PUBLIC NOTICE

US Army Corps
of Engineers
New York District
Jacob K. Javits Federal Building
New York, N.Y. 10278-0090
ATTN: Regulatory Branch

In replying refer to :
Public Notice Number: 92-07650-OD
Issue Date: 09 APRIL 1993
Expiration Date: 07 MAY 1993

TO WHOM IT MAY CONCERN:

The New York District Corps of Engineers has received an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended (33 U.S.C. 1413).

APPLICANT: **Bayway Refining Company**
1400 Park Avenue
Linden, New Jersey 07036

WORK: **Maintenance dredging and ocean disposal without barge overflow**

WATERWAY: **Arthur Kill**

LOCATION: **City of Linden, Union County, New Jersey**

A detailed description and plans of the applicant's activity are enclosed to assist in your review.

The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the activity must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the activity will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an

Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

ALL COMMENTS REGARDING THE PERMIT APPLICATION MUST BE PREPARED IN WRITING AND MAILED TO REACH THIS OFFICE BEFORE THE EXPIRATION DATE OF THIS NOTICE, otherwise, it will be presumed that there are no objections to the activity.

Any person may request, in writing, before this public notice expires, that a public hearing be held to collect information necessary to consider this application. Requests for public hearings shall state, with particularity, the reasons why a public hearing should be held. It should be noted that information submitted by mail is considered just as carefully in the permit decision process and bears the same weight as that furnished at a public hearing.

Pursuant to Section 7 of the Endangered Species Act (16 U.S.C. 1531) and based upon a review of the latest published version of the threatened and endangered species listing, a preliminary determination is that the activity under consideration will not affect those species listed or their critical habitat.

Based upon a review of the latest published version of the National Register of Historic Places, there are no known sites eligible for, or included in, the Register within the permit area. Presently unknown archaeological, scientific, prehistorical or historical data may be lost by work accomplished under the required permit.

Reviews of activities pursuant to Section 404 of the Clean Water Act will include application of the guidelines promulgated by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act and the applicant will obtain a water quality certificate or waiver from the appropriate state agency in accordance with Section 401 of the Clean Water Act prior to a permit decision.

Pursuant to Section 307 (c) of the Coastal Zone Management Act of 1972 as amended [16 U.S.C. 1456 (c)], for activities under consideration that are located within the coastal zone of a state which has a federally approved coastal zone management program, the applicant has certified in the permit application that the activity complies with, and will be conducted in a manner that is consistent with, the approved state coastal zone management program. By this public notice, we are requesting the state's concurrence with, objection to, or waiver of the applicant's certification. No permit

decision will be made until one of these actions occur. For activities within the coastal zone of New Jersey the applicant's certification and accompanying information is available from the New Jersey Department of Environmental Protection, Bureau of Coastal Project Review, Room 702, L & I Building, CN 401, New Jersey 08625, Telephone Number (609) 292-2121. Comments regarding the applicant's certification should be so addressed.

In addition to any required water quality certificate and coastal zone management program concurrence, the applicant has obtained or requested the following governmental authorization for the activity under consideration:

Waterfront Development Permit from the New Jersey Department of Environmental Protection and Energy

It is requested that you communicate the foregoing information concerning the activity to any persons known by you to be interested and who did not receive a copy of this notice.

If you have any questions concerning this application, you may contact this office at (212) 264-0184 and ask for Mr. Mark Roth.

FOR THE DISTRICT ENGINEER:

Joseph J. Seebode
Chief, Regulatory Branch

Enclosures

DESCRIPTION OF WORK

The applicant, the Bayway Refining Company, proposes to maintenance dredge their facility on the Arthur Kill in the City of Linden, Union County, New Jersey. The applicant proposes to dredge by clamshell bucket without barge overflow, a total of approximately 11,318 cubic yards of material from three irregularly shaped areas, to a maximum depth of 25 feet below the plane of mean low water with two feet of allowable overdepth as shown on the attached drawings. Approximately 3,095 cubic yards of material would be removed from Area 1, approximately 5,935 cubic yards of material would be removed from Area 2 and approximately 2,288 cubic yards of material would be removed from Area 3.

The proposal includes ocean disposal of all 11,318 cubic yards of dredged material.

The purpose of the project is to permit the continued use of three barge berths at a hydrocarbon offloading/onloading facility. The permit for the proposed work, if issued, will authorize, on an initial basis only, the dredging as specified in this notice. Any subsequent maintenance dredging during the life of the permit will require that the dredged material comply with the appropriate criteria in effect at that time, and will be dependent upon the availability of an approved disposal site.

Consideration is being given to issuance of a three year permit for the dredging with review of compliance with the criteria in effect prior to each disposal.

The dredged material would be transported by dump scows and deposited by bottom dumping process at the Mud Dump Site as designated by the U.S. Environmental Protection Agency (USEPA), as shown on the attached maps. The Mud Dump Site has an area of 2 square miles and an average depth of 72 feet, having its corner points located at:

LATITUDE	LONGITUDE
40° 23' 48" North	73° 51' 28" West
40° 21' 48" North	73° 50' 00" West
40° 21' 48" North	73° 51' 28" West
40° 23' 48" North	73° 50' 00" West

This site has been used for disposal of dredged material since 1914 and has disposal depths within the site ranging from 50 to 100 feet below mean low water. The U.S. Coast Guard conducts surveillance of ocean dumping at the Mud Dump Site.

It is estimated that since 1976 approximately 7.0 million cubic yards of material have been dumped annually at the present disposal site. The disposal of dredged material has created a mound of sediment at the site which, between 1936 and 1986, has resulted in an accumulation of about 44 feet of material.

The applicant has demonstrated the need for the proposed ocean dumping based on the availability of practicable alternative methods of disposal. As stated in the Criteria (40 CFR 227.16(b)) "...alternative methods of disposal are practicable when they are available at reasonable incremental cost and energy expenditures which need not be competitive with the costs of ocean dumping, taking into account the environmental impacts associated with the use of alternatives to ocean dumping...." The New York District has evaluated the practicability of potential disposal alternatives in a report entitled "Dredged Material Disposal Within the New York District." The alternatives considered include land disposal, use as sanitary landfill cover, disposal in subaqueous borrow pits (and possible capping with clean material), creation of islands and/or wetlands, disposal on beaches or wetlands, transport and placement in deep mines, and incineration. Of these, only land disposal is considered a potentially viable alternative at the present time for the particular material proposed for disposal.

The applicant has evaluated methods of upland disposal of the dredged material as an alternative to ocean disposal stating that there is no vacant land in the vicinity of the project area upon which the dredged material could be disposed of or dewatered. Therefore, it would become necessary to transport this material by truck in a semi-fluid state to some available inland disposal site. If such a site could be found, the applicant has determined that the logistics of dealing with their associated constraints (i.e., drying of material, trucking dumping fees, upland disposal approvals, etc.) would increase the projected cost of the project beyond the point that would make the project economically feasible.

TESTING-GENERAL COMMENTS

The proposed dredge area was subdivided into three areas, Areas 1 through 3 for the purpose of sampling and testing the material to be dredged. The results of the sediment testing from each discrete Area, reported in the pages to follow, will be displayed separately.

EPA Region II under the authority of 40 CFR Section 225.2(b) has requested that liquid phase chemical analysis be performed for mercury, cadmium, PCBs, DDT and petroleum hydrocarbons. The results of this analysis are shown in Table 1 for each Area.

Bioassay Results: In accordance with EPA's Ocean Dumping Regulations, published in the Register on 11 January 1977, **suspended particulate phase** and **solid phase bioassays** are required for the proposed dredged material utilizing the test species as discussed below. The results of these tests are presented in Table 2 for each Area.

The suspended particulate phase is considered to be the supernatant remaining after one hour of undisturbed settling of the mixture resulting from a vigorous 30 minute agitation of one part bottom sediment from the dredging site with four parts water collected from the dredging site or the disposal site, as appropriate for the type of dredging operation. The solid phase is considered to be all material settling to the bottom within one hour. For this permit application, natural seawater was substituted for disposal site water in the solid phase bioassay. This substitution conforms with the procedures in the 1984 Regional Implementation Manual of Ecological Evaluation of Proposed Discharge of Dredged Material Into Ocean Waters published by USEPA and the Corps of Engineers.

For the suspended particulate phase bioassay, lethal concentrations (LC50s), those concentrations of suspended particulate phase resulting in 50% mortality, were determined for the animal species Acartia tonsa, Mysidopsis bahia and Menidia menidia.

Based on these values, the LPC (Limiting Permissible Concentration) values are determined by applying a safety factor of 100 (0.01 times the critical EC50 or LC50). The material can be considered for disposal only if the concentration in the disposal water in both liquid and suspended particulate phases is diluted to below that of the LPC after 4 hours of initial mixing.

For the suspended particulate phase, Arcatia tonsa was the most sensitive of the three species examined in all three areas. In Area 1, the LC50 was found to be 31.2% of the 100% suspended particulate phase after 96 hours. The resulting LPC for Area 1 was found to be 0.31%. In Area 2, the LC50 was found to be 53.3% of the 100% suspended particulate phase after 96 hours. The resulting LPC for Area 2 was found to be 0.53%. In Area 3, the LC50 was found to be 27.6% of the 100% suspended particulate phase after 96 hours. The resulting LPC for Area 3 was found to be 0.28%.

The expected dilution of the proposed dredged material after disposal at the Mud Dump Site has been evaluated by use of the Tetra Tech computer model. A description of the model has been published as Technical Report D-78- 47 of the Corps' Dredged Material Research Program, and is entitled Evaluation and Calibration of the Tetra Tech Dredged Material Disposal Models Based on Field Data. The New York District requested that a study be conducted which would give example dilutions resulting from typical disposal operations and dredged materials found in the New York District. This study has been completed and is entitled Discussion of Dredged Material Disposal Models and Their Application for the New York District.

Using the constraints in this study, for all three areas, most closely approximating those of the disposal operation for this proposed dredged material, the dilution after four hours would be 0.0032%. The dilution after four hours of 0.0032% is below the LPC for Area 1 of 0.31% for the suspended particulate phase. The dilution after four hours of 0.0032% is below the LPC for Area 2 of 0.53% for the suspended particulate phase. The dilution after four hours of 0.0032% is below the LPC for Area 3 of 0.28% for the suspended particulate phase.

For the solid phase bioassay, the results are evaluated for (biological and statistically significant) differences in mortality between organisms subjected to both proposed dredged test sediment and a reference sediment. The reference sediment represents existing background conditions in the vicinity of the dumpsite, but away from the influence of any disposal operation. The 1984 Regional Implementation Manual published by USEPA, Region II, and the New York District Corps of Engineers, specifies that differences in survival of the organisms in the reference and test treatments be evaluated either individually by species or on a pooled community basis. In addition, the Manual has defined the LPC for the solid phase to be exceeded when the difference in mortality between animals in the reference and test sediments is statistically significant ($p=0.05$) and greater than 10 percent.

As indicated in Table 2, differences in mortality between reference and test organisms were neither statistically significant at the 95% confidence level nor greater than 10% on an individual species basis for Paleomonetes pugio, Mercenaria mercenaria, and Nereis virens.

Body burden analyses of the solid phase organisms surviving the 10 day test to estimate bioaccumulation potential were made for mercury, cadmium, PCBs, DDT, and petroleum hydrocarbons. Mean levels for each constituent occurring in the test animals exposed to the proposed dredged material and to the reference sediment are shown in Table 3 for each area (reference values are in parentheses). Detection limits are shown for each of the chemical constituents analyzed.

AREA 1

Based upon analyses of 3 sediment samples submitted by the applicant, the character of the dredged material is as follows: 4.0% sand, 65.7% silt and 30.2% clay.

TABLE 1-AREA 1

Liquid Phase Chemical Analysis Results (ppb)

CONSTITUENTS	D.L.	ELUTRIATE	SITE WATER
Mercury	(0.2)	N.D.	N.D.
Cadmium	(0.1)	N.D.	N.D.
PCB	(0.1)	N.D.	N.D.
Petroleum hydrocarbons	(50.0)	N.D.	N.D.
DDT	(0.05)	N.D.	N.D.

D.L. - Detection Limits
N.D. - Not Detected at the Detection Limit

As indicated in Table 2 (results from Area 1), solid phase bioassay results for Nereis virens showed greater mortality in test than in reference sediment. This mortality was statistically significant and less than 10%.

TABLE NUMBER 2-AREA 1: BIOASSAY RESULTS APPLICATION NUMBER: 92-07650-OD

Suspended particulate phase (96 Hour Test)

	50 (critical)	LPC after 4 hours	Dilution after 4 hours
Acartia tonsa	31.2%	0.31%	0.0031
Mysidopsis bahia	62.2%	0.62%	0.0031
Menidia menidia	74.4%	0.74%	0.0031

Solid Phase (10 days)

	% Survival in reference	% Survival in test	Difference (Reference-Test)	Is difference statistically significant? (p=0.05)
Palaemonetes pugio	96.4	93.8	2.6	NO
Mercenaria mercenaria	100.0	99.0	1.0	NO
Nereis virens	99.0	92.0	7.0	YES
TOTAL COMMUNITY	98.5	94.9	3.5	YES

LC 50-Lethal Concentration resulting in 50% mortality
LPC-Limiting Permissible Concentration (0.01 times the critical LC 50)

TABLE 3-AREA 1

Body Burden Levels (ppm) in Test Species

Constituents	(D.L.)	Palaemonetes pugio	Nereis virens	Mercenaria mercenaria
Mercury	(0.20)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Cadmium	(0.25)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
PCB	(0.04)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Petroleum hydrocarbons	(0.10)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
DDT	(0.02)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)

D.L. - Detection Limits
N.D. - Not detected at the Detection Limit

Bioaccumulation studies demonstrated that dioxin levels (in worm tissue) are above 1 part per trillion (pptr) wet weight for test organisms (ranging from 2.2 to 7.1, average 4.7 pptr wet weight).

AREA 2

Based upon analyses of 4 sediment samples submitted by the applicant, the character of the dredged material is as follows: 2.6% sand, 64.8% silt and 32.6% clay.

TABLE 1-AREA 2

Liquid Phase Chemical Analysis Results (ppb)

CONSTITUENTS	D.L.	ELUTRIATE	SITE WATER
Mercury	(0.2)	N.D.	N.D.
Cadmium	(0.1)	N.D.	N.D.
PCB	(0.1)	N.D.	N.D.
Petroleum hydrocarbons	(50.0)	N.D.	N.D.
DDT	(0.05)	N.D.	N.D.

D.L. - Detection Limits
N.D. - Not Detected at the Detection Limit

TABLE NUMBER 2-AREA 2: BIOASSAY RESULTS APPLICATION NUMBER: 92-07650-OD

Suspended particulate phase (96 Hour Test)

	50 (critical)	LPC after 4 hours	Dilution after 4 hours
Acartia tonsa	53.3%	0.53%	0.0032
Mysidopsis bahia	75.0%	0.75%	0.0032
Menidia menidia	70.3%	0.70%	0.0032

Solid Phase (10 days)

	% Survival in reference	% Survival in test	Difference (Reference-Test)	Is difference statistically significant? (p=0.05)
Palaemonetes pugio	96.4	93.4	3.0	NO
Mercenaria mercenaria	100.0	100.0	0.0	NO
Nereis virens	99.0	93.0	6.0	YES
TOTAL COMMUNITY	98.5	95.5	3.0	YES

LC 50-Lethal Concentration resulting in 50% mortality
LPC-Limiting Permissible Concentration (0.01 times the critical LC 50)

As indicated in Table 2 (results from Area 2), solid phase bioassay results for Nereis virens showed greater mortality in test than in reference sediment. This mortality was statistically significant and less than 10%.

TABLE 3-AREA 2

Body Burden Levels (ppm) in Test Species

Constituents	(D.L.)	Palaemonetes pugio	Nereis virens	Mercenaria mercenaria
Mercury	(0.20)	N.D.(N.D.)	N.D.(N.D.)	N.D.(N.D.)
Cadmium	(0.25)	N.D.(N.D.)	N.D.(N.D.)	N.D.(N.D.)
PCB	(0.04)	N.D.(N.D.)	N.D.(N.D.)	N.D.(N.D.)
Petroleum hydrocarbons	(0.10)	N.D.(N.D.)	N.D.(N.D.)	N.D.(N.D.)
DDT	(0.02)	N.D.(N.D.)	N.D.(N.D.)	N.D.(N.D.)

D.L. - Detection Limits
N.D. - Not detected at the Detection Limit

Bioaccumulation studies demonstrated that dioxin levels (in worm tissue) are above 1 part per trillion (pptr) wet weight for test organisms (ranging from 2.5 to 7.3, average 4.8 pptr wet weight).

AREA 3

Based upon analyses of 3 sediment samples submitted by the applicant, the character of the dredged material is as follows: 3.8% sand, 64.4% silt and 31.8% clay.

TABLE NUMBER 2-AREA 3: BIOASSAY RESULTS APPLICATION NUMBER: 92-07650-OD

Suspended particulate phase (96 Hour Test)

	LC 50 (critical)	LPC after 4 hours	Dilution after 4 hours
Acartia tonsa	27.6%	0.28%	0.0047
Mysidopsis bahia	40.3%	0.40%	0.0047
Menidia menidia	29.4%	0.29%	0.0047

Solid Phase (10 days)

	% Survival reference	% Survival in test	Difference (Reference-Test)	Is difference statistically in significant? (p=0.05)
Palaemonetes pugio	96.4	94.0	2.4	NO
Mercenaria mercenaria	100.0	100.0	0.0	NO
Nereis virens	99.0	93.0	6.0	YES
TOTAL COMMUNITY	98.5	95.7	2.8	NO

LC 50-Lethal Concentration resulting in 50% mortality
LPC-Limiting Permissible Concentration (0.01 times the critical LC 50)

TABLE 1-AREA 3

Liquid Phase Chemical Analysis Results (ppb)

CONSTITUENTS	D.L.	ELUTRIATE	SITE WATER
Mercury	(0.2)	N.D.	N.D.
Cadmium	(0.1)	N.D.	N.D.
PCB	(0.1)	N.D.	N.D.
Petroleum hydrocarbons	(50.0)	N.D.	N.D.
DDT	(0.05)	N.D.	N.D.

D.L. - Detection Limits
N.D. - Not Detected at the Detection Limit

As indicated in Table 2 (results from Area 3), solid phase bioassay results for Nereis virens showed greater mortality in test than in reference sediment. This mortality was statistically significant and less than 10%.

TABLE 3-AREA 3

Body Burden Levels (ppm) in Test Species

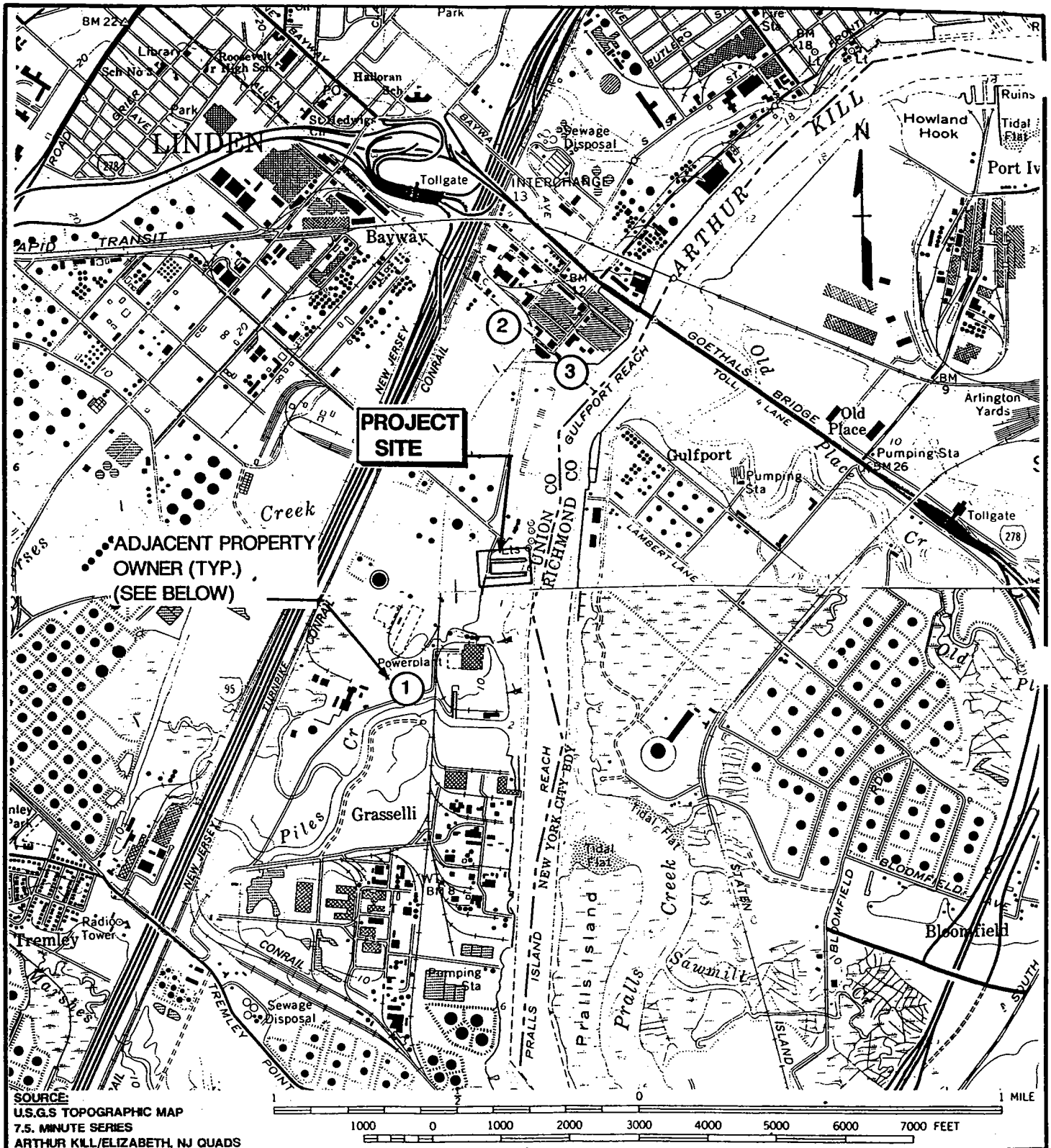
Constituents	(D.L.)	Palaemonetes pugio	Nereis virens	Mercenaria mercenaria
Mercury	(0.20)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Cadmium	(0.25)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
PCB	(0.04)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Petroleum hydrocarbons	(0.10)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
DDT	(0.02)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)

D.L. - Detection Limits
N.D. - Not detected at the Detection Limit

Bioaccumulation studies demonstrated that dioxin levels (in worm tissue) are above 1 part per trillion (pptr) wet weight for test organisms (ranging from 1.4 to 5.7, average 3.3 pptr wet weight).

