division of Water Quality. Sacramento, CA. **[8A2]**

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SWRCB, RWQCBs, and DFG. 1995. Scientific Planning and Review Committee Briefing Document for the Bay Protection and Toxic Cleanup Program. Sacramento, CA. 89 pp. **[48A]**

SWRCB, RWQCBs, and DFG. 1996. Scientific Planning and Review Committee Briefing Document for Recommendations on the Bay Protection and Toxic Cleanup Program Monitoring Activities. Sacramento, CA. 75 pp. **[48B]**

Tappel, M.E., C.J. Wilson, R. Packard, J. Luedtke, G. Huener, and G. Strand. 1994a. Personal computer BPTCP data system users guide and BPTCP email program (Pine) users Guide. Draft Report. Division of Water Quality, State Water Resources Control Board. Sacramento, CA. **[28A]**

Tappel, M.E., C.J. Wilson, R. Packard, J. Luedtke, G. Huener, and G. Strand. 1994b. Workstation BPTCP data system users guide and BPTCP email program (Pine) users Guide. Draft Report. Division of Water Quality, State Water Resources Control Board. Sacramento, CA. **[28B]**

UCD. Aquatic Toxicity laboratory, School of Veterinary Medicine. Progress Report. March 4, 1998, June 30, 1998, October 20, 1998, January 4, 1999. Agricultural Management Practices Contract. **[102]**

Zalom, F.G., M.N.Oliver, D.E. Hinton. Draft. Teaching/ Outreach Documents. Dormant Treatment Options for Orchards in General. 4pp, Dormant Treatment Options for Almond Growers. 5pp, Dormant Treatment Options for Fruit Growers. 5pp. Statewide IPM Project, Centers for Water and Wildlands Resources, and Eco Toxicology Program, UCD. **[101]**

Draft Teaching/Outreach Documents: Organophosphates and Water Quality: More than just a problem of perception, Dormant Treatment Options, Best Management Practices for Organophosphate Dormant Sprays. **[103]**

Zalom, F.G., and D.E. Hinton. Draft Final Report. Alternatives to Chlorpyrifos and Diazinon Dormant Sprays. Statewide IPM Project, and Eco Toxicology Program, UCD. 6pp. **[104]**

## TOXIC HOT SPOT CLEANUP PLAN DEVELOPMENT

RWQCB. December, 1997. Proposed Regional Toxic Hot Spot Cleanup Plans. North Coast Region. **[67]**

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RWQCB. December, 1997. Proposed Regional Toxic Hot Spot Cleanup Plans. Los Angeles Region. **[67]**

RWQCB. December, 1997. Proposed Regional Toxic Hot Spot Cleanup Plans. Central Valley Region. **[67]**

RWQCB. December, 1997. Proposed Regional Toxic Hot Spot Cleanup Plans. Santa Ana Region. **[67]**

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SWRCB. October, 1997. Guidance On Development of Proposed Regional Toxic Hot Spot Cleanup Plans. **[66]**

SWRCB. 1999. Draft Functional Equivalent Document. Consolidated Toxic Hot Spots Cleanup Plan. Plus Appendix A. Policy, Toxic Hot Spot List and Findings, and Appendix B, Volume II Regional Cleanup Plans. 339pp, plus Appendix A, and Appendix B. **[95]**

# LIST OF DATA COLLECTED
# AS
# PART OF THE BPTCP

## LIST OF DATA COLLECTED AS PART OF THE BPTCP

### NOAA Cooperative Assessment Project- Year 1 (Los Angeles Harbor)- Regions 4 & 8
[1A][1B]

**Legs**

1 through 4, plus 3 stations from Leg 5

**Sampling dates and regions**

Leg 1- 7/29/92 through 8/6/92 - Region 4
Leg 2- 8/18/92 through 8/19/92 - Region 4
Leg 3- 9/1/92 through 9/2/92 - Region 4
Leg 4- 9/15/92 through 9/16/92 - Regions 4 & 8
Leg 5- 10/14/92 - Region 8

**Number**

111 stations (37 sites with three replicates »100m apart)

**Chemical analysis**

Organic analysis on 66 stations (Groups 1 & 3)
Metal analysis on 66 stations (Groups 1 & 3)
Pore water metal analysis on 21 stations
TOC & grain size analysis on all 111 stations

**Toxicity testing**

Red abalone larvae development in pore water on all 111 stations
Amphipod survival in solid phase on all 111 stations

**Benthic community**

Analysis on all 111 stations

**Products**

- o Data report for Legs 1-4 & 5 submitted to SWRCB 7/9/93; cruise reports; QA/QC reports for chemistry, toxicity, TOC, grain size, and benthic data