SUMMARY

In summary, the tissue from 28 day Nereis virens bioaccumulation studies had wet weight 2,3,7,8 TCDD (dioxin) concentrations above 1 pptr and less than 10 pptr. Therefore, the dredged material from the project area is eligible for restricted disposal at the Mud Dump site. The dredged material from each area would be separately and expeditiously capped. A final cap would be placed over the entire volume of dredged material. Additional maintenance dredging under reauthorization must adhere to any revisions in criteria for ocean disposal of dredged material.



SOURCE:
U.S.G.S TOPOGRAPHIC MAP
7.5. MINUTE SERIES
ARTHUR KILL/ELIZABETH, NJ QUADS

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

PURPOSE: BARGE PIERS
MAINTENANCE DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

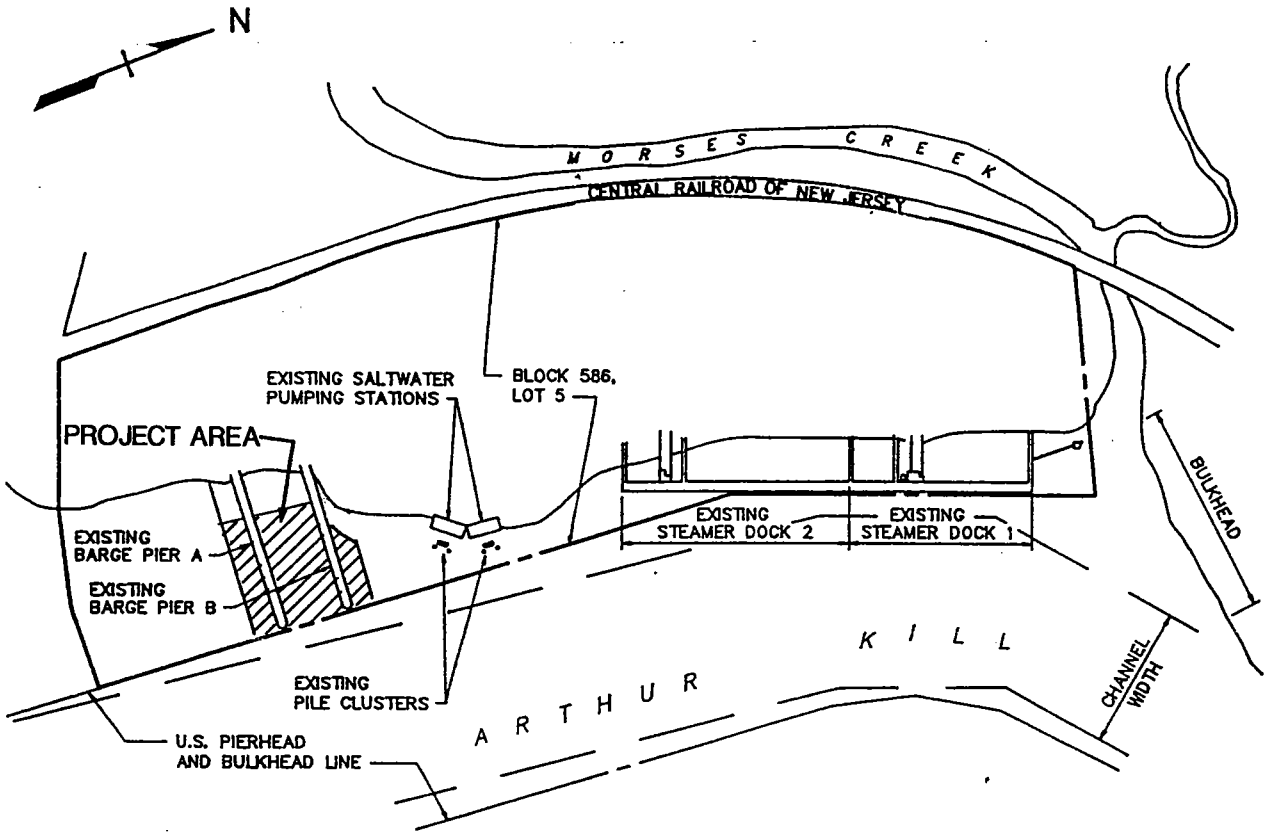
VICINITY MAP

BAYWAY REFINING COMPANY
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINING
MARINE PROJECTS

IN: ARTHUR KILL
AT: LINDEN CITY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: BAYWAY REFINING CO.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

SHEET 1 OF 5 DATE 1-8-92 REV. 3-17-93



PURPOSE: **BARGE PIERS MAINTENANCE DREDGING**

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:

1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

LOCATION PLAN BARGE PIERS A AND B

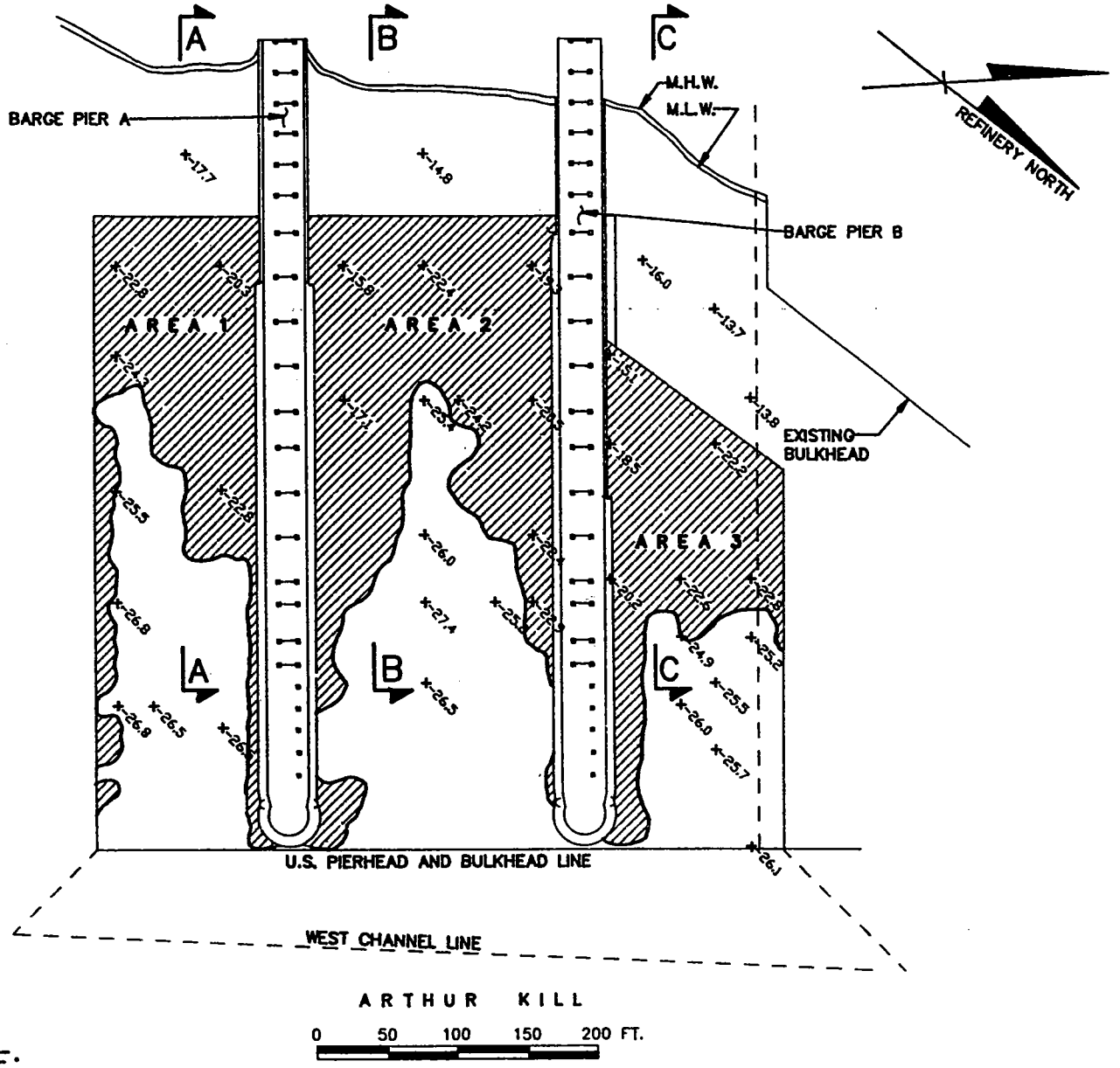
BAYWAY REFINING COMPANY
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINING MARINE PROJECTS

IN: ARTHUR KILL
AT: LINDEN CITY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: BAYWAY REFINING CO.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

SHEET 2 OF 5 DATE 5-11-92 REV. 3-17-93

402-01\FIG\FIG-2C (600)



NOTE:

1. SOUNDINGS TAKEN BY EXXON PERSONNEL USING RAYTHEON FATHOMETER MODEL 719.
2. ALL STATIONS (0+00, 0+25, ETC.) ARE ± 1'-0".
3. SOUNDINGS REFER TO LOCAL MEAN LOW WATER.
4. ELEVATIONS BASED ON BAYWAY REFINERY DATUM, TO CONVERT TO U.S.G.S. SUBTRACT 2.35'.
5. ALL ELEVATIONS ARE (-) MINUS ELEVATIONS.
6. DREDGE TO -25'-0".

DREDGE QUANTITIES - DREDGE TO -25'-0"	
AREA 1	3,095.3 CU. YDS.
AREA 2	5,935.2 CU. YDS.
AREA 3	2,287.6 CU. YDS.
****TOTAL	11,318.1 CU. YDS.

LEGEND: AREAS TO BE DREDGED

REFERENCE:
M.L.W. =MEAN LOW WATER EL. 0.0'
M.H.W. =MEAN HIGH WATER EL. 4.9'

PURPOSE: BARGE PIERS DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

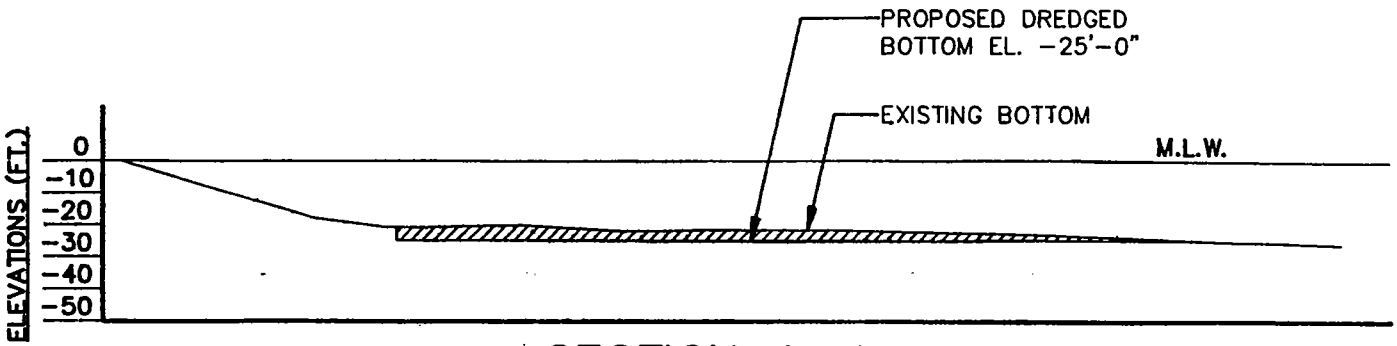
BARGE PIERS A & B SOUNDING GRID AND DREDGING AREA DELINEATION

BAYWAY REFINING COMPANY
1400 PARK AVENUE
LINDEN, NJ 07036

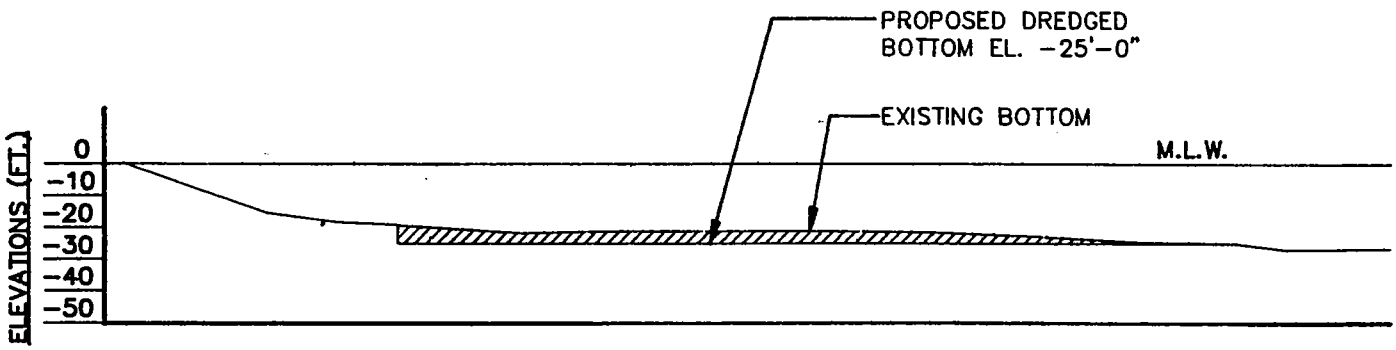
PROPOSED BAYWAY REFINING MARINE PROJECTS

IN: ARTHUR KILL
AT: LINDEN CITY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: BAYWAY REFINING CO.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

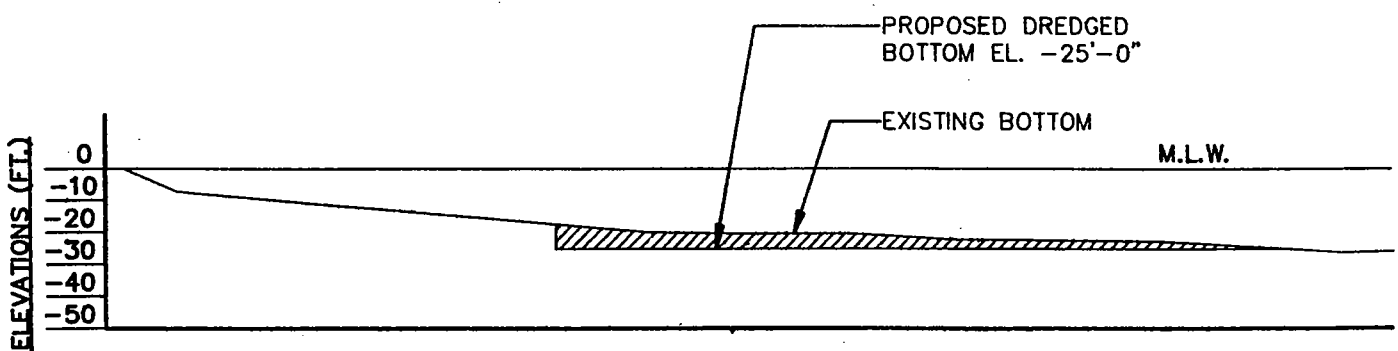
SHEET 3 OF 5 DATE 3-3-92 REV. 3-17-93



SECTION A–A



SECTION B–B



SECTION C–C

LEGEND: AREAS TO BE DREDGED

0 25 50 75 100 FT.
HORIZONTAL SCALE

REFERENCE:
M.L.W. =MEAN LOW WATER EL. 0.0'
M.H.W. =MEAN HIGH WATER EL. 4.9'

PURPOSE: BARGE PIERS DREDGING

DATUM: MEAN LOW WATER

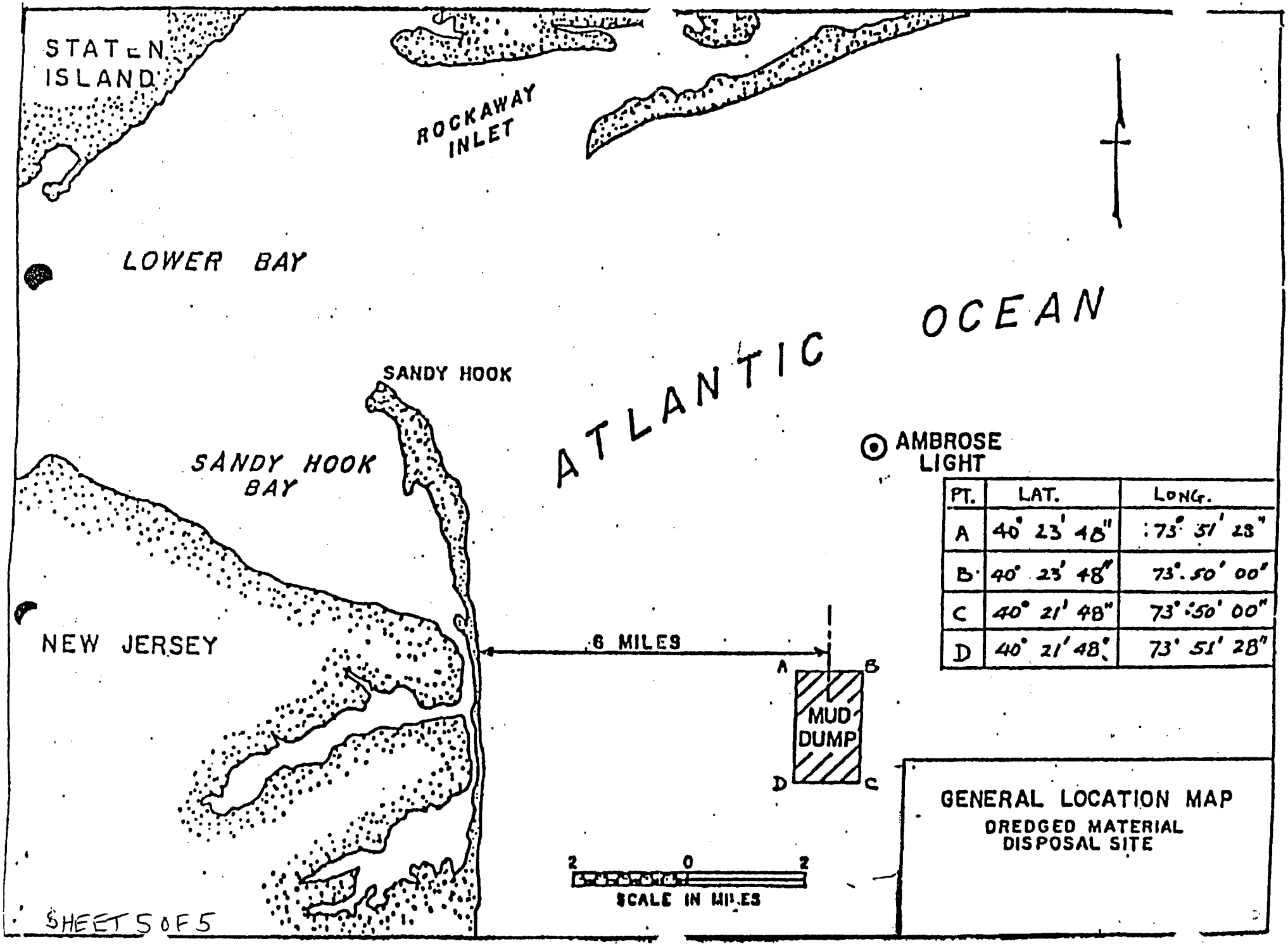
ADJACENT PROPERTY OWNERS:
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

BARGE PIERS A & B SECTIONS

BAYWAY REFINING COMPANY
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINING MARINE PROJECTS
IN: ARTHUR KILL
AT: LINDEN CITY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: BAYWAY REFINING CO.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

SHEET 4 OF 5 DATE 3-3-92 REV. 3-17-93



PT.	LAT.	LONG.
A	40° 23' 48"	73° 51' 28"
B	40° 23' 48"	73° 50' 00"
C	40° 21' 48"	73° 50' 00"
D	40° 21' 48"	73° 51' 28"

GENERAL LOCATION MAP

DREDGED MATERIAL DISPOSAL SITE

SHEET 5 OF 5

EXXON USA, INC.
ARTHUR KILL
RECEIVED MAY 26, 1992
AND PRE - APPLICATION

Exxon - Apr 92 Pre Application
Linden NJ

U.S. ARMY CORPS OF ENGINEERS
PERMIT APPLICATION

PURSUANT TO

SECTION 103 OF THE MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT & SECTION 10 OF THE RIVERS AND HARBORS ACT

PREPARED FOR

EXXON COMPANY, U.S.A.

EXXON BAYWAY REFINERY
LINDEN, NEW JERSEY



EXXON

MAY 1992

PREPARED BY

PAULUS, SOKOLOWSKI & SARTOR, INC.

CONSULTING ENGINEERS & ENVIRONMENTAL PLANNERS

U.S. ARMY CORPS OF ENGINEERS
PERMIT APPLICATION

PURSUANT TO

SECTION 103 OF THE MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT & SECTION 10 OF THE RIVERS AND HARBORS ACT

PREPARED FOR

EXXON COMPANY, U.S.A.