- o Los Angeles Harbor Benthic Program Report - 9/93

## BPTCP Screening - All regions statewide [2A][2B]

**Legs**

5 through 14

**Sampling dates and regions**

Leg 5- 10/13/92 through 10/14/92 - Region 9
Leg 6- 10/23/92 through 10/28/92 - Region 9
Leg 7- 11/8/92 through 11/11/92 - Region 9
Leg 8- 11/27/92 through 11/30/92 - Region 1
Leg 9- 12/8/92 through 12/11/92 - Region 8
Leg 10- 12/18/92 through 12/22/92 - Region 3
Leg 11- 1/12/93 through 1/14/93 - Region 4
Leg 12- 1/26/93 through 1/27/93 - Region 9
Leg 13- 2/9/93 through 2/11/93 - Regions 3 & 4
Leg 14- 2/23/93 through 2/26/93 - Region 1

**Number**

153 stations (no replicates)

**Chemical analysis**

Organic analysis on 72 stations (Groups 2, 4 & 5)
Metal analysis on 72 stations (Groups 2, 3 & 5)
TOC & grain size analysis on all 153 stations

**Toxicity testing**

Amphipod survival in solid phase on all 153 stations
Red abalone larvae development in subsurface water on 105 stations
Red abalone larvae development in pore water on 4 stations
Urchin fertilization in pore water on 121 stations
Urchin larvae development in pore water on 61 stations
Urchin embryo cytogenetics on 35 stations
Mussel larvae development in subsurface water on 39 stations

Mussel larvae development in pore water on 31 samples
Neanthes survival in solid phase on 45 stations
Neanthes weight change in solid phase on 45 stations

**Benthic community**

No analysis

**Products**

Data report for Legs 5-14 submitted to SWRCB 4/20/94; includes all analytical data, cruise reports; QA/QC reports for chemistry, toxicity, TOC, and grain size data

## NOAA Cooperative Assessment- Year 2 (San Diego Bay)- Region 9 & BPTCP Reference Stations [3A][3B]

**Legs**

15 through 19

**Number**

108 total stations (no replicates)
83 stations were NOAA/EMAP random locations
25 stations were BPTCP reference site screening

**Sampling dates and regions**

Leg 15- 3/23/93 through 3/25/93 - Region 9
Leg 16- 4/6/93 through 4/7/93 - Region 9
Leg 17- 4/20/93 through 4/22/93 - Regions 9 & 8
Leg 18- 5/4/93 through 5/6/93 - Regions 9 & 8
Leg 19- 5/26/93 through 5/27/93 - Regions 9, 8 and 4

**Chemical analysis**

Organic analysis on 2 stations (Groups 5)
Organic analysis pending on 15 stations (Group 9)
Metal analysis on 2 stations (Groups 5)
Metal analysis pending on 15 stations (Group 9)
TOC & grain size analysis on all 108 stations

**Toxicity testing**

Amphipod survival in solid phase on all 108 stations
Red abalone larvae development in subsurface water on 8 stations
Urchin fertilization in pore water on all 108 stations
Urchin larvae development in pore water on 16 stations

**Benthic community**

No analysis

**Products**

Data report for Legs 15-23 submitted to SWRCB 4/20/94; includes all analytical data, cruise reports; QA/QC reports for chemistry, toxicity, TOC, and grain size data

**BPTCP Confirmation combined with NOAA Cooperative Assessment- Year 2 - Regions 9 & 4 (San Diego primarily; L.A. Region reference stations) [3A][3B][3C][3E]**

**Legs**

20 through 23

**Sampling dates and regions**

Leg 20- 6/15/93 through 6/17/93 - Region 9 & 4
Leg 21- 7/20/93 through 7/21/93 - Region 9
Leg 22- 8/3/93 through 8/5/93 - Regions 9 & 4
Leg 23- 8/17/93 through 8/19/93 - Regions 9 & 4

**Number**

107 total stations
91 analytical stations, 4 blind duplicates, 12 megamuds
41 stations were NOAA/EMAP random locations
20 stations were BPTCP confirmation (with 2 EMAP/NOAA for group of 3)
30 stations were BPTCP confirmation (10 sites with 3 reps)

**Chemical analysis**

Organic analysis on 94 stations (Group 6)
Metal analysis on 94 stations (Group 6)
TOC & grain size analysis on 95 stations

**Toxicity testing**

Amphipod survival in solid phase on all 107 stations
Red abalone larvae development in subsurface water on 6 stations
Urchin fertilization in pore water on all 107 stations
Urchin larvae development in pore water on 70 stations
Neanthes weight change in solid phase on 40 stations