EXXON BAYWAY REFINERY
1400 PARK AVENUE
UNION COUNTY,
LINDEN, NEW JERSEY



EXXON

PREPARED BY:

PAULUS, SOKOLOWSKI & SARTOR, INC.
CONSULTING ENGINEERS & ENVIRONMENTAL PLANNERS
67A MOUNTAIN BOULEVARD EXT.
P.O. BOX 4039
WARREN, NEW JERSEY 07060

MAY 1992

1.0 LETTER OF TRANSMITTAL

EXXON

PAULUS
SOKOLOWSKI
and SARTOR, INC.
CONSULTING ENGINEERS

67A MOUNTAIN BOULEVARD EXTENSION
P.O. BOX 4039 • WARREN, NEW JERSEY 07059-0039
(908) 560-9700 • FAX (908) 560-9768

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May 27, 1992
1517-001-24

Mr. Joseph J. Seebode, Chief
Regulatory Branch
U.S. Army Corps of Engineers
Jacob K. Javits Federal Building, Room 1937
New York, New York 10278-0090

Re: Application for Department of the Army Approval
for Maintenance Dredging of Barge Piers A & B Area, with Ocean Disposal
Pursuant to Section 10 of the Rivers and Harbors Act and
Section 103 of the Marine Protection, Research and Sanctuaries Act
Exxon Bayway Refinery
Linden, Union County, New Jersey

Dear Mr. Seebode:

On behalf of Exxon Company, U.S.A., (Exxon), Paulus, Sokolowski and Sartor, Inc. (PS&S) is pleased to submit this application requesting Department of the Army authorization for maintenance dredging, with ocean disposal of the dredged material, from Areas 1, 2 and 3 of Barge Piers A & B at the Exxon Bayway Refinery located on the Arthur Kill in Linden, Union County, New Jersey. This request is being made pursuant to Section 10 of the Rivers and Harbors Act and Section 103 of the Marine Protection, Research and Sanctuaries Act.

As detailed in this permit application, the proposed maintenance dredging activity is necessary to restore navigable depths at Barge Piers A and B in order to continue safe marine transfer operations at the Exxon Bayway Refinery and relieve the current shoaling/siltation problem. In order to restore navigable depths, approximately 11,400 cubic yards of dredged material must be removed. This area has been historically dredged with ocean disposal.

1517-001-24\PDLEXXO.R01

Please note that on February 14, 1991 Exxon received a Waterfront Development Permit and Water Quality Certification (No. 2009-90-0003.2) from the New Jersey Department of Environmental Protection and Energy for maintenance dredging at Barge Piers A&B with ocean disposal.

Exxon has not performed maintenance dredging at Barge Piers A and B since June 1985, when the area was maintenance dredged under ACOE Permit #12883 which expired in May of 1986. Similar facilities in the Arthur Kill usually require dredging every two years to maintain navigable depths. Due to current silting conditions, the depths at the Barge Piers are inadequate for a fully loaded barge to dock. The barges are now loaded to less than half their capacity which has resulted in an increase in barge traffic leaving and entering the Bayway facility. Additional barge traffic and marine transfer operations, which is the consequence of decreased barge draft depths along Barge Piers A and B, results in a substantial increase in transportation and production costs.

In addition to the required increase in barge traffic on the Arthur Kill, there are an associated increase in the numbers of transfers of oil to the barges from large tankers located in Raritan Bay as a result of Exxon only being able to load the barges to less than half their capacity. As a result, the potential for accidental spills and leakages associated with additional cargo handling operations in the adjacent waterways increases.

Exxon and PS&S has been working with the ACOE over the past years to address dredge material sampling and analysis issues at the facility. An amended sampling scheme for the Barge Pier area and required testing was approved by the ACOE on December 9, 1991. Sample collection and testing was recently completed, with favorable results for ocean disposal.

PS&S believes that this permit application and accompanying information will be sufficient for the ACOE to declare the application complete for review and issue the public notice. Exxon is planning to initiate the proposed dredging as soon as possible due to the current silting conditions which have greatly hindered their operations at the Barge Piers. We would appreciate your timely review and approval of this permit application.

If you have any questions concerning this application, please do not hesitate to contact us.

Very truly yours,

PAULUS, SOKOLOWSKI AND SARTOR, INC.

Ingro Desvousges
Project Manager

P. Steve Oliver
Senior Associate and Division Manager
Environmental Permitting and Planning

cc: Thomas Accetta, Exxon
David Charette, PS&S
Bruce Jones, Exxon
Pat Shade, Exxon

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A. Alternative Analysis Matrix

B. One-Mile Radius Map

C. Project Drawings

D. Project Photographs

E. Dredge Material Analysis

2.0 PROJECT SUMMARY

EXXON

2.0 PROJECT SUMMARY

The applicant, Exxon Company, U.S.A. (Exxon), is applying to the U.S. Army Corps of Engineers (ACOE) for a permit to maintenance dredge, with ocean disposal of the dredged material, Areas 1, 2 and 3 of Barge Piers A & B at Exxon's Bayway Refinery located in the Arthur Kill in Linden, Union County, New Jersey pursuant to Section 10 of the Rivers and Harbors Act and Section 103 of the Marine Protection, Research and Sanctuaries Act. These areas have been historically dredged with ocean disposal. The applicant proposes to dredge by clamshell bucket an initial total of approximately 11,400 cubic yards of material from Areas 1, 2 and 3 in the Barge Pier area to an approximate depth of 25 feet below the plane of mean low water, with two feet of allowable overdredge. Approximately 3,100 cubic yards from Area 1, 6,000 cubic yards from Area 2 and 2,300 cubic yards from Area 3 will be dredged. The proposal includes ocean disposal of all 11,400 cubic yards of dredged material, as well as for the dredged material from subsequently required maintenance dredging over the life of the permit.

The purpose of this activity is to restore navigable depths at existing Barge Piers A and B in order to continue safe marine transfer operations at the piers and to properly dispose of the dredged material from this Arthur Kill location in conformance with ACOE and U.S. Environmental Protection Agency (EPA) requirements.

The physical composition of the dredge material can be characterized as a silty clay (approximately 4% sand, 65% silt and 31% clay). Physical, chemical and biological testing of Exxon's dredged material has been performed in accordance with ACOE, EPA and New Jersey Department of Environmental Protection and Energy (NJDEPE) requirements. The test results are presented in Appendix E of this application package. Based on these results, the composition of the dredge material is consistent with, and non-detrimental to, the existing physical, chemical and biological constituents of the Mud

Dump Site located in the Atlantic Ocean. Chemical analysis has determined this dredge material to be a non-hazardous waste suitable for ocean disposal.

The applicant has endeavored to find a suitable disposal site which would reuse or recycle the dredged material in a productive manner. The physical and chemical composition of the dredged material from the Exxon Bayway Refinery site does not conform to standard NJDEPE and New York Department of Environmental Conservation (NYDEC) requirements for utilization as landfill cover. The dredged material is also not suitable for fill or cover at other upland locations in the vicinity of the site due to the silty clay composition of the dredged material. Currently, Union County sends solid waste from this area to the AMS Transfer Station for out-of-state disposal. The upland area of Exxon's property cannot be utilized to dispose of the volume of material anticipated from the proposed dredging activity for deposition due to site utilization for existing extensive on-site petroleum and chemical processing facilities. Disposal alternatives are discussed in detail in Section 6.0 of this application. As detailed in this document, through careful consideration of the practical and feasible alternatives for disposal of the proposed dredged material from the necessary Exxon maintenance dredging activities, ocean disposal has been selected as the preferred disposal method.

The applicant received a Waterfront Development Permit (WDP) and Water Quality Certification (WQC) from the NJDEPE on February 14, 1991 which authorized the dredging of the Barge Piers A & B area with ocean disposal. The permit states that the proposed maintenance project is in compliance with the New Jersey Coastal Zone Management program. The WDP and WQC expires on February 14, 1996.

3.0 APPLICATION FORMS

EXXON

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

(33 CFR 325)

OMB APPROVAL NO. 0702-0036
Expires 30 June 1992

Public reporting burden for this collection of information is estimated to average 5 hours per response for the majority of cases, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Applications for larger or more complex projects, or those in ecologically sensitive areas, will take longer. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine, Protection, Research and Sanctuaries Act. These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application *(see sample drawings and instructions)* and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

1. APPLICATION NUMBER *(To be assigned by Corps)*

2. NAME AND ADDRESS OF APPLICANT
Exxon Company, U.S.A.
P.O. Box 222
1400 Park Avenue
Linden, New Jersey 07036-0222
Telephone no. during business hours
A/C ( ) _____ (Residence)
A/C (908) 474-7293 (Office)

3. NAME, ADDRESS, AND TITLE OF AUTHORIZED AGENT
P. Steve Oliver, Senior Associate
Paulus, Sokolowski and Sartor, Inc.
67A Mountain Boulevard Extension
Warren, New Jersey 07059
Telephone no. during business hours
A/C ( ) _____ (Residence)
A/C (908) 560-9700 (Office)

Statement of Authorization: I hereby designate and authorize Paulus, Sokolowski and Sartor, Inc. to act in my behalf as my agent in the processing of this permit application and to furnish, upon request, supplemental information in support of the application.

SIGNATURE OF APPLICANT: *P. R. V.*
DATE: 6/2/92

4. DETAILED DESCRIPTION OF PROPOSED ACTIVITY

4a. ACTIVITY

This application requests Department of the Army authorization to maintenance dredge to an average depth of 25 feet below mean low water, with 2 feet of allowable overdredge, and initially remove approximately 11,400 cubic yards of material in Areas 1, 2 and 3 at Barge Piers A and B. The proposed maintenance dredging would be performed in the Arthur Kill at the Exxon Bayway Refinery located in Linden, Union County, New Jersey. All dredged material will be disposed of at the Mud Dump site in the Atlantic Ocean. Two additional maintenance dredging activities are anticipated over the life of the permit. The subject area has been historically dredged with ocean disposal.

4b. PURPOSE

To maintain navigable depths in Areas 1, 2 and 3 at Barge Piers A and B for the continued loading and unloading of petroleum products.

4c. DISCHARGE OF DREDGED OR FILL MATERIAL

Approximately 11,400 cubic yards of dredged material will be disposed of at the Mud Dump site in the Atlantic Ocean. Two additional maintenance dredging activities are anticipated over the life of the permit.

NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC., WHOSE PROPERTY ALSO ADJOINS THE WATERWAY

1. Mr. Mike Costic, Manager
PSE&G Linden Generating Station
Graselli Area
Foot of Wood Avenue South
Linden, NJ 07036

2. Mr. Frank Mueller
Joseph Cory Warehouse
666 South Front St.
Elizabeth, NJ 07202

3. Mr. John Regenghal
Phelps Dodge
Bayway Operations
720 South Front St.
Elizabeth, NJ 07202

WATERBODY AND LOCATION ON WATERBODY WHERE ACTIVITY EXISTS OR IS PROPOSED

Arthur Kill at Linden, Union County, NJ

7. LOCATION ON LAND WHERE ACTIVITY EXISTS OR IS PROPOSED

ADDRESS:

1400 Park Avenue
STREET, ROAD, ROUTE OR OTHER DESCRIPTIVE LOCATION

Union County | New Jersey | 07036-0222
COUNTY | STATE | ZIP CODE

City of Linden
LOCAL GOVERNING BODY WITH JURISDICTION OVERSITE

8. Is any portion of the activity for which authorization is sought now complete? ☐ YES ☒ NO
If answer is "yes" give reasons, month and year the activity was completed. Indicate the existing work on the drawings.

9. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, discharges or other activities described in this application.

ISSUING AGENCY	TYPE APPROVAL	IDENTIFICATION NO.	DATE OF APPLICATION	DATE OF APPROVAL	DATE OF DENIAL
New Jersey Department of Environmental Protection and Energy	Waterfront Development Permit and Water Quality Certificate	2009-90-0003.2		February 14, 1991	

10. Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
	6/2/92		5/26/92

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 3 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

U.S. GOVERNMENT PRINTING OFFICE: 1988 0—541-354

SUPPLEMENT TO ENG FORM-4345

Complete and submit, along with materials requested below and executed ENG Form-4345, "Application for a DA permit". If necessary, continue item on an additional sheet. Identify entry by item number.

GENERAL

1. Period of time required to complete the proposed work. Both actual work time and duration of the project are required (i.e., three weeks of work time over a two-month period). Two weeks over a one month period.

2. Information characteristic of neighborhood (i.e., high, medium, or low density; residential, commercial, or industrial).

   High Density, Industrial

3. Types of adjacent marine structures and approximate distance from the project site.

   Saltwater Pumping Station and associated dolphins - approximately 300 feet north.

4. Distance to noise sensitive areas (i.e., schools, hospitals, etc).

   St. Elizabeth Hospital - 1.8 miles
   Alexian Brothers Hospital - 1.8 miles
   Elizabeth General Center - 2.0 miles

Types of construction equipment to be used during construction and number of each type (i.e., bulldozers, trucks, cranes, etc).

Clamshell bucket and barge scow.

6. Submit representative photographs, color if possible, of the project area. Identify pictures (i.e., view from north, east, etc., time and date taken). Outline the location of the proposed work on the photograph. See Appendix D

7. Indicate on your project plans and on photographs of the site(s) the location of any wetlands vegetation (such as cordgrass, reedgrass and cattails) in the construction area. Identify photographs as indicated in box 6. N/A

8. Indicate the location of any known historical or archaeological site(s) within the project limits.

   None Known

9. Submit copy of any completed environmental studies or reports on the proposed project. See Appendix E - Dredge Material Analysis

10. Discuss alternatives to the proposed project which were investigated including alternative locations, disposal areas, construction techniques etc. and why they were rejected.

    See Section 6.0 of the enclosed application.

DREDGING - UPLAND DISPOSAL

11. Submit specific locations and photographs, color if possible, of the proposed site(s) for the deposition of dredged material. Identify all photographs as indicated in box 6. N/A

12. Describe the present land use of the disposal site(s).

N/A

13. Indicate physical nature of dredged material (i.e., sand, silt, clay etc). Give percentages of the various fractions, if available.

N/A

14. For maintenance dredging, DA permits are generally issued for a 10 year period. Indicate the number of times dredging is anticipated over a 10 year period and the total capacity (cubic yards) of the proposed disposal site(s) which will be used to accommodate the dredged material.

N/A

15. Describe method of dredged material containment (i.e., embankment, bulkhead, etc).

N/A

DREDGING - OPEN WATER DISPOSAL (OCEAN)

16. For maintenance dredging, DA Permits are generally issued for a 3 year period. Indicate the number of times dredging is anticipated over a 3 year period. Two

17. Submit required testing data (testing criteria will be furnished upon request). See Appendix E

8. Discuss alternatives to open water disposal of dredged material and why they were rejected.

See Section 6.0

MOORING FACILITIES

19. Number of water craft using the present marina facility. Are pumpout facilities available? N/A, no pumpout facilities.

20. Number and type of water craft which will utilize the proposed marina or docking facility. Will pumpout facilities be provided for?
Barges, no pumpout facilites.

LAND FILL

21. Indicate type of structures to be built on the proposed fill. N/A

22. Type of fill to be used (i.e., sand, stone, rubble, earth, etc). N/A

23. Method of fill placement.

N/A

24. Describe any proposed methods for controlling turbidity during filling operation.

N/A

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
26 FEDERAL PLAZA
NEW YORK, N. Y. 10278-0090

REPLY TO
ATTENTION OF:

July 1, 1986

Western Permits Section

SUBJECT: "Consistency Certification" with the New Jersey State Coastal Zone Management Program

Dear Applicant:

Federal regulations require that applicants for Department of the Army permits to commence activities or work in navigable waters or other waters of the United States, which fall under the jurisdiction of a State with a Coastal Zone Management (CZM) program approved by the Secretary of Commerce, must provide consistency certification. A certification statement must accompany an application for a Department of the Army permit from the New York District, Corps of Engineers.

On 29 September 1978, the CZM program for the State of New Jersey was approved by the Department of Commerce. Therefore, all applications for Department of the Army permits for work in the designated Coastal Zone of New Jersey must contain a consistency statement.

CERTIFICATION

The applicant must certify that the proposed activity is consistent with the state's CZM Program. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this section.

"The proposed activity complies with and will be conducted in a manner that is consistent with the New Jersey State Coastal Zone Management Program."

[signature] 6/1/92

Signature of Applicant Date

Additional information concerning the approved Coastal Zone Management Program can be obtained by contacting:

New Jersey Department Of Environmental Protection
Division of Coastal Resources
P.O. Box 1889
Trenton, New Jersey 08625
Telephone Number: (609) 292-0060

Processing of Department of the Army permit applications will be held in abeyance until such time that consistency certification is received.

Richard L. Tomer

Richard L. Tomer
Chief, Western Permits Section

4.0 PROJECT DESCRIPTION

EXXON

4.0 PROJECT DESCRIPTION

4.1 Proposed Activities Requiring Department of the Army Authorization

Exxon requests Department of the Army authorization to perform maintenance dredging at Barge Piers A & B in the Arthur Kill at the Exxon Bayway Refinery located in Linden, Union County, New Jersey and dispose of the dredged material through ocean disposal (see Project Drawings in Appendix C - Sheets 1 and 2 of 4). The purpose of this activity is to restore navigable depths in Areas 1, 2 and 3 at Barge Piers A and B to ensure continued safe marine transfer operations at the site.

Presently, the water area is heavily silted around Barge Piers A and B (see Project Drawings in Appendix C - Sheet 3 of 4). In order to deliver petroleum products, Exxon is required to unload oil cargo from tankers at sea to barges. The barges then moor at Barge Piers A and B to unload the product. With the current silted conditions at the Barge Piers, the barges can only moor at the extreme ends of the piers. In addition, the barges can only be loaded to less than half their capacity in order to be able to moor at the piers. This limits the amount of petroleum products that can be loaded/unloaded at any one time and also increases the amount of barge traffic within the Arthur Kill, which is a heavily congested area. In addition to the increase in barge traffic, there is also an associated increase in the number of oil transfers, which adds to the risk of an oil spill incident in the harbor.

Exxon proposes to dredge to an average depth of 25 feet below mean low water, with two feet of allowable overdredge (see Project Drawings in Appendix C, Sheet 4 of 4). Based on October 1991 soundings, Exxon will remove approximately 3,100 cubic yards of dredged material from Area 1, 6,000 cubic yards from Area 2 and 2,300 cubic yards from Area 3 for an initial total of 11,400 cubic yards of dredged material. As necessary, Exxon will dredge over the 3 year life of the permit to maintain the proposed

project depth to ensure navigability. The dredging activity will employ precision techniques of a clam shell dredge and a scow barge. It is anticipated that Exxon will dredge at least two additional times during the three year maintenance dredging period. The dredged material will be disposed of at the ocean disposal site (Mud Dump) in the New York Bight. All additional maintenance dredged material is also proposed for ocean disposal, although subject to review under the Ocean Dumping Criteria for each future maintenance dredging activity.

Based on the Alternative Analysis presented in Section 6.0 of this application, it has been determined that it is not feasible to dispose of the dredged material at an upland, non-wetland location. The primary limiting factor against upland disposal is the lack of available land for the purpose of disposal of dredged material. The applicant's own upland site was discounted due to the extensive on-site chemical and oil processing facilities. The high cost of available land within the project vicinity also precluded an economically feasible upland, off-site disposal location. Ocean disposal of the dredged material at the Mud Dump Site has been identified as the preferred alternative as it is practicable, within reasonable cost and current technology, and has the least potential impact to the environment.

Historically, depths around Barge Piers A & B have been maintained within navigable limits through maintenance dredging activities approved by the ACOE and NJDEPE. Permits were issued by the ACOE in 1974 and again in 1983 which authorized maintenance dredging of Barge Piers A & B with ocean disposal of the dredged materials. Exxon was issued NJDEPE WDP and WQC No. 2009-90-0003.2 on February 14, 1991 for the proposed dredging and disposal activities requested in this application.

4.2 Proposed Procedure for Ocean Disposal Operation

The proposed ocean disposal of the dredged material would be conducted at the Mud Dump Site and would comply with all ACOE and U.S. Coast Guard regulations, as well as the standard conditions stipulated by the ACOE. Dumping activities will be carried out in conformity with relevant EPA regulations.

The applicant will comply fully with the requirements set forth regarding notification procedures prior and subsequent to dumping related activities. This will include providing any information deemed necessary to the applicable authorities. No dumping activities will transpire in violation of such regulations or without necessary authorization. All other required administrative tasks, such as proper record keeping and submission of such records, will also be carried out by the applicant. In addition, the provision of proper notifications, access and cooperation will be provided regarding any required inspections or compliance enforcement measures.

The applicant will follow the specific conditions set forth in any issued ACOE permit regarding the actual disposal of the dredged material. This applies to all aspects of the dredging activities including vessel departure and arrival times, vessel construction and certification requirements, and all other disposal procedures.

5.0 ENVIRONMENTAL ASSESSMENT

EXXON

5.0 ENVIRONMENTAL ASSESSMENT

5.1 Introduction

In assessing the environmental impacts which may result from ocean disposal of Exxon's dredged material, consideration must be given to Section 103 of the Marine Protection, Research and Sanctuaries Act (transfer of dredged material for ocean disposal). Compliance with these regulations must be achieved in order to transport and ocean dispose of dredged material within waters of the United States. These criteria are set forth in 40 CFR Parts 220-229. The specific conditions which need to be met are as follows:

A. An examination of alternative methods of dredged material disposal must find no other practicable option method which would result in less adverse environmental impacts (See Section 6.0). The term "practicable" is defined as "available and capable of being done, after taking into consideration cost, existing technology and logistics in light of overall project purposes and needs";

B. Disposal of the dredged materials must not result in a violation of established EPA and ACOE water quality criteria or threaten the existence of endangered plant or animal species in the area;

C. Disposal of the dredged materials must not result in a degradation of United States waters, in terms of pollutant effects on human health and welfare, on aquatic biota, on aquatic ecosystem productivity and on recreational, aesthetic and economic values and other uses of the ocean; and

D. The proposed operation for disposal of dredged materials must seek to minimize potential adverse environmental effects.