**Benthic community**

Analysis on 90 stations

**Products**

Data report for Legs 15-23 submitted to SWRCB 4/20/94; includes all analytical data, cruise reports; QA/QC reports for chemistry, toxicity, TOC, grain size, and benthic data

**BPTCP Confirmation- Regions 1, 3, 4, 8 & 9 [5A][5C][5D][5E]**

**Legs**

24 through 30, 32 & 33

**Sampling dates and regions**

Leg 24- 1/18/94 through 1/20/94 - Region 9
Leg 25- 1/31/94 through 2/2/94 - Regions 4 & 8
Leg 26- 2/15/94 through 2/16/94 - Regions 4 & 8
Leg 27- 3/1/94 through 3/2/94 - Region 9
Leg 28- 3/15/94 through 3/16/94 - Region 9
Leg 29- 3/29/94 through 3/31/94 - Regions 9 & 8
Leg 30- 4/12/94 through 4/14/94 - Regions 4 & 8
Leg 32- 5/18/94 through 5/20/94 - Regions 1, 3, 4, 8 & 9
Leg 33- 6/13/94 through 6/16/94 - Regions 1 & 3

**Number**

266 total stations
234 stations were BPTCP confirmation (78 sites with 3 reps »20m apart)
32 stations were reference site screening

**Chemical analysis**

Organic analysis completed on 162 stations (Groups 7 & 8)
Metal analysis completed on 162 stations (Groups 7 & 8)
TOC & grain size analysis completed on all 266 stations
No chemical analysis authorized for legs 30, 32 or 33 (n=90)

**Toxicity testing**

Amphipod survival in solid phase data completed on all stations authorized
Urchin fertilization in pore water data completed on all stations authorized
Urchin larvae development in pore water data completed on all stations authorized
*Neanthes* weight change and survival in solid phase data completed on all stations authorized

**Benthic community**

No analysis authorized

**Products**

Data report for Legs 24-33 submitted to SWRCB 3/22/95; includes all analytical data, cruise reports; QA/QC reports for chemistry, toxicity, TOC, and grain size data

## Reference Site Study- San Francisco Bay [6A][6D][6E]

**Legs**

31, 35 and 37

**Sampling dates and regions**

Leg 31- 4/25/94 through 4/27/94 - Region 2
Leg 35- 9/6/94 through 9/8/94 - Region 2
Leg 37- 3/7/95 through 4/4/95 - Region 2

**Number**

46 stations

**Chemical analysis**

Organic analysis completed on 18 stations (Groups 11 & 15)
Metal analysis completed on 18 stations (Groups 11 & 15)
TOC & grain size analysis completed on all 46 stations

**Toxicity testing**

Amphipod survival in solid phase (*Ampelisca, Eohaustorius*) and pore water (*Eohaustorius)* completed on all 46 stations
Urchin larvae development in pore water completed on all 46 stations
*Neanthes* weight change and survival in solid phase completed on 13 stations
Amphipod survival at sediment/water interface completed on 26 stations
*Nubelia* survival in solid phase completed on 18 stations
Bivalve development in pore water completed on all 46 stations

**Benthic community**

No analysis

**Products**

Data report for Legs 31, 35 & 37 submitted to SWRCB October 1995; includes all analytical data, cruise reports; QA/QC reports for chemistry, toxicity, TOC, and grain size data

Evaluation of sediment toxicity tests and reference sites in San Francisco Bay Draft Report submitted to SWRCB 5/96

Development of toxicity identification evaluation guidelines for estuarine sediment Final Report submitted to SWRCB 6/96

## Fish Tissue Contaminant Study- San Francisco Bay [7B][7C]

**Sampling dates and regions**

5/3/94 through 6/4/94 - Region 2

**Number**

66 composite samples from 13 stations

**Chemical analysis**

Organic analysis on all 66 composite samples
Metal analysis on all 66 composite samples
Dioxin/Furan analysis on 13 composite samples

**Products**

QA/QC evaluative reports for all analytical data

Contaminant levels in fish tissue from San Francisco Bay - Final Report - June, 1995

An assessment of contaminant levels in fish tissue from San Francisco Bay - scientific paper accepted for publication in peer-reviewed journal - 11/96

## EMAP/NOAA/BPTCP Cooperative Pilot Study of Southern California Coastal Lagoons/Estuaries- Regions 8 & 9 [8D][8E]

**Legs**

34 and 36

**Sampling dates and regions**

Leg 34- 8/30/94 through 9/1/94 - Region 9
Leg 36- 9/19/94 through 9/21/94 - Region 8 & 9