As demonstrated in the following sections, the proposed dredging and ocean disposal of Exxon's dredged materials will comply with the criteria set forth in the Marine Protection, Research and Sanctuaries Act, as well as the NJDEPE rules on Coastal Zone Management and the Water Quality Certification Program.

5.2 Physical and Chemical Tests Performed

All dredged material proposed for ocean disposal under an ACOE permit and NJDEPE's water quality certificate must undergo environmental testing based on guidance from the regulatory agencies (see the ACOE/EPA publication entitled "Guidance for Performing Tests on Dredged Material to be Disposed of in Ocean Water," dated December 21, 1984 and the NJDEPE draft publication entitled "Guidance Document for Applicants Required to Perform Dredge Spoil Analysis for Water Quality Certification (WQC) in New Jersey; undated). This testing analyzes the physical, chemical and biological properties of the dredged material. The ACOE and NJDEPE previously advised the applicant as to the location and type of testing required. The testing was performed in accordance with ACOE requirements specifically provided for this proposed project, as noted in the ACOE's December 9, 1991 correspondence, as well as analyses required for a NJDEPE WQC. The specific ACOE required analyses that were performed are as follows:

- o Physical - Physical testing was performed to determine the compatibility of the dredged material with the existing disposal environment. The physical characteristics also bear upon how the dredged materials is expected to assimilate into the aquatic environment after disposal. Specific testing in this area included:
  - Grain size (percent of sand, silt and clay) - Grain size distribution is defined by the following criteria:
    Sand - > or = to 0.0625 mm.
    Silt - < 0.0625 but > 0.0039 mm.
    Clay - < 0.0039 mm.
- o Chemical/Elutriate - A chemical analysis of the site water and liquid phase elutriate from the dredge materials was completed. The elutriate analysis measured the potential for the release of contaminants into the water column. From this testing, acceptability of potential impacts were evaluated. These tests were conducted for:
  - Petroleum Hydrocarbons
  - PCBs
  - Mercury

presented in Appendix E. Based upon these results, compliance with the regulations regarding chemical composition of dredged sediment for ocean disposal has been met by the applicant.

5.3 Statement of Environmental Compliance

Both the composition of the material to be dredged and the manner in which the operation will be carried out for this Exxon maintenance dredging project will comply with the Federal regulations governing such actions. Supporting documentation regarding compliance is presented herein and in the analysis of the dredged material testing. Results of physical, chemical and biological testing are presented in Appendix E of this application for Federal review of the acceptability for disposal at the Mud Dump Site.

In terms of physical composition, Exxon's dredged materials consist primarily of a silty clay sediment composed, on average, of approximately 4% sand, 65% silt and 31% clay (Table 1). This composition is compatible with the disposal environment, as the Mud Dump Site also contains a large volume of such material. Since the Mud Dump also contains similar soil material to the physical composition of the proposed dredged material, minimum impacts can be expected.

One minor potential impact may be a short-term incidence of suspended particulates in the immediate disposal area. This short-term suspension would be due to the fine-grained portion (silts and clays) of the dredged material, which would prevent it from sinking down to the bottom as quickly as the heavier materials (sands) would. However, the moisture content and dumping procedures proposed are expected to assure that the dredged material remains cohesive. The physical substrate of the Mud Dump Site is not expected to be altered by the addition of this material.

Analysis of the biological and chemical test results performed on Exxon's dredged material determined that the material would not have a significant adverse impact upon

the Mud Dump Site area (See Tables 2 through 11). The dredged material has been shown to be both organic and non-hazardous. Therefore, disposal of the dredged material is not expected to introduce unacceptable levels of contaminants into the disposal environment. The potential impact to the Mud Dump, which may be anticipated, would be a short-term roiling of settled dredged material due to disposal. Direct contamination resulting from Exxon's dredged material itself, however, is not expected to occur.

The structure and function of the Mud Dump ecosystem and related aquatic organisms will not be altered or adversely impacted by Exxon's dredged material. The chemical and physical composition of the dredged material is acceptable under regulations governing threatened or endangered species. Effects of disposal would essentially be confined to minor temporary changes resulting from the initial discharge of dredged materials. This would not be expected to create or contribute significantly to long term hazards for organisms in the aquatic ecosystem.

Based on the criteria promulgated pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act enumerated previously in Section 5.1, significant adverse environmental impacts are not anticipated as a result of ocean disposal of Exxon's dredged material. The disposal of Exxon's dredged material, which is similar to on-going dredging and disposal activities throughout the Arthur Kill Region, can be expected to successfully assimilate to the Mud Dump Site environment without significant harmful effects. In addition, the applicant will also minimize disposal impacts by utilizing all practical measures. Full compliance with pertinent federal guidelines and adherence to the procedures outlined will be met.

TABLE 1 GRAIN SIZE ANALYSIS			
	Area 1	**Area 2**	**Area 3**
Sand	4.0%	2.6%	3.8%
Clay	30.2%	32.6%	31.8%
Silt	65.7%	64.8%	64.4%
Source: NYTEST Environmental, Inc. (See Appendix E)			

TABLE 2

AREA 1
LIQUID PHASE CHEMICAL ANALYSIS RESULTS (ppb)

Constituents	D.L.	Elutriate	Site Water
Mercury	(0.2)	ND	ND
Cadmium	(0.1)	ND	ND
PCB	(0.1)	ND	ND
Petroleum hydrocarbons	(50.0)	ND	ND
DDT	(0.05)	ND	ND

ppb - parts per billion
D.L. - Detection Limits
N.D. - Not Detected at the Detection Limit
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 3

AREA 1
BODY BURDEN LEVELS (ppm) IN TEST SPECIES

Constituents	(D.L.)	Palaemonetes pugio	Nereis virens	Mercenaria mercenaria
Mercury	(0.20)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Cadmium	(0.25)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
PCB	(0.04)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Petroleum hydrocarbons	(0.10)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
DDT	(0.02)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)

ppm - parts per million
D.L. - Detection Limits
N.D. - Not detected at the Detection Limit (Test)
(N.D). - Not detected at the Detection Limit (Reference)
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 4

AREA 1
BIOASSAY RESULTS

Suspended Particulate Phase (96 hours test)

	50 (critical)
Acartia tonsa	23.63%
Mysidopsis bahia	47.51%
Menidia beryllina	69.08%

Solid Phase (10 days)

	% Survival in reference	% Survival in test	Difference (Reference-Test)
Palaemonetes pugio	96.4	93.8	2.6
Mercenaria mercenaria	100.0	99	1.0
Nereis virens	99	92	7
TOTAL COMMUNITY	98.5	94.9	3.6

LC 50-Lethal Concentration resulting in 50% mortality
LPC-Limiting Permissible Concentration (0.01 times the critical LC 50)
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 5

AREA 2
LIQUID PHASE CHEMICAL ANALYSIS RESULTS (ppb)

Constituents	D.L.	Elutriate	Site Water
Mercury	(0.2)	ND	ND
Cadmium	(0.1)	ND	ND
PCB	(0.1)	ND	ND
Petroleum hydrocarbons	(50.0)	ND	ND
DDT	(0.05)	ND	ND

ppb - parts per billion
D.L. - Detection Limits
N.D. - Not Detected at the Detection Limit
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 6

AREA 2
BODY BURDEN LEVELS (ppm) IN TEST SPECIES

Constituents	(D.L.)	Palaemonetes pugio	Nereis virens	Mercenaria mercenaria
Mercury	(0.20)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Cadmium	(0.25)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
PCB	(0.04)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Petroleum hydrocarbons	(0.10)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
DDT	(0.02)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)

ppm - parts per million
D.L. - Detection Limits
N.D. - Not detected at the Detection Limit (Test)
(N.D.) - Not detected at the Detection Limit (Reference)
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 7

AREA 2
BIOASSAY RESULTS

Suspended Particulate Phase (96 hours test)

	50 (critical)
Acartia tonsa	42.01%
Mysidopsis bahia	70.71%
Menidia beryllina	65.33%

Soiled Phase (10 days)

	% Survival in reference	% Survival in test	Difference (Reference-Test)
Palaemonetes pugio	96.4	93.4	3.0
Mercenaria mercenaria	100.0	100	0.0
Nereis virens	99	93	6.0
TOTAL COMMUNITY	98.5	95.5	3.0

LC 50-Lethal Concentration resulting in 50% mortality
LPC-Limiting Permissible Concentration (0.01 times the critical LC 50)
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 8

AREA 3
LIQUID PHASE CHEMICAL ANALYSIS RESULTS (ppb)

Constituents	D.L.	Elutriate	Site Water
Mercury	(0.2)	ND	ND
Cadmium	(0.1)	ND	ND
PCB	(0.1)	ND	ND
Petroleum hydrocarbons	(50.0)	ND	ND
DDT	(0.05)	ND	ND

ppb - parts per billion
D.L. - Detection Limits
N.D. - Not Detected at the Detection Limit
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 9

AREA 3
BODY BURDEN LEVELS (ppm) IN TEST SPECIES

Constituents	(D.L.)	Palaemonetes pugio	Nereis virens	Mercenaria mercenaria
Mercury	(0.20)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Cadmium	(0.25)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
PCB	(0.04)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
Petroleum hydrocarbons	(0.10)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)
DDT	(0.02)	N.D. (N.D.)	N.D. (N.D.)	N.D. (N.D.)

ppm - parts per million
D.L. - Detection Limits
N.D. - Not detected at the Detection Limit (Test)
(N.D.) - Not detected at the Detection Limit (Reference)
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 10

AREA 3
BIOASSAY RESULTS

Suspended Particulate Phase (96 hours test)

	50 (critical)
Acartia tonsa	15.62%
Mysidopsis bahia	33.27%
Menidia beryllina	19.49%

Soiled Phase (10 days)

	% Survival in reference	% Survival in test	Difference (Reference-Test)
Palaemonetes pugio	96.4	94.0	2.4
Mercenaria mercenaria	100.0	100.0	0.0
Nereis virens	99	93	6
TOTAL COMMUNITY	98.5	95.7	2.8

LC 50-Lethal Concentration resulting in 50% mortality
LPC-Limiting Permissible Concentration (0.01 times the critical LC 50)
Source: NYTEST Environmental, Inc. (See Appendix E)

TABLE 11

28 DAY DIOXIN RESULTS
BIOACCUMULATION RESULTS (pptr)*

	Reference	Test	Difference (Reference-Test)
Nereis virens			
Area 1	<1.00	4.66	3.66
Area 2	<1.00	4.84	3.84
Area 3	<1.00	3.32	2.32

*pptr - parts per trillion
Source: NYTEST Environmental, Inc. (See Appendix E)

6.0 ALTERNATIVES ANALYSIS

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6.0 ALTERNATIVES ANALYSIS

This section considers available disposal options for Exxon's dredged materials in accordance with Section 103 of the Marine Protection, Research and Sanctuaries Act. Each alternative was evaluated and subsequently compared to the other alternatives in order to identify the most feasible and environmentally acceptable disposal option. The screening criteria are first outlined, then followed by a list of potential options. A preliminary screening resulted in the immediate elimination of a number of options, as they proved to be not feasible. In a secondary screening process, the remaining options were examined in greater detail (See Appendix A). From this examination, the four best practicable alternatives were evaluated for final disposal selection. Through this process, ocean disposal was identified as the best practicable disposal alternative and the method that could be expected to have the least potential for adversely effecting the environment.

6.1 Disposal Method Evaluation Criteria

The initial criteria utilized to evaluate each possible alternative was derived from Disposal of Dredge Materials Within the New York District, prepared by the MITRE Corporation for the U.S. Army Corps of Engineers, New York District (ACOE:1987). The considerations set forth in this document allow the "reasonability" of each option to be evaluated in a variety of aspects. In examining the alternatives, it is critical to keep in mind the fact that disposal decisions are made on a case by case basis. The particular issues and/or concerns evident on a specific project determine which option is most reasonable, practical and feasible. Therefore, in evaluating each of the possible options the specific circumstances at the Exxon site were considered. By category, the criteria employed where appropriate were:

- Time to implement;
- Site stability; and
- Long-term maintenance and monitoring of the facility. -

2) Economic Considerations - reasonability and practicality of financial burden that the particular alternative would entail, including:

- Economic effect on use of ocean;
- Capital investment;
- Land cost; and
- Equipment needs.

3) Environmental Considerations - potential for negative environmental effects to result from implementation of the alternative, in terms of (where applicable):

- Environmental effect of the proposed dumping action;
- Substrate compatibility;
- Alteration of existing characteristics;
- Shellfish impacts;
- Impacts on aquatic resources; and
- Toxicity to marine, terrestrial or freshwater ecosystems.

4) Public Health and Welfare Considerations - potential for the particular alternative to place the public at the same kind of risk in terms of their health and/or welfare, examining:

- Effects on aesthetics and recreational use of the ocean;
- Effects on air quality;
- Effects on water quality (surface & groundwater);
- Proximity to public water supply; and
- Public health and safety.

- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401 et. seq.).

In order to identify the most desirable dredged material disposal option, a very broad range of alternatives required examination. The following is a list of those possibilities preliminarily screened for feasibility:

- No dredging
- Containerized ocean disposal
- Incineration
- Deep well injection
- Deep ocean disposal
- Offshore island containment
- Ocean spreading
- Filling mines
- Decontamination
- Production of construction materials
- Beach nourishment
- Selective dredging
- River/harbor disposal (open)
- Wetlands disposal (filling wetlands)
- Sanitary landfill cover
- Abandoned piers
- Subaqueous borrow pits
- Upland disposal, on-site
- Upland disposal, off-site
- Ocean disposal

6.2 Results of Preliminary Alternative Screening

Many of the alternatives listed in Section 6.1 have been eliminated from further consideration by the ACOE in their own review of available disposal options. Therefore, these same alternatives were discounted from a more detailed screening, as there would

This option was determined neither practical nor reasonable. If the no-action alternative is exercised, it would not allow the Exxon Bayway Refinery to continue to function as a marine terminal facility. The petroleum barges can only be filled to less than half their capacity due to the existing shallow depths within the Barge Pier basin. Even with being filled to less than half their capacity, the barge mooring is limited to the outer/deeper portion of the Barge Pier basin due to the shallow, inaccessible depths closer to shore. The transfer of petroleum products from the tankers to the barges is currently a necessary operation. However, the increase in the number of individual transfer operations (more than twice as many) results in a commensurate increase in the chance of a spill occurring. There are clear and necessary operational and safety purposes for dredging at this location and therefore, the no dredging option was eliminated from consideration.

- Deep Ocean Disposal

  This alternative involves transporting the dredged material to a site farther offshore than the current Mud Dump Site. The costs for transportation and in obtaining certified disposal scows in taking the material out to the "deep ocean" would not be economically reasonable for a single applicant. The relatively small volume of Exxon's dredged material compared to the total volume of harbor sediment would not warrant the distance required for deep ocean disposal. In addition, the dredge material is considered suitable for disposal at the Mud Dump Site based on the enclosed laboratory analyses. Therefore, this option was eliminated from consideration.

- Off Shore Island Containment

  This alternative would entail the eventual creation of an island in deep water by depositing dredged material behind diked areas. The costs of this alternative would be considerable, both in terms of transportation and construction. Complications with this option involve long term planning requirements, navigation and safety concerns, costs and jurisdictional issues. This option is not considered feasible at this time.

environmental review and scrutiny. This method would also increase the area in which any adverse impacts associated with the ocean disposal option could potentially occur. There is little environmental advantage to this option, and for these reasons it was dismissed from further consideration.

- Containerized Ocean Disposal

This option involves the placing of the dredged material in containers for protection from the ocean environment. Problems with this option include excessive costs which would be involved with such an operation and the time consuming process of filling drums or other suitable containers. Further, this kind of undertaking is not warranted by the physical and chemical composition of the particular dredged material in question. Therefore, this option was excluded from further review.

- Decontamination

Process options for remediation of contaminated dredge material from the Exxon Bayway Refinery site were screened on the basis of development, availability, effectiveness, implementability and costs. There are many possible combinations of process options that can be incorporated into a remedial action plan. Unfortunately, few of these processes have been applied to contaminated dredge material on a full scale, and none of these processes have been applied to dredged material from the New York District ACOE. Most testing of the available treatment technology process options for contaminated dredged material have only been performed on a bench scale, with limited pilot-scale applications. In addition to the lack of available decontamination technology, a suitable upland, non-wetland, location for the required dewatering of the dredged material prior to treatment has not be found. For these reasons, this alternative was not considered feasible.

economic cost in truck and/or railroad transportation to these mines discounted this option from further consideration.

- Production of Construction Materials

This alternative involves processing the dredged material into a suitable form and then using it to create new building materials. Currently, the primary problem associated with this option is the lack of research as to the suitability of dredged material for this use and whether a market exists for its use. Also, due to the salt content of the dredged material, desalinization would be required before the material could be used in construction materials such as concrete. For these reasons, this alternative was not considered feasible.

- Incineration

Incineration would require the combustion of dredged materials at a suitable existing facility, the construction of a facility on-site, or transport of a portable incinerator to the site. This alternative cannot be seen as a possible option because of financial, environmental, public health and welfare considerations. Additionally, a special permit from the NJDEPE, involving a time consuming review process, would be required for combustion of dredged materials. Chief environmental concerns are those of air emissions and remnant ash disposal. Provision for a suitable disposal site for remnant ash would also be required. The incinerator would also not reduce the volume of dredged material to a significant degree. Only organics would be removed and the resulting material would have a higher concentration of contaminants. In addition, a great amount of fuel would be expended to incinerate the dredged material. There would be very little material within the dredged material itself that could fuel the incineration process. Therefore, incineration was not considered an appropriate disposal method for this dredged material.

- Abandoned Piers

This option involves disposing of the dredged material around abandoned piers. For the Exxon Bayway Refinery Waterfront project, this is not a feasible alternative since there is no location within the project area readily available for such use. This option was not considered further.

6.3 Secondary Screening and Results

After elimination of the aforementioned options, the remaining nine alternatives were examined in greater detail. The results of this secondary screening are outlined in Appendix A. All but four alternatives have been eliminated by this analysis. Discussion of the alternatives eliminated through this evaluation process follows:

A further examination of the four remaining options (use as sanitary landfill cover, upland disposal on-site, upland disposal off-site and ocean disposal at the Mud Dump Site) is supplied in Section 6.4.

- Beach Nourishment

  Beach nourishment would be an expensive, but attractive alternative for environmental reasons. Technically, this option is not feasible considering the composition of the dredged material from the Exxon Bayway Waterfront Refinery site. In order for dredged material to be usable as beach nourishment, it must be made up of at least 85% sand. Exxon's dredged material however, is on average, approximately 4% sand. Therefore, regulatory concerns prohibit use of this material for beach nourishment.

- Selective Dredging

  Selective dredging is disregarded for reasons similar to the No Dredging Alternative. Therefore, no further analysis of this alternative is warranted.

- River/Harbor Disposal

  Regulatory factors make the River/Harbor disposal alternative infeasible. The disposal of dredged materials in river/harbor sites has the potential to impact navigation and aquatic habitats. Regulatory prohibitions on this alternative are based on a high probability of negative environmental and navigational impacts. Therefore, such disposal is not feasible.

- Wetlands Disposal (Filling Wetlands)

  Implementation of this alternative would entail disposal of the dredged material in wetlands, which are considered a special aquatic site. This option also must be discounted due to regulatory restrictions. Both Federal and State regulations protect wetland areas from such undertakings as this environmental resource would be subject to damage from such disposal activities. Recognition is given to the fact that wetlands are particularly sensitive areas, and thus must be treated in an appropriate manner. Other problems with this option would include high financial costs and the unlikely availability of sufficient wetland areas for this purpose. Existing Federal and State regulations are the key element in removing this option from further consideration.

- Subaqueous Borrow Pits

  Implementation of this option would require the filling of already existing borrow pits in bay areas (such as Sandy Hook Bay, Raritan Bay and Newark Bay) with dredged material from the Exxon project. Upon closer examination, this option is also not considered feasible. Problems surface in terms of high costs, possible alterations of bottom surface, potential sediment movement out of the pits, the need to locate a large volume of clean material to cap the dredged material and local environmental opposition to such an alternative. The ACOE had identified borrow pits within the above mentioned areas as possible disposal sites as long as ten years ago, but opposition to this alternative continues and use of borrow pits for dredged material disposal has not been ratified by the ACOE. All of these factors combine to eliminate this option from further consideration.

6.4 Disposal Options Considered in Detail

A detailed examination of the four most feasible and reasonable disposal options is required in order to identify the preferred disposal method for dredged material from the Exxon Bayway Refinery waterfront site. The four disposal options are: 1) Sanitary

Landfill Cover; 2) Upland Disposal, on-site; 3) Upland Disposal, off-site; and 4) Ocean Disposal at the Mud Dump Site.

6.4.1 Sanitary Landfill Cover

Use of dredged material from the Exxon Bayway Refinery waterfront site has been examined utilizing criteria from published reports prepared for similar disposal operations reviewed by the ACOE, New York District (ACOE: 1980, 1987). The basic tenants of the evaluation for suitability for disposal as landfill cover requires: first, the review for a suitable site; second, whether the material is itself suitable for landfill cover; and third, the cost and practicality of landfill cover technology.

6.4.1.1 Suitability of Sediment for Landfill Cover

Physical Characteristics - The physical composition of this dredged material is similar to many sites along Newark Bay, the Arthur Kill and the Kill Van Kull in that the dredged material is a silty clay mix, on average approximately 4% sand, 65% silt and 31% clay. The organic nature of this soil also increases the tendency for high moisture content. Soil samples of the dredged material indicate an average moisture content in excess of 70%. The high moisture content of this dredged material would necessitate long-term, costly de-watering procedures. The dredged material may also exhibit renewed re-wetting problems. In dry periods, the silt and clay content could present dust problems which may require special planting for stabilization or maintenance precautions. A related factor to be considered in the utilization of dredged material from tidal water bodies is the need to reduce the salt content of the material which is a considerable alteration to its existing composition. A further consideration is the potential for odorous conditions. Lastly, the high water content of this dredged material would require dewatering prior to deposition as landfill cover and would therefore necessitate the identification of a practicable upland location for de-watering to take place.

Environmental Characteristics - The use of this dredged material from the Arthur Kill as landfill cover cannot be considered "clean fill" suitable for landfill cover, due to the presence of chemical constituents. Although considered non-hazardous, the dredged material cannot be employed in the same manner as clean fill. Dredge sediment is defined as a regulated solid waste material in accordance with the NJDEPE Division of Solid Waste Management Criteria (N.J.A.C. 7:26-1.4) for acceptable cover material.

6.4.1.2 Site Suitability

Identification of a suitable landfill in New Jersey with the potential to utilize Exxon's dredged material is limited due to NJDEPE guidelines. The Staten Island Landfill was contacted to determine if the dredged material would be acceptable as a landfill cover in New York State. Mr. Richard Barzon of the Staten Island Landfill stated that straight untreated material is unlikely to be accepted due to NJDEPE and NYDEC solid waste management regulations. Regardless, the NYDEC will not accept solid waste from New Jersey. Other considerations are whether the material contains hazardous constituents, the potential impact to groundwater, grain size and the dryness of the material.

Conclusion - Exxon's dredged material is not suitable for sanitary landfill cover due to its physical and chemical composition and the prohibitions of current NJDEPE and NYDEC regulations. Currently, there is no landfill designated to receive this solid waste material. In addition, prior to deposition at a landfill site (if one was available), an extensive dewatering program at an upland location other than the landfill site would need to be implemented, increasing both the financial expense and the practicality of this alternative.

6.4.2 Upland Disposal-Off-Site

Upland disposal is defined as the disposal of dredged material in a confined area on the land. This activity requires identification of an acceptable upland location, as well as consideration of the suitability of Exxon's dredged material for this type of disposal method. Environmental and public interest considerations are a factor in the determination of this alternative as viable.

According to the ACOE publication, "Dredged Material Disposal Alternatives, Port of New York and New Jersey", all land suitable for residential or industrial use should be eliminated from consideration. New York and New Jersey have also eliminated agricultural land and wetlands as suitable for dredge disposal. The ACOE will consider "barren areas with little vegetation that are not developed in any way" for off-site upland disposal of dredged material.

Upland disposal at an off-site location would require a commitment of land use for disposal purposes, at least until disposal and dewatering processes have been completed. The construction of a containment area and continued maintenance and monitoring of the site would also be required. This commitment of land would most likely demand direct acquisition of land or use of public-owned land.

The procurement of a large tract of barren land, a suitable distance from potentially impacted residential communities, but within the one mile radius deemed proximate to the Exxon Bayway Refinery Waterfront is not feasible due to the highly urbanized and industrial character of this region (see Appendix B). The one mile radius from the project site is utilized as an approximate measure of potential upland disposal sites that would be technically and economically feasible for transport.

The possibility of public demand for silty clay soils within future recreation areas was discounted due to the salt content of the sediment and the difficulty in establishing

landscaped vegetation after long-term disposal procedures have been completed. In addition, non-hazardous but undesirable constituents in very low concentrations in the sediment, such as dioxin, although common in Arthur Kill and Newark Bay sediment, is not readily acceptable to an upland site due to potential human contact with the material, phytotoxicity and groundwater contamination. This long-term demand for open space would compete with recreational needs of highly populated Union and Staten Island Counties, which are presently under-served for open space and recreation.

Other potential community impacts include objectional odors due to liberation of gases from the organic content of the dredged material. The potential for long-term construction-related impacts is also a factor. The alteration of site topography, drainage and existing site vegetation are significant impacts inherent in this alternative.

In order to determine the cost and availability of land within approximately one mile of the project site, PS&S contacted Mr. Mark Kasson of Sterling Properties, a commercial realtor operating in Linden. Mr. Kasson stated that the cost of available parcels within the Linden and Elizabeth area averages between $300,000 to $500,000 per acre for non-waterfront parcels.

Besides the high cost of acquiring these parcels, there would be added expenses to either pump the dredged material through large pipes along the existing streets to the upland parcel (a difficult and expensive engineering task due to the existing surrounding residential neighborhoods and commercial properties) or else transport the dredged material in tightly sealed trucks in a semi-fluid state through the same neighborhood streets. Authorization from the town would be required for the placement of large pipes along the town's street, which would be a hinderance to traffic flow within a densely populated area. In addition, if a site could be found that is zoned appropriately for the proposed activity, the logistics of drying the material, truck dumping fees, upland disposal approvals and mixing in clean fill to make the dredged material suitable for other construction uses would increase the projected cost of the project beyond the point that

would make the project economically feasible. The cost of acquiring an acre of land in this urban area is economically and physically impossible. Therefore, the cost of upland disposal dismissed this option as unreasonable as well as not practicable or feasible.

6.4.3 Upland Disposal-On-Site

The existing uplands at the Exxon Bayway Refinery site consist of approximately 1,200 acres. The property is used extensively for ongoing refinery operations. On-site structures include existing buildings, storage tanks, piping, etc. which are currently undergoing improvement associated with the redevelopment of the Bayway Refinery. In addition, there are also Federal and State environmentally regulated areas that restrict the use of the on-site uplands as a practicable disposal alternative. These environmentally regulated areas include wetlands with their associated State transition areas, Morses Creek and it's associated floodplain, NJDEPE Waterfront Development Zone restrictions, ongoing site remediation activities and current NJDEPE investigations into other potentially contaminated areas that may require remediation.

Since the drying and storage of the dredged material on-site is not possible due to area limitations, it would become necessary to transport dredged material by truck in a semi-fluid state to an available disposal site. If such a site could be found (see previous section) the logistics of the associated constraints such as drying the material, trucking dumping fees and upland disposal would increase the projected cost of the project beyond the point that would make the project economically feasible.

6.4.4 Ocean Disposal Option

Review of the ACOE's previous evaluations, as documented in past permit decisions, indicates that the ocean disposal alternative is the most feasible and practicable alternative for the Exxon Bayway Refinery dredged material. Ocean disposal would entail transporting the dredged material from the Exxon Waterfront site to the Mud Dump Site and then discharging it in accordance with federal guidelines. Due to the nature of both the dredged material and the Mud Dump Site itself, this operation would not be expected to result in significant environmental impacts.

The Mud Dump Site is located in the New York Bight approximately 5.3 miles from the New Jersey Shore and 9.6 miles from the Long Island Shore. Its exact coordinates are:

LATITUDE	LONGITUDE
40 23' 48" N	73 51' 28" W
40 23' 48" N	73 50' 00" W
40 21' 48" N	73 51' 28" W
40 21' 48" N	73 50' 00" W

The area directly outside of the Mud Dump Site is not seen as being significantly affected by the disposal operation as the materials have been shown to not move substantial distances following their disposal. Physically, the bottom topography of the Mud Dump Site has been vastly altered by the large amount of disposal activities which have been taking place since 1914.

Physical impacts upon the Mud Dump Site resulting from disposal of Exxon's dredged materials are expected to be short-term, without any long-term adverse effects. A further modification of the local bottom topography may result from accumulation of the project dredged materials with other permitted disposal activities. The new materials

are not expected to alter the sediment type. Exxon's dredged material has a similar composition to that of the Mud Dump Site. There is a small potential for short-term, localized resuspension of particulates in the Mud Dump Site Waters during disposal operations.

There may be a short-term, minor degradation of localized water quality at the site. Testing of the dredged material has determined the material to be non-hazardous and in conformance with the criteria for ocean disposal of dredged material pursuant to the Marine Protection, Research and Sanctuaries Act. Therefore, ocean disposal of dredged material should not introduce potentially hazardous chemical elements into the Mud Dump Site environment.

Exxon's dredged material is not expected to have a significantly negative impact on the biological conditions at the Mud Dump Site. The actual disposal operation may result in some physical burial of benthic organisms and a temporary habitat alteration during settling. Due to the historic use of the Mud Dump Site for disposal of like materials, the marine life in the area is largely pollution-tolerant. Marine life outside the Mud Dump Site itself would not be expected to experience significant adverse effects, as sediment deposition is localized and the existing sediments in the Mud Dump Site have been shown to not move out of the immediate area. Therefore, the potential impact to aquatic resources primarily concerns temporary environmental alteration and benthic burial.

Conclusion

Ocean disposal is the preferred disposal alternative for the Exxon Bayway Refinery's dredged material. The evaluation criteria detailed in this document illustrate ocean disposal as the most feasible and practicable alternative, while having the least potential adverse environmental effect.

6.5 Bibliography

Disposal of Dredged Material Within the New York District, (Virginia: The MITRE Corporation for the U.S. Army Corps of Engineers, New York District), May 1979.

Dredged Material Disposal Alternatives - Port of New York and New Jersey, (U.S. Army Corps of Engineers, New York District), May 1983.

Feasibility Study For Use of Dredged Material From NY/NJ Harbor as Sanitary Landfill Cover, (Malcolm Pirnie for New York District Corps of Engineers), October 1987.

Federal Register: Guidelines for Specification of Disposal Sites for Dredged or Fill Material, Part IV, (Environmental Protection Agency), December 24, 1980.

Planning Level Cost Estimates of Dredged Material Containment Islands in New York Harbor, (Mississippi: U.S. Army Corps of Engineers Waterway Experiment Station for the U.S. Army Corps of Engineers District, New York), May 1986.

Rules on Coastal Resources and Development, N.J.A.C. 7:7E-1.1 et. seq., (New Jersey Department of Environmental Protection - Division of Coastal Resources), February 3, 1986.

APPENDIX A -

ALTERNATIVE ANALYSIS MATRIX

EXXON

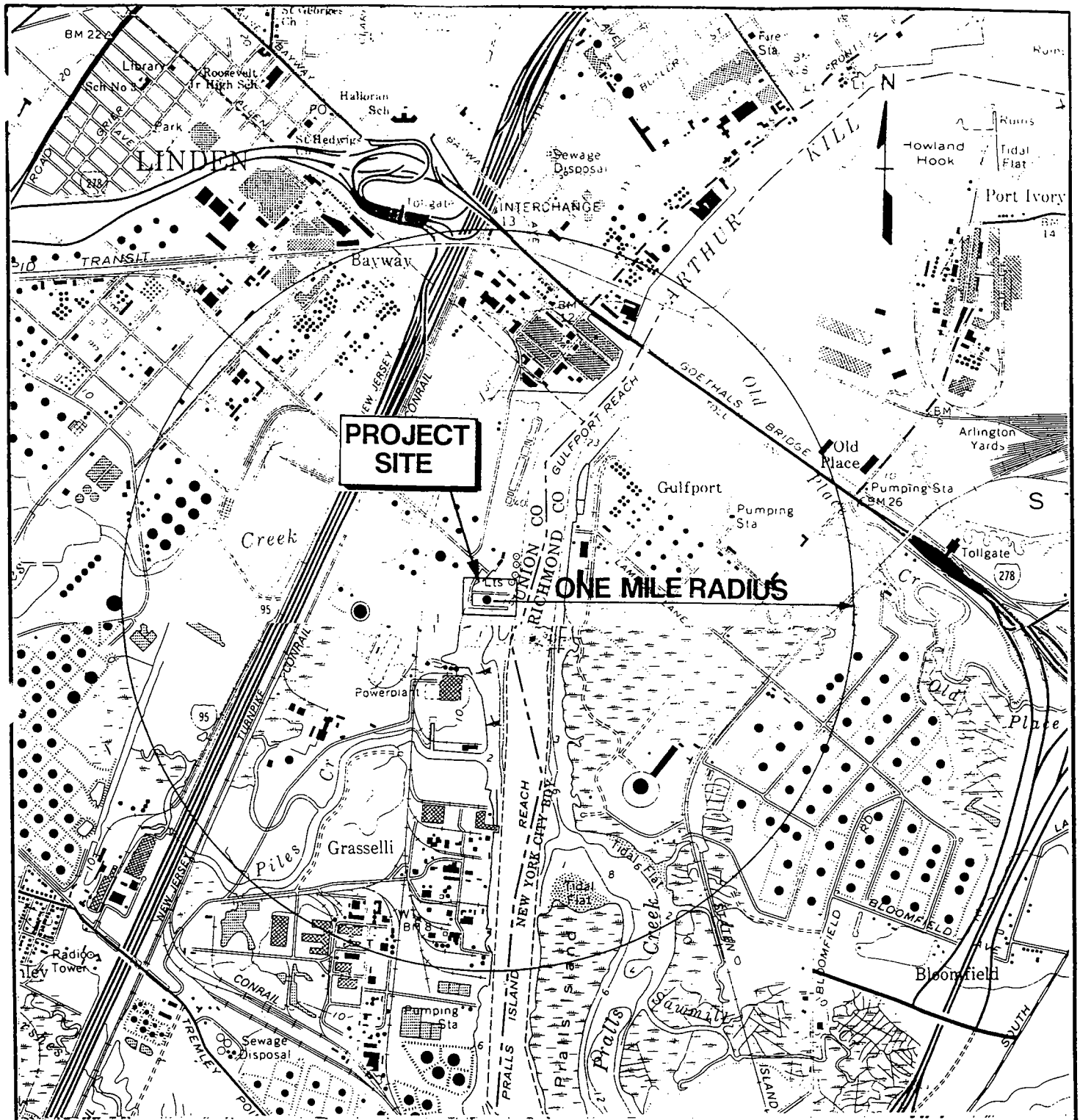
SEDIMENT DISPOSAL ALTERNATIVES ANALYSIS

AREA OF CONSIDERATION	ENGINEERING	ECONOMIC	ENVIRONMENTAL	PUBLIC HEALTH AND WELFARE	REGULATORY/ LEGAL
1. BEACH NOURISHMENT	Requires hydraulic dredging	Higher costs	Sediment is unsuitable	Sediment is unsuitable	Material does not meet regulations, less than 85% sand
2. SELECTIVE DREDGING	Not practicable for barge maneuvers	Potentially severe consequences loss of trade industry, employment	Continued oversiltation of project site	Would not meet need to restore navigable depths	Requires Federal and State authorization
3. RIVER/HARBOR DISPOSAL (OPEN)	Not feasible for large amounts of material	Costly to transport to available site, frequent dredging may be required if sediments move back into channel	Possible accretion of materials may cause navigational hazards. In shallow water potential aquatic impact to spawning areas	Potential impact to recreation and navigation	Prohibited
4. WETLANDS DISPOSAL (FILLING WETLANDS)	Limited capacity; not available	Transport and pumping costs assumed to be relatively high	Sensitive and susceptible to long-term damage	Wetland areas are valuable resource	Strongly protected by Federal and State statutes
5. SUBAQUEOUS BORROW PITS	Additional sites would have to be created	Expensive, requires capping with clean sand	May alter bottom contours in a way that impacts aquatic resources	Possible short term water contamination. Inaccuracy may result in undesired effects.	Requires regulatory review
6. SANITARY LANDFILL COVER	Land availability problem	Costly to make suitable	Sediments require dewatering and treatment of silt	May meet with opposition locally	Material does not meet regulatory criteria
7. UPLAND DISPOSAL ON-SITE	No available land	Expensive to process material	Organic and silt content high for upland disposal without extensive treatment	Negatively impacts Exxon's operations	Requires Federal and State authorization
8. UPLAND DISPOSAL OFF-SITE	No available land	Expensive to transport/process	Organic and silt content high for upland disposal without extensive treatment	Activity renders large areas of land unsuitable for development. Negatively impacts surrounding community.	Material may not fit requirements and specifications of regulations at municipal level
9. OCEAN DISPOSAL	Technology is available, land operational	Water transport costs are less than land based transport	Testing program will assure environmental acceptability	No long term effects upon food chains	Permitted through this process

APPENDIX B -

ONE-MILE RADIUS MAP

EXXON



SOURCE:
U.S.G.S TOPOGRAPHIC MAP
7.5. MINUTE SERIES
ARTHUR KILL/ELIZABETH, NJ QUADS

PURPOSE: BARGE PIERS
MAINTENANCE DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

ONE MILE RADIUS MAP

EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY
MARINE PROJECTS

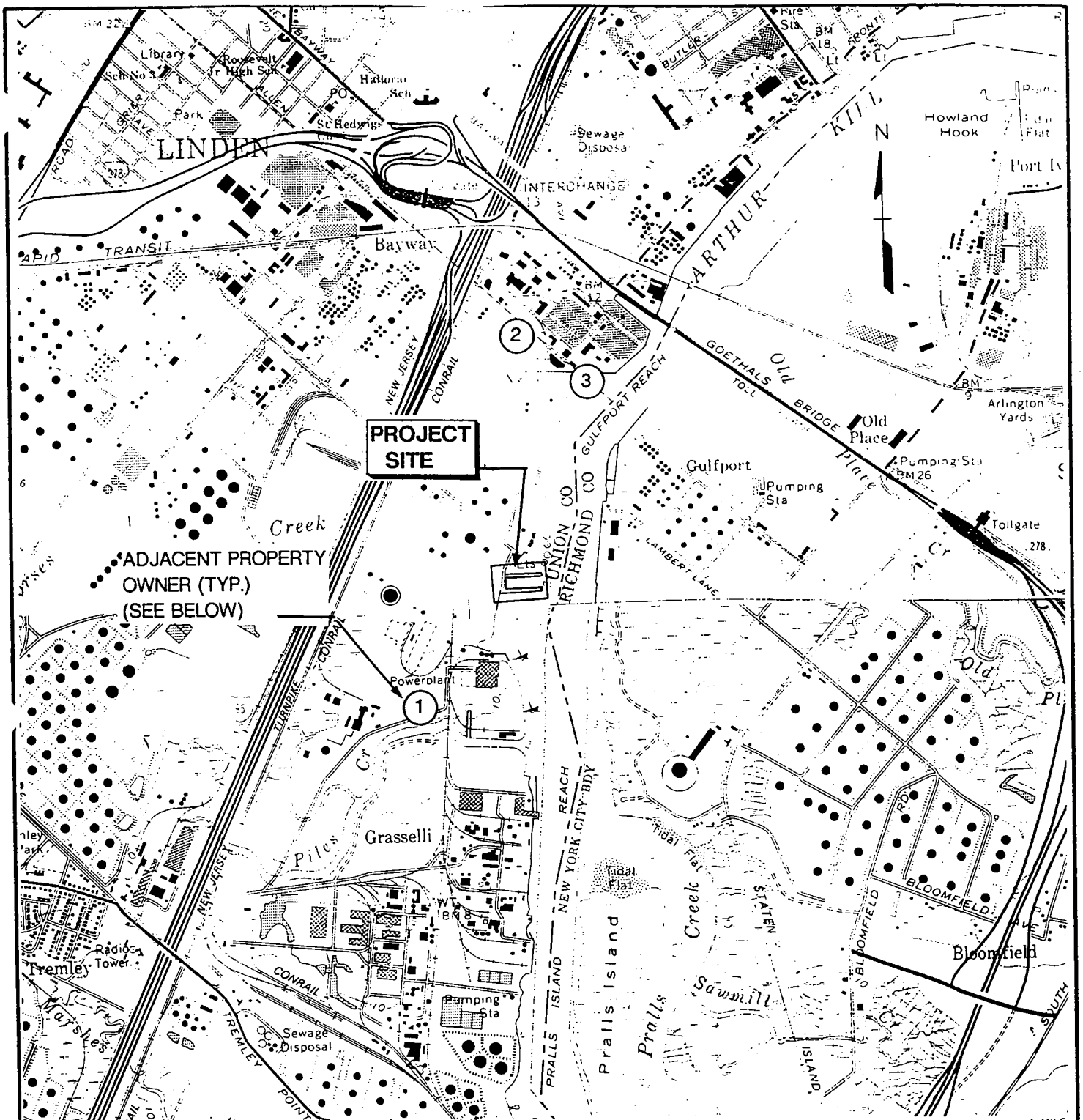
IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

FIGURE 1 DATE MAY 11, 1992

APPENDIX C -

PROJECT DRAWINGS

EXXON



PURPOSE: BARGE PIERS
MAINTENANCE DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS

1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

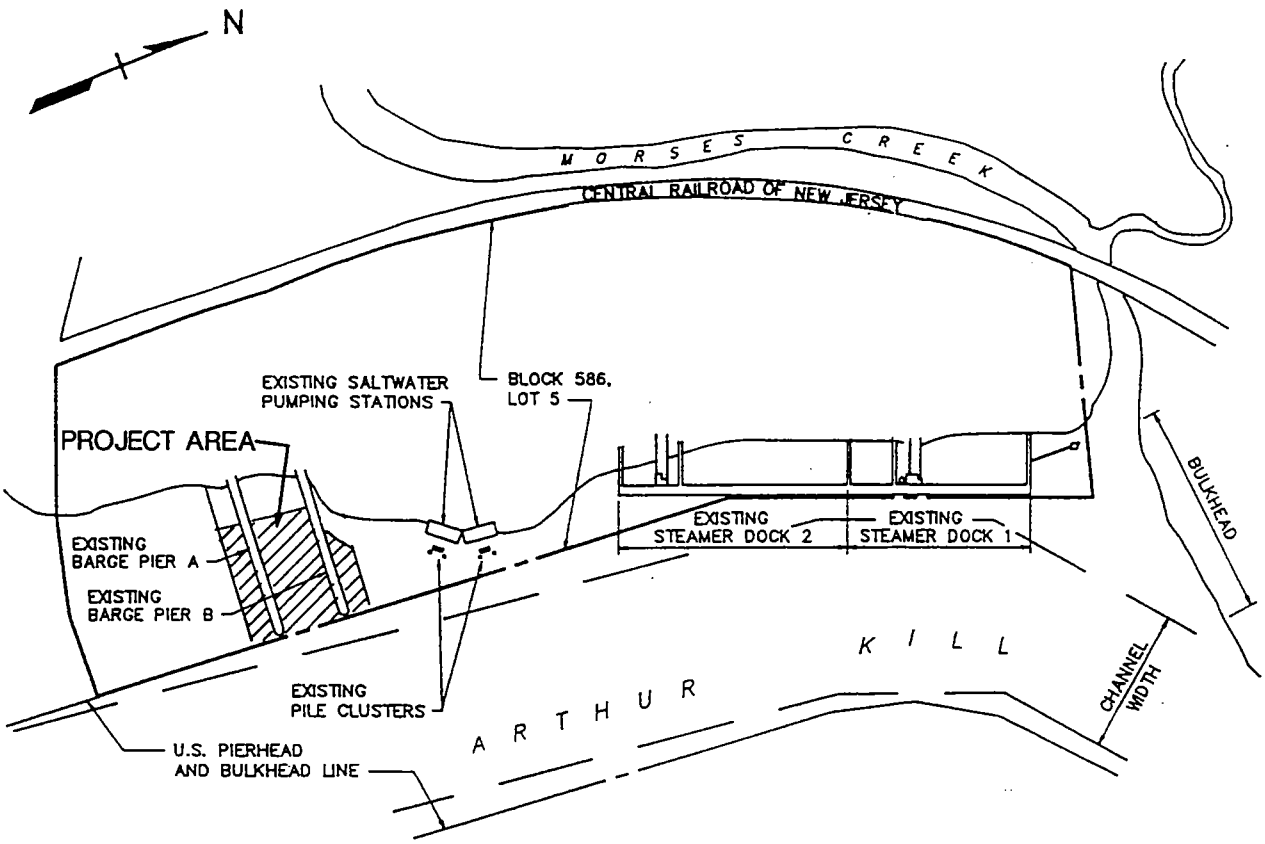
VICINITY MAP

EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY
MARINE PROJECTS

IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

SHEET 1 OF 4 DATE 1/8/92



0 200 400 600 800 1000 FT.