**Number**

43 total stations
30 stations were NOAA/EMAP random locations
13 stations were targeted for possible hot spots

**Chemical analysis**

Organic analysis completed on all 43 stations

Metal analysis completed on all 43 stations
TOC & grain size analysis completed on all 43 stations

**Toxicity testing**

Amphipod (*Rhepoxynius*) survival test in solid phase completed on all 43 stations
Amphipod (*Ampelisca*) survival test in solid phase completed on 25 stations
Urchin larvae development in pore water test completed on all 43 stations

**Benthic community**

Benthic samples collected and analyzed from all 43 stations (3 replicates per station)

**Products**

Data report for Legs 34 & 36 submitted to SWRCB November 1995; includes all analytical data, cruise reports; QA/QC reports for chemistry, toxicity, TOC, grain size, and benthic data.

**BPTCP Region 2 Screening: San Francisco Bay [9A][9B][9C]**

**Legs**

38, 39, 40, and 41

**Sampling dates and regions**

Leg 38- 4/17/95 through 4/19/95 - Region 2
Leg 39- 5/1/95 through 5/2/95 - Region 2
Leg 40- 10/25/95 through 10/27/95 - Region 2
Leg 41- 12/5/95 through 12/7/95- Region 2

**Number**

95 grab, 9 core stations for BPTCP screening (no replicates); 3 stations collected for TIE project

**Chemical analysis**

Organic analysis completed on 18 stations authorized; (*)data pending for 2 additional stations (full scan) and 4 additional stations (PCB sediment only)
Metal analysis completed on 18 stations authorized; TBT completed on 6 stations authorized; (*) data pending for 2 additional stations (full scan) and 8 additional stations (mercury in sediment only)
TOC & grain size analysis on all 95 stations

**Toxicity testing**

Amphipod survival in solid phase completed on all 95 stations
Urchin larvae development in pore water completed on all 95 stations

Urchin larvae development in sediment/water interface core completed on all 9 core samples (*)

**Benthic community**

No analysis

**Products**

Data report for Legs 38, 39, 40 and 41 submitted to SWRCB June 1996; includes all analytical data, cruise reports; QA/QC reports for chemistry, toxicity, TOC, and grain size data.

(*)Pending analytical data from Leg 44 (sediment water interface toxicity test and selected chemistry) to be submitted as part of data report from Legs 42-46.

**BPTCP Confirmation FY 95/96/Regions 1, 2, 3, 4, and 8 [54]**

**Legs**

42 through 46

**Sampling dates and regions**

Leg 42- 4/17/96 through 4/18/96 - Region 1 (Humboldt Bay)
Leg 43- 5/9/96 - Region 3 (Monterey Bay ports/harbors)
Leg 44- 6/10/96 through 6/11/96 - Region 2 (S.F. Bay)
Leg 45- 6/19/96 through 6/20/96 - Regions 4 & 8
Leg 46- 7/17/96 through 7/18/96 - Region 4 (Port of L.A.)

**Number**

Leg 42: 10 sediment samples; 10 resident organism tissue samples
Leg 43: 9 sediment samples; 1 water column sample
Leg 44: 10 sediment cores for sediment/water interface tests
Leg 45: 12 sediment samples
Leg 46: 15 sediment samples, including core samples

**Chemical analysis**

Organic analysis completed on 40 sediment & 8 pore water samples legs 42, 43, 45, and 46

Metal analysis completed on 37 sediment & 8 pore water samples legs 42, 43, 45, and 46; lead (only) completed on 4 stations leg 42; TBT (only) completed on 8 stations legs 43, 45; SEM-AVS analysis pending (expected by 4/97) for above legs 42, 43, 45, and 46

TOC & grain size analysis completed on 46 stations from above legs 42, 43, 45, and 46

**Toxicity testing**

Amphipod survival in solid phase completed on 41 stations from legs 42, 43, 45, and 46

Urchin larvae development in sediment/water interface completed on 16 stations from legs 42, 44, 46

Urchin larvae development in pore water completed on 12 stations

Bivalve development in water column completed on 1 station from leg 43

**Benthic community**

Benthic community analysis authorized on 32 samples; completion of final benthic community data set pending QA/QC evaluation of data

**Products**

Data Reports for legs 38-42 **[54]**

Toxicity Test QA/QC Reports for Legs 42-46 **[54A]**

Toxicity Data Report for legs 42-46 (task Order 1-5, 2-11,3-5,4-6, 4-7, 8-5) **[54B]**