PURPOSE: BARGE PIERS
MAINTENANCE DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

LOCATION PLAN
BARGE PIERS
A AND B

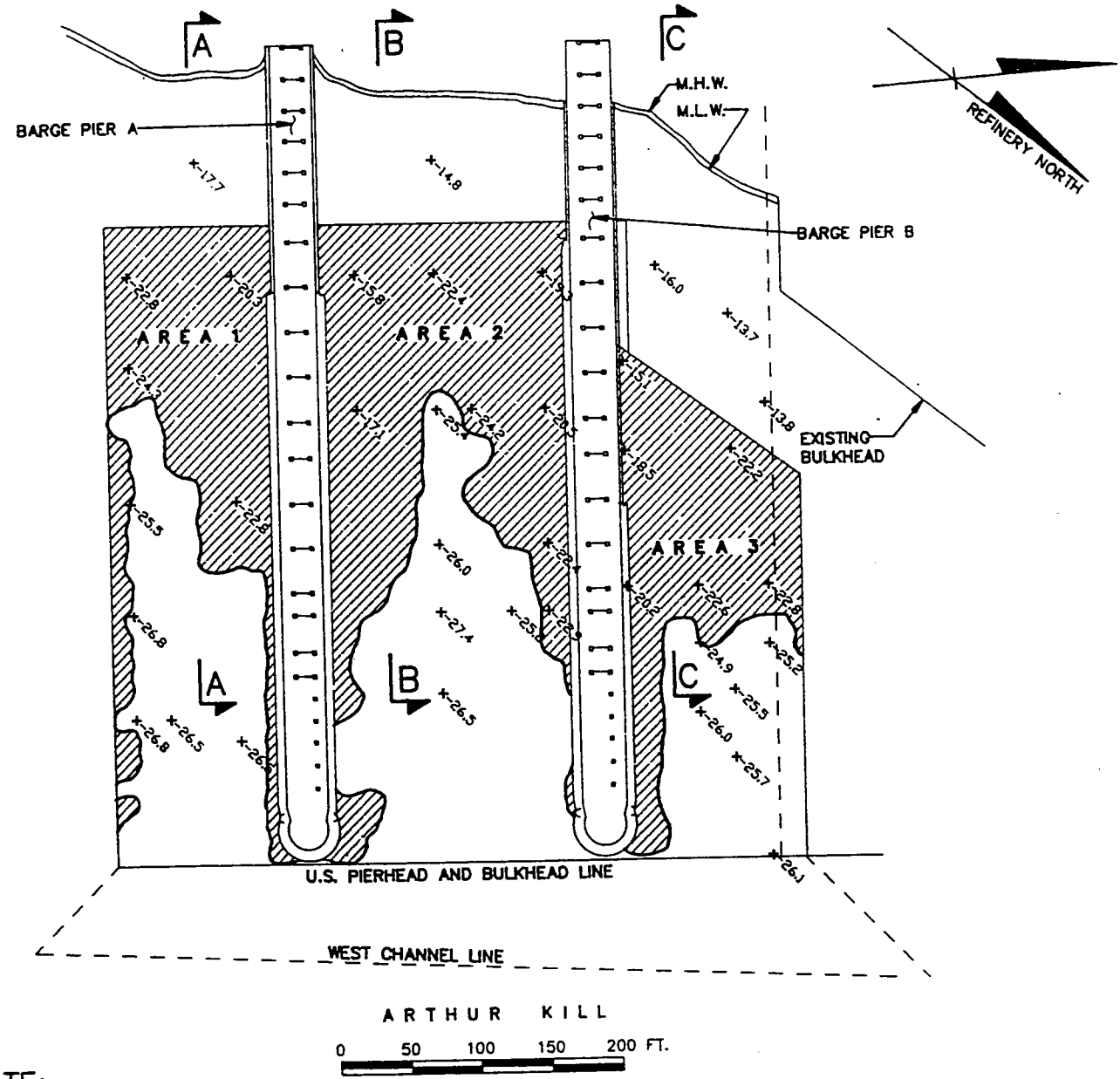
EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY
MARINE PROJECTS

IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

SHEET 2 OF 4 DATE 5/11/92

402-01\FIG\FIG-2C (600)



NOTE:

1. SOUNDINGS TAKEN BY EXXON PERSONNEL USING RAYTHEON FATHOMETER MODEL 719.
2. ALL STATIONS (0+00, 0+25, ETC.) ARE ± 1'–0".
3. SOUNDINGS REFER TO LOCAL MEAN LOW WATER.
4. ELEVATIONS BASED ON BAYWAY REFINERY DATUM, TO CONVERT TO U.S.G.S. SUBTRACT 2.35'.
5. ALL ELEVATIONS ARE (–) MINUS ELEVATIONS.
6. DREDGE TO –25'–0".

DREDGE QUANTITIES – DREDGE TO –25'–0"	
AREA 1	3,095.3 CU. YDS.
AREA 2	5,935.2 CU. YDS.
AREA 3	2,287.6 CU. YDS.
****TOTAL	11,318.1 CU. YDS.

REFERENCE:
M.L.W. =MEAN LOW WATER EL. 0.0'
M.H.W. =MEAN HIGH WATER EL. 4.9'

LEGEND: AREAS TO BE DREDGED

PURPOSE: BARGE PIERS DREDGING

DATUM: MEAN LOW WATER

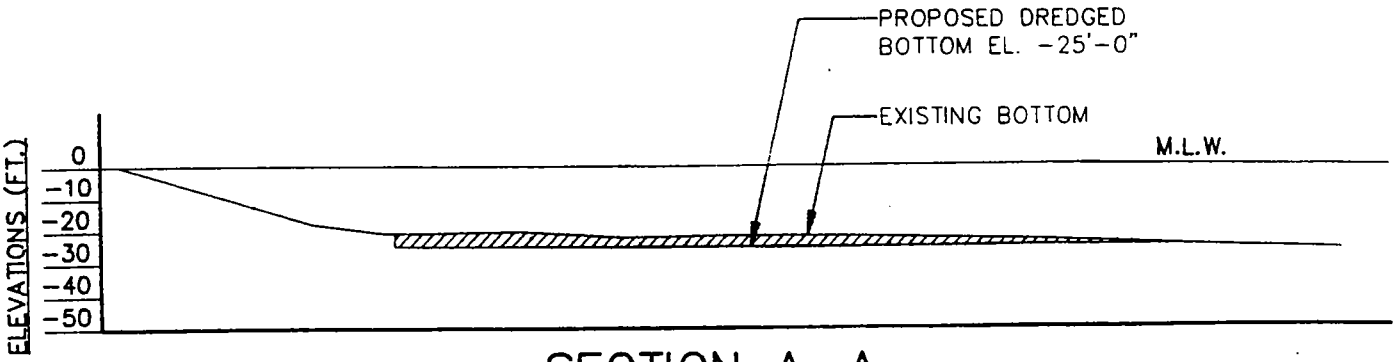
ADJACENT PROPERTY OWNERS:
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

BARGE PIERS A & B SOUNDING GRID AND DREDGING AREA DELINEATION

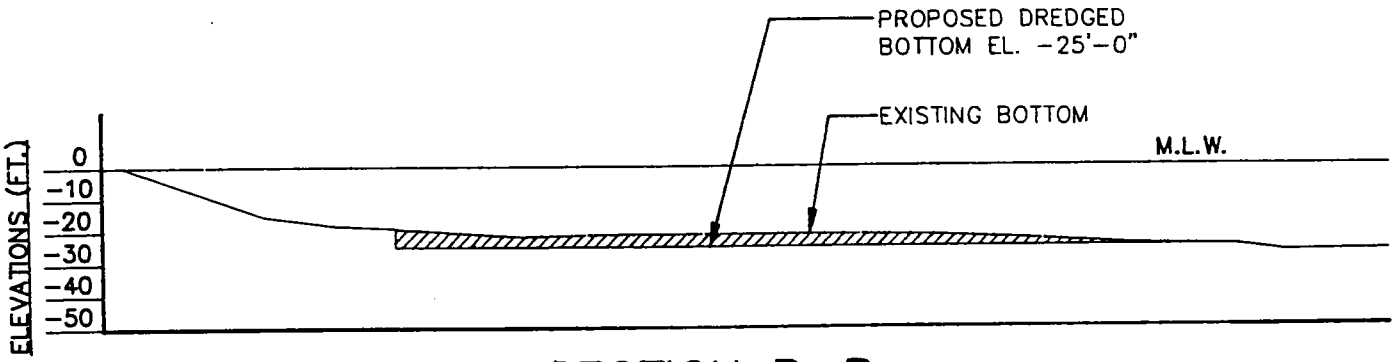
EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY MARINE PROJECTS

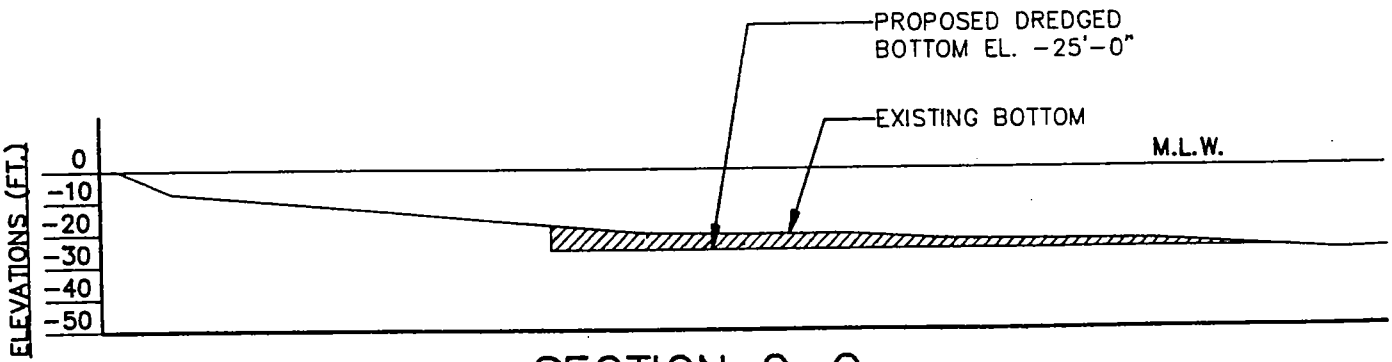
IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.
SOURCE: EXXON COMPANY, U.S.A.
SHEET 3 OF 4 DATE 3–3–1992



SECTION A–A



SECTION B–B



SECTION C–C

LEGEND: AREAS TO BE DREDGED

0 25 50 75 100 FT.
HORIZONTAL SCALE

REFERENCE:
M.L.W. =MEAN LOW WATER EL. 0.0'
M.H.W. =MEAN HIGH WATER EL. 4.9'

PURPOSE: BARGE PIERS DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

BARGE PIERS A & B SECTIONS

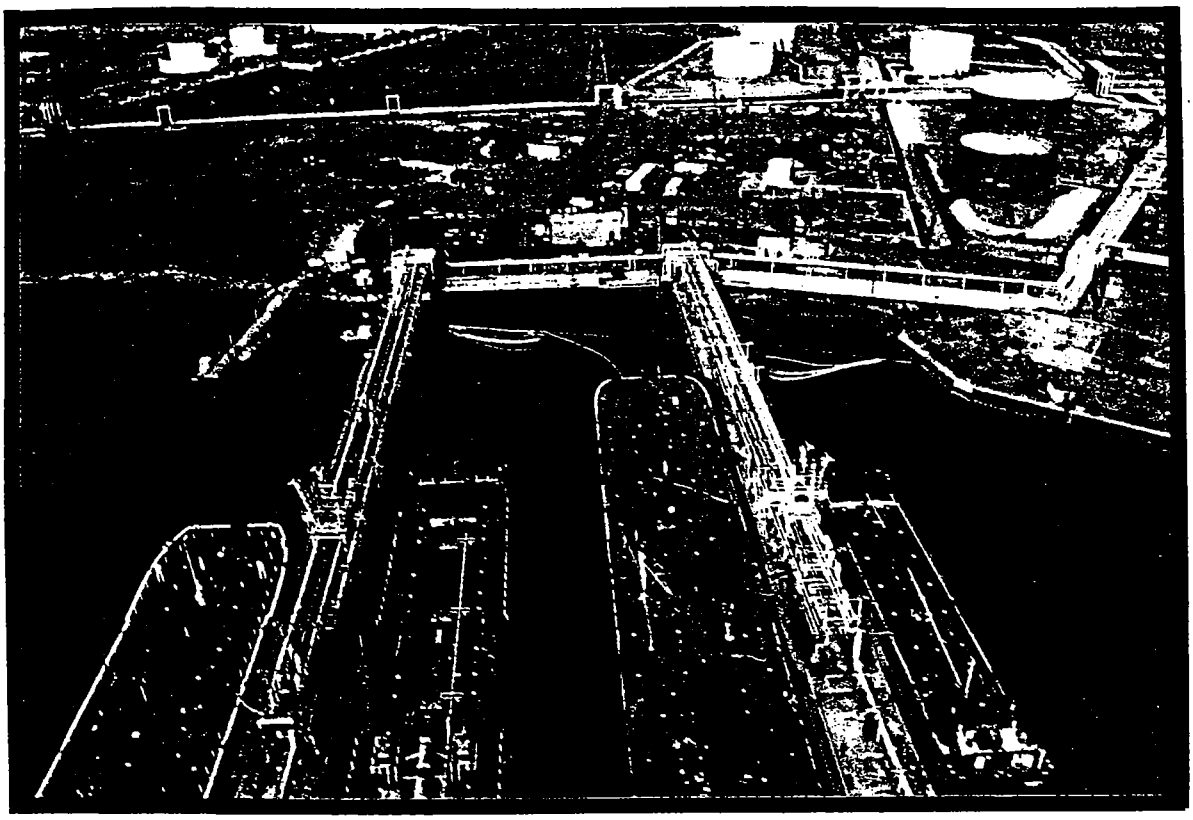
EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY
MARINE PROJECTS

IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.
SOURCE: EXXON COMPANY, U.S.A.
SHEET 4 OF 4 DATE 3-3-1992

APPENDIX D -
PROJECT PHOTOGRAPHS

EXXON



PURPOSE: BARGE PIERS
MAINTENANCE DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS

1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

AERIAL
PHOTOGRAPH

EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY
MARINE PROJECTS

IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

DATE: 5-15-92

APPENDIX E -
DREDGE MATERIAL ANALYSIS

EXXON

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

Jan. 31,1992

Exxon USA
1400 Park Ave.
Linden, NJ 07036

Attn: R.A. Greaux

Nytest is pleased to submit our Project No. 9117786
Log in No. 10854 on your sample (s) received: 12/23/91

Test sample (s) associated with this project will be retained for a period of thirty (30) days, unless otherwise instructed.

My staff is available to answer any questions concerning our report and we look forward to serving your future analytical needs.

Very truly yours,

Nytest Environmental Inc.

Remo Gigante

Remo Gigante
Exec. VP

RG:
Enc.

SHIPPED VIA: UPS RED

box 1518 ☐ 60 seaview blvd., port washington, ny 11050 ☐ (516) 625-5500
fax (516) 625-1274

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

Project No.: 9117786
Log in No. : 10854
P.O. No. : DAWT90312K55485
Date : Jan. 23, 1992

ANALYTICAL DATA REPORT
PACKAGE FOR

Exxon USA

1400 Park Ave.

Linden, NJ 07036

ATTN: R.A. Greaux
REF: Change Order 2

SAMPLE IDENTIFICATION	LABORATORY NUMBER	SAMPLE MATRIX

SEE NEXT PAGE

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

PARAG K. SHAH, Ph. D.
ORGANIC LAB. MANAGER

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

DOUGLAS SHEELEY
LABORATORY DIRECTOR
NJ Cert# 73469

lj

Report on sample(s) furnished by client applies to sample(s). Report on sample(s) obtained by us applies only to lot sampled. Information contained herein is not to be used for reproduction except by special permission. Sample(s) will be retained for thirty days maximum after date of report unless specifically requested otherwise by client. In the event that there are portions or parts of sample(s) remaining after Nytest has completed the required tests. Nytest shall have the option of returning such sample(s) to the client at the client's expense.

NYTEST ENVIRONMENTAL Inc.

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
1085401	AREA 1-1	Miscell.
1085402	AREA 1-2	Miscell.
1085403	AREA 1-3	Miscell.
1085404	AREA 2-4	Miscell.
1085405	AREA 2-5	Miscell.
1085406	AREA 2-6	Miscell.
1085407	AREA 2-7	Miscell.
1085408	AREA 3-8	Miscell.
1085409	AREA 3-9	Miscell.
1085410	AREA 3-10	Miscell.
1085411	SITE 1A	Water
1085412	SITE 1B	Water
1085413	SITE 1C	Water
1085414	SITE 2A	Water
1085415	SITE 2B	Water
1085416	SITE 2C	Water
1085417	SITE 3A	Water
1085418	SITE 3B	Water
1085419	SITE 3C	Water
1085420	ELUT 1A	Water
1085421	ELUT 1B	Water
1085422	ELUT 1C	Water
1085423	ELUT 2A	Water
1085424	ELUT 2B	Water
1085425	ELUT 2C	Water
1085426	ELUT 3A	Water
1085427	ELUT 3B	Water
1085428	ELUT 3C	Water

CHAIN OF CUSTODY RECORD

FACILITY/LOCATION:	METHOD OF SHIPMENT: COURIER TO NYTEST FROM ASI
EXXON BAYWAY	
SAMPLING AND ANALYSES AUTHORIZED BY: ASI	DATE: 12-23-91

SAMPLE #	SAMPLING LOCATION AND DESCRIPTION	DATE	TIME	SAMPLE TYPE C	SAMPLE TYPE G	SAMPLE TYPE SOLID	# OF CONT.	ANALYSES REQUIRED
	SITE H_2O AREA 1	12/23			✓		2,5gal	
	SITE H_2O AREA 2	12/23			✓		2,5gal	
	SITE H_2O ARE 3	12/23			✓		2,5gal	
	BULK SEDIMENT CORES 1-10	12/23				SED	18, 1qt 2, ½gal	
	SEDIMENT FOR DIOXIN CORES 1-10	12/23				SED	10, 4oz	

SAMPLE COLLECTED BY: ASI	EXACT SAMPLING LOCATION: EXXON - BAYWAY REFINERY		
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE 12/23/91	TIME 2:00
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE 12/23/91	TIME 6:45
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME

SAMPLE RELINQUISHED AFTER ANALYSES:	ANALYZED SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE DESCRIPTION:	# OF CONTAINERS:		

FORM № 2265

AQUA SURVEY, INC.

00001

DATA REPORTING COMMENT PAGE

QUALIFIERS:

U - Indicates compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the reported detection limit but greater than zero.

B - This flag is used when the analyte is found in the method blank as well as in the sample.

T - This flag identifies all targeted compounds that were found above the method detection limits.

A - Aldol Condensation Product (formed from Acetone reacting with Methylene Chloride solvents used in the extraction of soil samples, not associated with sample constituents)

D - Diluted out

NA - Not applicable by contract

Data on soil samples are expressed on a dry weight basis.

All non-aqueous samples are reported on soil forms. This includes samples whose matrix is listed as miscellaneous.

The Initial and Continuing Calibration dates and times for the volatile fractions are listed on the BFB summary forms.

The Initial and Continuing Calibration dates and times for the semivolatile fractions are listed on the DFTPP summary forms.

SAMPLE SUFFIXES:
RE - Re-analyzed sample
DL - Sample analyzed at a secondary dilution

METHOD BLANK NOMENCLATURE - FBLK##:

F - Fraction (V for Volatiles, S for Semivolatiles)
BLK - Indicates a blank
- Arbitrarily assigned number for that blank

GC/MS STANDARD NOMENCLATURE - FSTD###:

F - Fraction (V for Volatiles, S for Semivolatiles)
STD - Indicates a standard
- Concentration in ppb of Volatile standards, or amount injected in ng for Semivolatile standards

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854

We find as follows:

Results in pg/g:

Sample Identification		Parameter(s)	
		2,3,7,8,-TCDD	% Recovery
1085401	AREA 1-1	20	111
1085402	AREA 1-2	16	98
1085403	AREA 1-3	13	120
1085404	AREA 2-4	30	110
1085405	AREA 2-5	16	116
1085406	AREA 2-6	14	118
1085407	AREA 2-7	26	102
1085408	AREA 3-8	28	110
1085409	AREA 3-9	15	98
1085410	AREA 3-10	24	102
Method Blank		ND	92

ND = None detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854

GRAIN SIZE

We find as follows:

Results in % by weight (dry basis):

Sample Identification		Parameter(s)			
		Sand	Clay	Silt	Total Solids
1085401	AREA 1-1	4.9	28.4	66.7	30.3
1085402	AREA 1-2	3.8	31.0	65.2	34.7
1085403	AREA 1-3	3.4	31.3	65.3	27.3
1085404	AREA 2-4	2.5	32.8	64.7	31.8
1085405	AREA 2-5	2.4	33.3	64.3	26.4
1085406	AREA 2-6	3.3	31.5	65.2	26.2
1085407	AREA 2-7	2.4	32.8	64.8	33.0
1085408	AREA 3-8	5.9	29.9	64.2	38.6
1085409	AREA 3-9	2.1	33.3	64.6	28.6
1085410	AREA 3-10	3.5	32.2	64.3	35.4

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854

We find as follows:

Parameter(s)	Sample Identification				
	AREA 1-1 (1085401)	AREA 1-2 (1085402)	AREA 1-3 (1085403)	AREA 2-4 (1085404)	AREA 2-5 (1085405)
% Moisture	69.7	65.3	72.7	68.2	73.6
Results in mg/kg (dry wt. basis):					
Copper	683	348	335	553	534
Nickel	79.8	40.0	43.6	62.2	79.0
Zinc	779	403	355	657	672
Total Organic Carbon	47300	45300	40400	35600	46600

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854

We find as follows:

Parameter(s)	Sample Identification				
	AREA 2-6 (1085406)	AREA 2-7 (1085407)	AREA 3-8 (1085408)	AREA 3-9 (1085409)	AREA 3-10 (1085410)
% Moisture	73.8	67.0	61.4	71.4	64.6
Results in mg/kg (dry wt. basis):					
Copper	473	524	562	367	548
Nickel	57.4	55.2	60.6	41.9	55.4
Zinc	580	589	614	448	605
Total Organic Carbon	35900	40000	47300	48000	64700

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 1-1
Lab Id No.: 1085401

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 1-1
Lab ID No.: 1085401

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	1.0 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.:AREA 1-1
Lab Id No.: 1085401

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	ND
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	12 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.:AREA 1-1
Lab Id No.: 1085401

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 1-1
Lab Id No.: 1085401

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 1-2
Lab Id No.: 1085402

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 1-2
Lab ID No.: 1085402

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	2.0 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 1-2
Lab Id No.: 1085402

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	ND
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	52 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 1-2
Lab Id No.: 1085402

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 1-2
Lab Id No.: 1085402

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 1-3
Lab Id No.: 1085403

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 1-3
Lab ID No.: 1085403

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	490 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	16 T
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	250 T
Ethylbenzene	2.3	75 T
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 1-3
Lab Id No.: 1085403

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	13 TB
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	8.0 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 1-3
Lab Id No.: 1085403

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 1-3
Lab Id No.: 1085403

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 2-4
Lab Id No.: 1085404

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 2-4
Lab ID No.: 1085404

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	9.0 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 2-4
Lab Id No.: 1085404

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	11 TB
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	7.0 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 2-4
Lab Id No.: 1085404

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 2-4
Lab Id No.: 1085404

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 2-5
Lab Id No.: 1085405

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 2-5
Lab ID No.: 1085405

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	1.0 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 2-5
Lab Id No.: 1085405

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	ND
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	11 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 2-5
Lab Id No.: 1085405

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 2-5
Lab Id No.: 1085405

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 2-6
Lab Id No.: 1085406

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 2-6
Lab ID No.: 1085406

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	11 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 2-6
Lab Id No.: 1085406

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	16 TB
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	31 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 2-6
Lab Id No.: 1085406

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 2-6
Lab Id No.: 1085406

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 2-7
Lab Id No.: 1085407

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 2-7
Lab ID No.: 1085407

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	8.0 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 2-7
Lab Id No.: 1085407

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	58 TB
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	12 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 2-7
Lab Id No.: 1085407

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 2-7
Lab Id No.: 1085407

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 3-8
Lab Id No.: 1085408

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 3-8
Lab ID No.: 1085408

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	3.0 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 3-8
Lab Id No.: 1085408

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	37 TB
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	11 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 3-8
Lab Id No.: 1085408

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 3-8
Lab Id No.: 1085408

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 3-9
Lab Id No.: 1085409

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 3-9
Lab ID No.: 1085409

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	16 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 3-9
Lab Id No.: 1085409

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	28 TB
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	14 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 3-9
Lab Id No.: 1085409

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 3-9
Lab Id No.: 1085409

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: AREA 3-10
Lab Id No.: 1085410

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: AREA 3-10
Lab ID No.: 1085410

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	3.0 TB
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: AREA 3-10
Lab Id No.: 1085410

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	28 TB
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	9.0 TB
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 3-10
Lab Id No.: 1085410

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: AREA 3-10
Lab Id No.: 1085410

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id No.: SITE 1 ELUT 1.
Lab Id No.:

Parameter(s)

SITE WATER ANALYSIS

	Cadmium	Mercury	Total Petroleum Hydrocarbons	PCB's	DDT's
Results in ug/l:					
Original	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Duplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Triplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05

ELUTRIATE ANALYSIS

	Cadmium	Mercury	Total Petroleum Hydrocarbons	PCB's	DDT's
Results in ug/l:					
Original	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Duplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Triplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id No.: SITE 2. ELUT 2.
Lab Id No.: [illegible] 1085423

Parameter(s)

SITE WATER ANALYSIS

	Cadmium	Mercury	Total Petroleum Hydrocarbons	PCB's	DDT's
Results in ug/l:					
Original	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Duplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
riplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05

ELUTRIATE ANALYSIS

	Cadmium	Mercury	Total Petroleum Hydrocarbons	PCB's	DDT's
Results in ug/l:					
Original	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Duplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Triplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id No.: SITE 3, ELUT 3
Lab Id No.:

Parameter(s)

SITE WATER ANALYSIS

	Cadmium	Mercury	Total Petroleum Hydrocarbons	PCB's	DDT's
Results in ug/l:					
Original	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Duplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Triplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05

ELUTRIATE ANALYSIS

	Cadmium	Mercury	Total Petroleum Hydrocarbons	PCB's	DDT's
Results in ug/l:					
Original	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Duplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05
Triplicate	< 0.1	< 0.2	< 50.0	< 0.1	< 0.05

nytest environmental inc.

REPORT OF ANALYSIS

NJ WATER QUALITY
for Elutriates

Log In No.: 10854
Sample Id: Method Blk
Lab Id No.: Blank

Parameters	MDL (ug/l)	Found (ug/l)
Antimony	22.0	ND
Arsenic	5.0	ND
Barium	20	ND
Beryllium	2.0	ND
Cadmium	3.5	ND
Chromium (VI)	8.0	ND
Copper	2.0	ND
Cyanide	20.0	ND
Lead	17.0	ND
Mercury	0.2	ND
Nickel	22	ND
Phenol	1.0	ND
Selenium	5.0	ND
Silver	5.0	ND
Thallium	5.0	ND
Zinc	5.0	ND

ND = None Detected

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: VBLKC74
Lab ID No.: C6177

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	ND
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc

REPORT OF ANALYSIS

Log In No.: 10854
Sample ID.: VBLKC75
Lab ID No.: C6194

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Vinyl Chloride	1.5	ND
Methylene Chloride	0.6	2.0 T
1,1-Dichloroethylene	2.1	ND
Chloroform	1.4	ND
1,2-Dichloroethane	1.2	ND
1,1,1-Trichloroethane	1.6	ND
Carbon Tetrachloride	2.3	ND
Bromodichloromethane	1.8	ND
cis-1,3-Dichloropropene	1.6	ND
Trichloroethene	2.3	ND
Dibromochloromethane	1.8	ND
1,1,2-Trichloroethane	1.6	ND
Benzene	1.7	ND
Trans-1,3-Dichloropropene	1.3	ND
Bromoform	1.8	ND
Tetrachloroethene	2.5	ND
1,1,2,2-Tetrachloroethane	0.2	ND
Toluene	2.0	ND
Ethylbenzene	2.3	ND
Acrolein	100.0	ND
Acrylonitrile	100.0	ND

nytest environmental inc.

REPORT OF ANALYSIS

We find as follows:

Log In No.: 10854
Sample Id.: SBLKF76
Lab Id No.: F9466

Parameter(s)	MDL (ug/l)	Results (ug/l)
bis(2-Chloroethyl)ether	1.8	ND
1,3-Dichlorobenzene	0.7	ND
1,2-Dichlorobenzene	0.5	ND
bis(2-chloroisopropyl)ether	1.7	ND
Hexachloroethane	1.0	ND
Nitrobenzene	1.3	ND
Isophorone	1.7	ND
1,2,4-Trichlorobenzene	0.3	ND
Hexachlorocyclopentadiene	1.8	ND
Dimethyl Phthalate	1.8	ND
Diethylphthalate	3.5	ND
N-Nitrosodiphenylamine	1.9	ND
Hexachlorobenzene	1.3	ND
Di-n-Butylphthalate	1.3	14 T
Butylbenzylphthalate	0.8	ND
3,3'-Dichlorobenzidine	2.0	ND
bis(2-Ethylhexyl)Phthalate	1.5	5.0 T
N-Nitrosodimethylamine	10.0	ND
Benzidine	80.0	ND
1,2 Diphenylhydrazine	NA	ND
Hexachloro-1,3-butadiene	NA	ND
Acenaphthylene	0.6	ND
Acenaphthene	0.6	ND
Fluorene	1.6	ND
Phenanthrene	0.8	ND
Anthracene	0.5	ND
Fluoranthene	3.0	ND
Pyrene	1.4	ND
Benzo(a)Anthracene	0.5	ND
Chrysene	0.7	ND
Benzo(b)Fluoranthene	2.4	ND
Benzo(k)Fluoranthene	1.4	ND
Benzo(a)Pyrene	0.7	ND
Indeno(1,2,3-cd)Pyrene	1.8	ND
Dibenz(a,h)Anthracene	1.6	ND
Benzo(g,h,i)Perylene	1.8	ND
Phenol	2.4	ND
2-Chlorophenol	0.3	ND

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: SBLKF76
Lab Id No.: F9466

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
2,4-Dimethylphenol	0.9	ND
2,4-Dichlorophenyl	0.7	ND
4-Chloro-3-Methylphenol	1.9	ND
2,4,6-Trichlorophenol	2.3	ND
2,4-Dinitrophenol	1.9	ND
4,6-Dinitro-2-Methylphenol	1.5	ND
Pentachlorophenol	0.8	ND

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 10854
Sample Id.: PBLK1
Lab Id No.: PBLK1

We find as follows:

Parameter(s)	MDL (ug/l)	Results (ug/l)
Alpha-BHC	0.002	ND
Beta-BHC	0.002	ND
Gamma-BHC (Lindane)	0.005	ND
Heptachlor	0.004	ND
Aldrin	0.003	ND
Heptachlor Epoxide	0.003	ND
Endosulfan I	0.005	ND
Dieldrin	0.003	ND
4,4'-DDE	0.012	ND
Endrin	0.017	ND
Endosulfan II	0.009	ND
4,4-DDD	0.032	ND
Endosulfan Sulfate	0.037	ND
4,4'-DDT	0.011	ND
Chlordane	0.500	ND
Toxaphene	0.131	ND
Aroclor-1016	0.180	ND
Aroclor-1221	0.102	ND
Aroclor-1232	0.062	ND
Aroclor-1242	0.054	ND
Aroclor-1248	0.038	ND
Aroclor-1254	0.121	ND
Aroclor-1260	0.102	ND

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

February 20, 1992

Exxon USA
1400 Park Ave.
Linden, NJ 07036

Attn: R.A. Greaux

Nytest is pleased to submit our Project No. 9117786
Log in No. 11050 on your sample (s) received: 1/14/92

Test sample (s) associated with this project will be retained for a period of thirty (30) days, unless otherwise instructed.

My staff is available to answer any questions concerning our report and we look forward to serving your future analytical needs.

Very truly yours,

Nytest Environmental Inc.

Remo Gigante
Exec. VP

RG:
Enc.

SHIPPED VIA: Regular Mail

box 1518 ☐ 60 seaview blvd., port washington, ny 11050 ☐ (516) 625-5500
fax (516) 625-1274

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

Project No.: 9117786
Log in No. : 11050
P.O. No. :DAWT90312K55485
Date : Feb. 19, 1992

ANALYTICAL DATA REPORT
PACKAGE FOR

Exxon USA

1400 Park Ave.

Linden, NJ 07036

ATTN: R.A. Greaux
REF: Add work to Login # 10854

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE

SEE NEXT PAGE

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

PARAG K. SHAH, Ph. D.
ORGANIC LAB. MANAGER
lj

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

Douglas Sheeley

DOUGLAS SHEELEY
LABORATORY DIRECTOR
NJ Cert# 73469

Report on sample(s) furnished by client applies to sample(s). Report on sample(s) obtained by us applies only to lot sampled. Information contained herein is not to be used for reproduction except by special permission. Sample(s) will be retained for thirty days maximum after date of report unless specifically requested otherwise by client. In the event that there are portions or parts of sample(s) remaining after Nytest has completed the required tests, Nytest shall have the option of returning such sample(s) to the client at the client's expense.

NYTEST ENVIRONMENTAL Inc.

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
1105001	AREA1-1	Miscell.
1105002	AREA1-2	Miscell.
1105003	AREA1-3	Miscell.
1105004	AREA2-4	Miscell.
1105005	AREA2-5	Miscell.
1105006	AREA2-6	Miscell.
1105007	AREA2-7	Miscell.
1105008	AREA3-8	Miscell.
1105009	AREA3-9	Miscell.
1105010	AREA3-10	Miscell.

Table of Contents

Log in No.: 11050

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IX. Quality Assurance Summary	NA

nytest environmental inc.

Laboratory Chronicle

Log In No.: 11050

Client Name: Exxon USA
Date Received: 12/23/91
Sample ID: As per cover page

Organics Extraction:

1. Acids _____
2. Base/Neutrals _____
3. Pesticides/PCBs 1/27/92
4. Dioxin _____

Analysis:

1. Volatiles _____
2. Acids _____
3. Base/Neutrals _____
4. Pesticides/PCBs 2/1/92
5. Dioxin _____

Section Supervisor Review & Approval PMS

Inorganics:

1. Metals _____
2. Cyanides _____
3. Phenols _____

Other Analysis:

Elutriate extraction: 1/16/92

Section Supervisor Review & Approval PMS

Quality Control Supervisor Review & Approval QVS

If fractions are re-extracted and re-analyzed include dates for both.

0u001

nytest environmental inc.

NON-CONFORMANCE SUMMARY
(Case Narrative)

Log In No: 11050

This data package represents Dioxin analysis requested for elutriates extracted from samples received 12/23/91 and originally entered as Log In 10845. Samples were analyzed as per required protocols, no problems were encountered.

nytest environmental inc.

METHODOLOGY SUMMARY

AQUEOUS METHODOLOGIES:	REF 1	REF 2	REF 3
BNA, Pesticides/PCB's Extraction		3510	
AA/ICP Sample Preparation	200.7		
Furnace Sample Preparation	200.0		
Mercury Sample Preparation	245.1		
Hexavalent Chromium Sample Preparation	218.5		
Clean-Up		3610/3640	
Organochlorine Pesticides and PCB's by Gas Chromatography			608
Herbicides by Gas Chromatography			362
Purgeable Organics by GC/MS			624
Base/Neutral, Acids by GC/MS			625
2,3,7,8-TCDD by GC/MS			613/625
BTEX			602

NON-AQUEOUS METHODOLOGIES:	
BNA, Pesticides/PCB's Extraction	3550
AA/ICP Sample Preparation	3050
Furnace Sample Preparation	3020/3030/3050
Mercury Sample Preparation	7471
Clean-Up	3610/3640

Gas Chromatography/Mass Spectrometry:	
Purgeable Organics	8240
Base/Neutral and Acid Extractables	8270
Organophosphorous Pesticides	8140
Organochlorine Pesticides and PCB's by Gas Chromatography	8080
BTEX	8020

METHODOLOGY SUMMARY

INDUCTIVELY COUPLED PLASMA (ICP):	REFERENCE 1	REFERENCE 2
Aluminum	200.7	6010
Antimony	200.7	6010
Barium	200.7	6010
Beryllium	200.7	6010
Cadmium	200.7	6010
Calcium	200.7	6010
Chromium	200.7	6010
Cobalt	200.7	6010
Copper	200.7	6010
Iron	200.7	6010
Lead	200.7	6010
Magnesium	200.7	6010
Manganese	200.7	6010
Molybdenum	200.7	6010
Nickel	200.7	6010
Potassium	200.7	6010
Silver	200.7	6010
Sodium	200.7	6010
Tin	200.7	6010
Titanium	200.7	6010
Vanadium	200.7	6010
Zinc	200.7	6010

FURNACE AA:		
Antimony	204.1	7041
Arsenic	206.2	7060
Lead	239.2	7421
Selenium	270.2	7740
Thallium	279.2	7841
Tin	282.2	
Vanadium	286.2	7911
Mercury	245.1	7470

METHODOLOGY SUMMARY

ADDITIONAL INORGANIC PARAMETERS:	REFERENCE 1	REFERENCE 2
Bromide	320.1	
Color	110.2	
Conductance	120.1	
Conductance		9050
Odor	140.1	
pH	150.1	
pH		9040
TDS	160.1	
TSS	160.2	
TS	160.3	
Hardness	130.1	
Temperature	170.1	
Turbidity	180.1	
Acidity	305.1	
Alkalinity	310.1	
Ammonia	350.2/350.3	
Chloride	325.3	
Chloride		9252
Residual Chlorine	330.2	
COD	410.3/410.4	
Cyanide	335.3	
Oil and Grease	413.1/413.2	
Oil and Grease		9070
Fluoride	340.2	
TKN	351.2	
NO2/NO3	353.2	
D.O.	360.2	
Petroleum Hydrocarbons (Reference 4)	418.1	
Phenol	420.2	
Phosphorous	365.1	
Silica	370.1	
Sulfate	375.2/375.4	
Sulfide	376.1	
Surfactants	425.1	
TOC	415.1	
TOX		9022

MISCELLANEOUS ANALYSIS:	
Extraction Procedure Toxicity	1310
Ignitability	1010
Corrosivity	1110
Reactivity	Chapter 8.3
Toxicity Characteristic Leaching Procedure (TCLP)	(Ref. 5)

METHODOLOGY SUMMARY

REFERENCES:

(1) USEPA-600/4-79-020, Methods for Chemical Analysis of Water and Waste
(2) USEPA SW 846, Test Methods for Evaluating Solid Waste, Third Edition
(3) Federal Register 40 CFR Part 136, Vol. 49, No. 209 Test Parameters for the Analysis of Pollutants
(4) as modified by NJDEP-BISE (for non-aqueous samples)
(5) Federal Register Vol. 51, No. 216 Friday, 11/7/86, pp. 40643-40652

DATA REPORTING COMMENT PAGE

QUALIFIERS:

U - Indicates compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the reported detection limit but greater than zero.

B - This flag is used when the analyte is found in the method blank as well as in the sample.

T - This flag identifies all targeted compounds that were found above the method detection limits.

A - Aldol Condensation Product (formed from Acetone reacting with Methylene Chloride solvents used in the extraction of soil samples, not associated with sample constituents)

D - Diluted out

NA - Not applicable by contract

Data on soil samples are expressed on a dry weight basis.

All non-aqueous samples are reported on soil forms. This includes samples whose matrix is listed as miscellaneous.

The Initial and Continuing Calibration dates and times for the volatile fractions are listed on the BFB summary forms.

The Initial and Continuing Calibration dates and times for the semivolatile fractions are listed on the DFTPP summary forms.

SAMPLE SUFFIXES: RE - Re-analyzed sample
DL - Sample analyzed at a secondary dilution

METHOD BLANK NOMENCLATURE - FBLK##:

F - Fraction (V for Volatiles, S for Semivolatiles)
BLK - Indicates a blank
- Arbitrarily assigned number for that blank

GC/MS STANDARD NOMENCLATURE - FSTD###:

F - Fraction (V for Volatiles, S for Semivolatiles)
STD - Indicates a standard
- Concentration in ppb of Volatile standards, or amount injected in ng for Semivolatile standards

nytest environmental inc.

REPORT OF ANALYSIS

Log In No.: 11050

We find as follows: ELUTRIATE ANALYSIS

Results in pg/l:

Sample Identification	Parameter(s)
	2,3,7,8-TCDD
1105001 AREA 1-1	16
1105002 AREA 1-2	24
1105003 AREA 1-3	ND
1105004 AREA 2-4	ND
1105005 AREA 2-5	ND
1105006 AREA 2-6	ND
1105007 AREA 2-7	14
1105008 AREA 3-8	ND
1105009 AREA 3-9	ND
1105010 AREA 3-10	16
Method Blank	ND

ND = None Detected

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT
nytest environmental inc.

April 16,1992

Exxon USA
1400 Park Ave.
Linden, NJ 07036

Attn: R.A. Greaux

Nytest is pleased to submit our Project No. 9117786
Log in No. 11640,11873 on your sample (s) received: 3/4,24/92

Test sample (s) associated with this project will be retained for a period of thirty (30) days, unless otherwise instructed.

My staff is available to answer any questions concerning our report and we lock forward to serving your future analytical needs.

Very truly yours,

Nytest Environmental Inc.

Remo Gigante

Remo Gigante
Exec. VP

RG:
Enc.