QA/QC Pore water Trace metals and DOC Chemical Analysis for leg 45 **[54C]**

**BPTCP Confirmation (All Regions Except Region 5) and Screening (Regions 5 and 3)**

**Legs** 47 through 56

**Sampling dates and regions** link: **fieldata.dbf**

Leg 47- 12/37/96 through 12/16/96 - Region 1 (Bodega Bay) and Region 9
Leg 48- 2/4/97 through 2/6/97 - Region 4
Leg 49- 3/17/97 through 4/3/97 - Region 5 (Initial Screening)
Leg 50- 4/1/97 through 4/3/97- Region 2
Leg 51- 4/15/97 through 4/17/97 - Region 2
Leg 52- 5/7/97 through 5/15/97 - Region 3 (Tembladero Slough Screening)
Leg 53- 5/12/97 through 5/15/97 - Region 4
Leg 54- 8/20/97 through 8/21/97 - Regions 4 & 8
Leg 55- 10/6/97 - Region 2
Leg 56- 12/3/97 - Region 2

**Number** - 115 sediment samples

Leg 47: 13 sediment samples (Region 9- 9; Region 1-4)
Leg 48: 23 sediment samples
Leg 49: 18 sediment samples; 18 water column samples
Leg 50: 15 sediment samples, 5 bioaccumulation samples
Leg 51: 13 sediment samples, 1 TIE sample, 2 bioaccumulation samples

Leg 52: 7 sediment samples; 7 water column samples, 1 TIE sample
Leg 53-12 sediment samples; 7 fish tissue samples, 4 bioaccumulation samples
Leg 54- 7 sediment samples (Region 4- 2; Region 8- 5); 5 water column samples
Leg 55- 4 sediment samples; 3 bioaccumulation samples
Leg 56- 3 sediment samples

**Chemical analysis** link: **Chm47_56.dbf**

PAH, PCB and pesticide analyses -- 69 sediment samples; PCB only analyses -- 83 additional sediment samples.
Metal analysis -- 57 sediment samples
AVS/SEM analyses -- 53 sediment samples.
TOC & grain size analysis -- 103 sediment samples
Pore water metal analyses -- 2 pore water samples
PAH only analyses -- 2 pore water samples.
Fourteen metal analyses and 38 organic analyses -- tissue samples. Link: **Tiss1_56.dbf**

**Toxicity testing** link: **Tox47_56.dbf**

Amphipod survival in solid phase exposures -- 112 samples
Urchin larvae development in sediment/water interface core -- 79 core samples.
Daphnid survival in subsurface water -- 4 samples.
Daphnid survival in pore water -- 1 sample.
Daphnid survival in sediment/water interface cores -- 21 samples
Mysid survival in water -- one sample.

**Benthic community**

Analyses on 59 samples (3 replicates) completed link: **Ben1_56.dbf**

**Products**

- Hard copy data reports for Legs 47 through 56 submitted to SWRCB August 1998; includes all analytical data, cruise reports; qa/qc reports for chemistry, toxicity, toc, and grain size data.

**Other BPTCP Data and Reports Completed to Date**

QA/QC Tissue Metal Analysis - Humboldt Bay **[55]**

QA/QC Sediment Chemistry (Metals, AVS/SEM) San Francisco Bay, Santa Cruz Harbor, Monterey Harbor, and Southern California **[56]**

Environmental Chemistry Quality Assurance and Data report for Group 17a. Sediment, Tissue, and Water Analysis. **[57]**

Environmental Chemistry Quality Assurance and Data report for 1996 Group 17b. Sediments. **[58]**

Environmental Chemistry Quality Assurance and Data report for 1996 Group 18. Pore Water Analysis. **[59]**

Environmental Chemistry Quality Assurance and Data report for 1996 Group 19. Sediment Analysis. **[60]**

QA/QC San Francisco Bay and Southern California (#19 and #20). **[61]**

Environmental Chemistry Quality Assurance and Data report for 1996 Group 20. Sediment Analysis. **[62]**

Environmental Chemistry Quality Assurance and Data report for 1996 Group 21. Sediment Analysis. **[63]**

QA/QC Report for San Francisco Bay (Batch 21 Mercury Analysis). **[64]**

Cruise reports for legs 42 43, 4, 45, 46,
47, 48, 49, 50, 51,52, 53, and 54 **[65]**

Bloom, N., and E. J. Von der Geest. 1994,1995, 1996, 1997. Total Mercury Analysis Data Results. Original Data Sheets. Frontier Geosciences Environmental Research Corp. **[99]**

DFG Water Pollution Control Laboratory. 1996. Toxic Substance Monitoring Program. Trace Elements in Fish Data. **[100]**