SHIPPED VIA: NEI DRIVER

box 1518 □ 60 seaview blvd., port washington, ny 11050 □ (516) 625-5500
fax (516) 625-1274

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

Project No.: 9117786
Log in No. : 11640, 11873
P.O. No. : DAWT90312K55485
Date : April 16, 1992

ANALYTICAL DATA REPORT
PACKAGE FOR

Exxon USA

1400 Park Ave.

Linden, NJ 07036

ATTN: R. A. Greaux
REF: Exxon Bayway

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE

SEE ENCLOSED RESULTS

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

PARAG K. SHAH, Ph. D.
ORGANIC LAB. MANAGER
pjd

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

DOUGLAS SHEELEY
LABORATORY DIRECTOR
NJ Cert# 73469

Report on sample(s) furnished by client applies to sample(s). Report on sample(s) obtained by us applies only to lot sampled. Information contained herein is not to be used for reproduction except by special permission. Sample(s) will be retained for thirty days maximum after date of report unless specifically requested otherwise by client. In the event that there are portions or parts of sample(s) remaining after Nytest has completed the required tests, Nytest shall have the option of returning such sample(s) to the client at the client's expense.

OCEAN DISPOSAL BIOMONITORING REPORT FOR EXXON, BAYWAY REFINERY NEW GUIDANCE STUDIES

NYTEST ENVIRONMENTAL, INC.
P.O. BOX 1518
60 SEAVIEW BLVD.
PORT WASHINGTON, NEW YORK 11050

APRIL 7, 1992

BR92-1787

JOB # 91-361

I. SCOPE OF WORK

A. Location and Purpose

The field sampling, biological assay and analytical testing described in this report was performed with respect to dredged material from the Arthur Kill to be disposed of in ocean waters.

B. Services

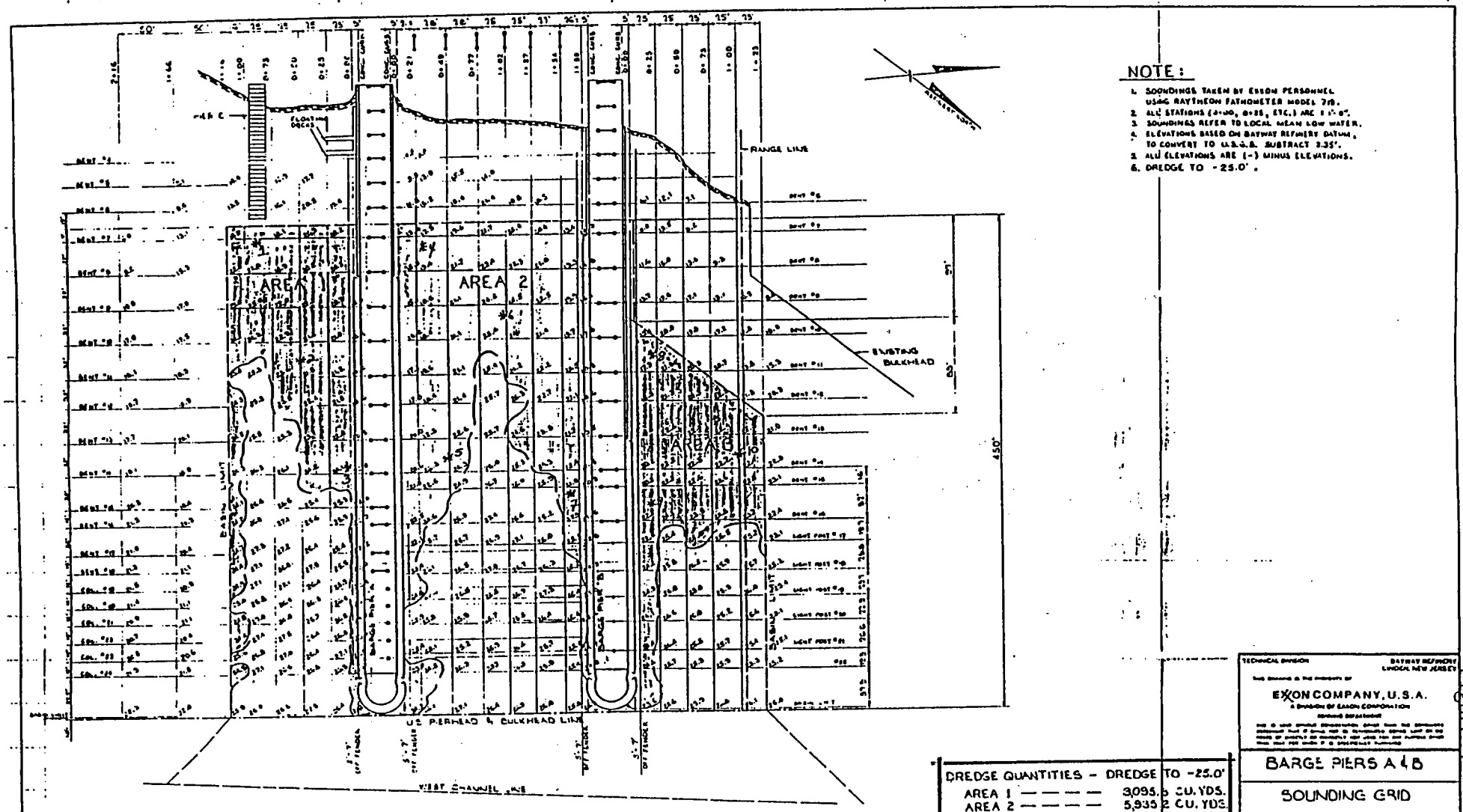
1. Aqua Survey, Inc. (ASI) was engaged by NYTEST to perform the following services:

   a. ASI oversaw the collection of ten (10) core samples of sediment which were cored to project depth. The cores were taken from locations identified on a Sampling Plan developed by the Army Corps of Engineers (ACE).

   b. Control and reference sediment samples were collected from locations designated by the ACE.

   c. ASI provided NYTEST with ten homogenous sediment samples for 2,3,7,8-TCDD analysis.

   d. A 28-day Solid Phase Bioassay was performed to determine the potential for 2,3,7,8-TCCD bioaccumulation in Neries virens. Pre-test, reference and test tissues were prepared and sent to NYTEST for 2,3,7,8-TCDD analysis.



NOTE:

1. SOUNDINGS TAKEN BY EXXON PERSONNEL USING RAYTHEON FATHOMETER MODEL 719.
2. ALL STATIONS (0+00, 0+25, ETC.) ARE 1 1'-0".
3. SOUNDINGS REFER TO LOCAL MEAN LOW WATER.
4. ELEVATIONS BASED ON BAYWAY REFINERY DATUM, TO CONVERT TO U.S.C.&G. SUBTRACT 3.35'.
5. ALL ELEVATIONS ARE (-) MINUS ELEVATIONS.
6. DREDGE TO -25.0'.

DREDGE QUANTITIES - DREDGE TO -25.0'	
AREA 1	3,095.6 CU. YDS.
AREA 2	5,935.2 CU. YDS.
AREA 3	2,287.6 CU. YDS.
* * * TOTAL	11,318.1 CU. YDS.

OCT. 1991

TECHNICAL DIVISION — BAYWAY REFINERY LINDEN, NEW JERSEY

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

BARGE PIERS A & B

SOUNDING GRID

DRAWING	DATE	APPROVAL	DATE
GJF/MLL/LJK		MECHANICAL ENGR.	
DRAWN		PROJECT ENGR.	
ENGR.		OPERATING SUPT.	
SURVEYOR			

ADDED SOUNDINGS AND DREDGE QUANTITIES

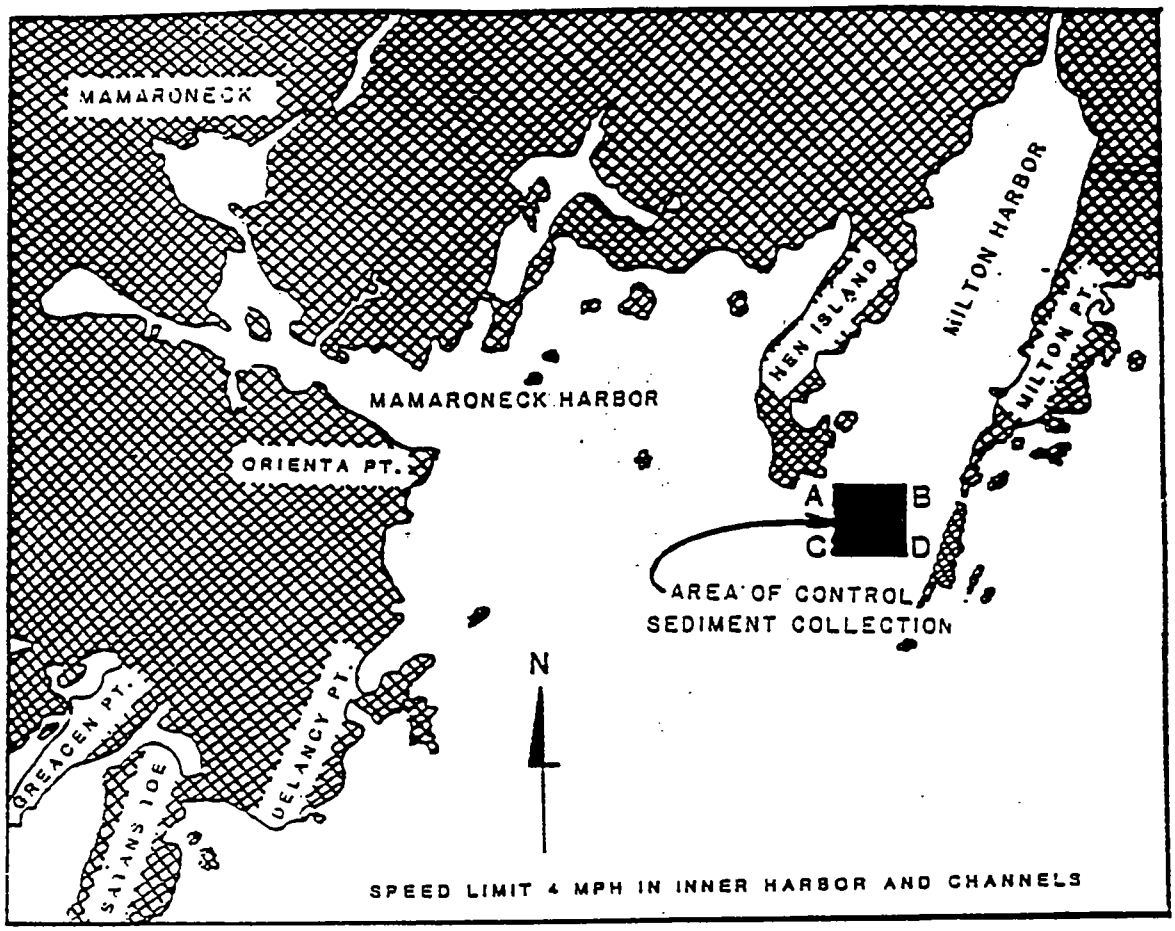
DRAWING NUMBER: BARGE PIER SOUNDING FIG. 1

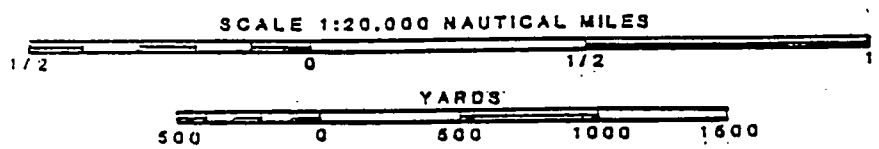
Figure 1

00003

Figure 2

Chart showing area for control sediment collection





CORNER	
A	73° 42' 19"
	40° 56' 17"
B	73° 42' 08"
	40° 56' 17"
C	73° 42' 19"
	40° 56' 08"
D	73° 42' 08"
	40° 56' 08"

MILTON HARBOR

RYE, NEW YORK

2. The following test associated services were provided:

   a. Proper chain-of-custody and QA/QC procedures were followed.

   b. Aqua Survey, Inc. was responsible for the health and safety of its personnel.

II. METHODOLOGY

A. Sediment Sampling

1. Test sediments were cored on December 20, February 4, and March 23 (Area 2 only) from the 10 sampling points at the site of the proposed dredging. Multiple sampling was performed to maintain proper holding times for sediments. Sampling points were numbered 1 - 10 (See Figure 1). Sediment samples were cored to project depth.

2. Control sediment was Petersen-dredged from Milton Harbor, New York in ACE designated area (See Figure 2).

3. Reference Sediment was dredged from ACE designated area off the New Jersey coast (Loran C Coordinates on 9960 X and Y are 26910.7, 43629.2).

4. Samples of sediment and site water were maintained at 4° +/- 2° C. Any opened containers of sediment were flushed with nitrogen prior to returning to storage.

B. Bioassay Procedures

1. Procedures for conducting the 28-Day Solid Phase Bioassay were developed at ASI in accordance with:

   a. Evaluation of Dredged Material Proposed for Ocean Disposal (Implementation Manual for Section 103 of the Public Law 92-532 [Marine Protection, Research and Sanctuaries Act of 1972], EPA-503/8-91/001 (February, 1991).

   b. 2,3,7,8-TCDD, 2,3,7,8-TCDF and PCBs in Marine Sediments and Biota:Laboratory and Field Studies, U.S. Environmental Protection Agency, Environmental Research Laboratory, Narrangansett, RI 02882. Final Report to U.S. Army Corps of Engineers, New York District, March 12, 1990.

   Procedures were approved by the USACOE.

C. Grain Size Procedures

1. Grain size analyses were performed in accordance with:

   Standard Method for Particle-Size Analysis of Soils
   ASTM Designation: D 422 - 63 (Reapproved 1972) American National Standard A37 145-1972 Approved March 2, 1972 by American National Standard Institute.

D. Test Organism

1. *Nereis virens* were obtained from Aquatic Research Organisms of Hampton, NH. They were shipped in moist seaweed and removed for testing immediately upon arrival at the laboratory.

III. RESULTS

A. Twenty-eight-Day Solid Phase Bioassay

A definitive count could only be made at the end of the exposure (672-hour). See Table 1.1 for the final live count. Experimental conditions during the bioassay are summarized in Tables 1.2 - 1.3.

Table 1.1

Results of the 28-day Solid Phase Bioassay. Testing was initiated with 20 *Nereis virens* per replicate.

Sample	Replicate	Final Live Counts
control	1	16
	2	19
	3	20
reference	1	19
	2	20
	3	18
	4	20
	5	20
area 1	1	20
	2	20
	3	19
	4	18
	5	18
area 2	1	19
	2	17
	3	20
	4	20
	5	19
area 3	1	19
	2	20
	3	19
	4	18
	5	19

Table 1.2

Chemical-physical data ranges during the 28-day exposure

Concentration	pH	Salinity (ppt)
Control 1-3	7.6 - 8.0	28.0 - 32.0
Reference 1-5	7.6 - 8.1	28.0 - 31.5
area 1 1-5	7.6 - 8.1	28.0 - 31.5
area 2 1-5	7.6 - 8.1	28.0 - 32.5
area 3 1-5	7.6 - 8.1	28.0 - 31.5

Table 1.3

Chemical-physical data ranges during the 28-day exposure

Concentration	Temperature (°C)	Dissolved Oxygen (ppm)
Control 1-3	19.5 - 23.0	5.8 - 7.5
Reference 1-5	19.5 - 23.0	5.9 - 7.5
area 1 1-5	19.5 - 23.0	6.1 - 7.4
area 2 1-5	19.5 - 23.0	5.4 - 7.4
area 3 1-5	19.5 - 23.5	5.2 - 7.4

B. Physical Testing

Grain size and water content determinations were made for control and reference sediment. Grain size distribution is defined by the following criteria:

Sand	< 0.0625 mm
Silt	< 0.0625 but > 0.0039 mm
Clay	< 0.0039 mm

The results of the physical testing are reported in Table 2.

Table 2.1

Results of Grain Size and Moisture Content Analyses.

	% Sand	% Silt	% Clay	% Moisture
Control	44.0	31.0	25.0	54.9
Reference	95.0	3.0	2.0	17.9

IV. SUMMARY

Solid Phase Bioassays

As detailed in Table 1.1, there was less than 10% control or reference organism mortality. Five percent mortality was observed in each of the test area sediments.

The limit for significance of results is ten percent mortality as set by the ACOE.

APPENDIX

AQUA SURVEY, INC
SOLID PHASE LIVE COUNTS

CLIENT: Exxon TEST START: 2-21-92 ORGANISM: N. virens

JOB NUMBER: 91-361 DEPURATION START:

SAMPLE ID	RP	INITIAL	FINAL	NOTES AND OBSERVATIONS
CONTROL	1	20	16	1 dead SG 2/26, 1 almost dead 3/4 SD, 1 dead 3/5, 1 almost dead 3/7 SD
	2	20	19	
	3	20	20	~~Labrea~~ 3/7 SD
REFERENCE	1	20	19	
	2	20	20	
	3	20	18	1 on surface, almost dead 3/7 SD, 1 dead 3/10
	4	20	20	
	5	20	20	
SAMPLE 1 Area 1	1	20	20	
	2	20	20	
	3	20	19	
	4	20	18	
	5	20	18	
SAMPLE 2 Area 2	1	20	19	
	2	20	17	1 almost dead on surface SG 2/26 - 1 dead SG 2/26
	3	20	20	
	4	20	20	
	5	20	19	
SAMPLE 3 Area 3	1	20	19	
	2	20	20	
	3	20	19	
	4	20	18	
	5	20	19	
SAMPLE 4	1			
	2			
	3	10		
	4			
	5			
SAMPLE 5	1			
	2			
	3	10		
	4			
	5			
INIT/QAQC	S	2/21 SD/SG	SD SG 3/20	

SP-LC

AC28A

AQUA SURVEY, INC
SOLID PHASE READINGS

~IENT: Exxon TEST START DATE: 2-21-92 TEST START TIME: _____ PARAMETER: pH

JANISM: N. virens JOB NUMBER: _____ METER NUMBER: _____

SAMPLE ID	REP	00	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CONTROL	1	7.7	7.7	7.9	7.8	7.8	7.7	7.6	7.9	7.6	7.9	7.7	7.7	7.9	7.8	7.7
	2	7.7	7.7	8.0	7.8	7.8	7.7	7.6	8.0	7.7	8.0	7.8	7.8	7.9	7.8	7.7
	3	7.7	7.7	8.0	7.8	7.8	7.7	7.6	8.0	7.7	8.0	7.8	7.7	7.9	7.8	7.7
REFERENCE	1	7.7	7.7	7.9	7.8	7.8	7.7	7.6	7.9	7.6	7.9	7.7	7.8	7.9	7.7	7.7
	2	7.9	7.7	7.9	7.9	7.8	7.7	7.6	8.0	7.8	7.9	7.8	7.8	7.8	7.8	7.6
	3	7.9	7.7	7.9	7.9	7.9	7.7	7.6	8.0	7.7	8.0	7.8	7.8	7.9	7.8	7.7
	4	8.0	7.7	8.0	7.9	7.9	7.7	7.6	8.0	7.8	8.0	7.8	7.8	7.8	7.8	7.8
	5	8.0	7.7	7.9	7.8	7.9	7.7	7.6	8.0	7.8	8.0	7.8	7.8	7.8	7.8	7.8
Area 1	1	8.0	7.6	7.8	7.8	7.8	7.7	7.6	8.0	7.8	7.9	7.9	7.8	7.9	7.8	7.9
	2	8.0	7.6	7.9	7.7	7.8	7.7	7.6	8.0	7.8	8.0	7.9	7.8	7.9	7.8	7.9
	3	8.1	7.6	7.9	7.8	7.9	7.7	7.6	8.0	7.8	8.0	7.9	7.8	7.9	7.8	7.9
	4	8.1	7.6	7.9	7.8	7.8	7.7	7.6	8.0	7.8	8.0	7.9	7.8	7.9	7.8	7.9
	5	8.1	7.6	7.8	7.7	7.8	7.7	7.6	7.9	7.8	7.9	7.9	7.8	7.9	7.8	7.9
Area 2	1	8.0	7.6	7.7	7.7	7.8	7.7	7.6	7.9	7.8	7.9	7.9	7.8	7.9	7.8	7.9
	2	8.0	7.6	7.7	7.7	7.7	7.6	7.6	7.8	7.8	8.0	7.9	7.8	8.0	7.9	7.9
	3	8.1	7.6	7.7	7.8	7.9	7.7	7.6	8.0	7.8	8.0	8.0	7.9	7.9	7.9	8.0
	4	8.0	7.6	7.7	7.7	7.8	7.7	7.6	8.0	7.8	8.0	7.9	7.8	7.9	7.8	8.0
	5	8.1	7.6	7.7	7.8	7.8	7.7	7.6	8.0	7.9	8.0	8.0	7.9	8.0	7.9	7.9
Area 3	1	8.1	7.6	7.7	7.7	7.8	7.7	7.6	7.8	7.8	7.9	7.8	7.8	7.8	7.8	7.8
	2	8.0	7.6	7.6	7.8	7.6	7.6	7.6	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
	3	8.1	7.6	7.6	7.6	7.8	7.7	7.6	7.9	7.8	8.0	7.8	7.8	7.8	7.8	7.8
	4	8.1	7.6	7.7	7.8	7.8	7.7	7.6	7.9	7.8	7.9	7.9	7.8	7.9	7.9	7.9
	5	8.0	7.6	7.6	7.7	7.8	7.7	7.6	7.9	7.8	7.9	7.8	7.8	7.9	7.9	7.9
	1															
	2															
	3															
	4															
	5															
QA/QC																
INITIALS		SAS SG 2/21	SG 2/23	KD 2/23	SD SG 2/24	SG 2/25	CG SG 2/26	SG 2/27	SG 2/28	SD 2/29	SG 3/1	SG 3/2	SG 3/5	SG 3/11	SG 3/3	SG 3/6

OBSERVATIONS @ 7.9 SG 2/28 MISTAKE

C288

AQUA SURVEY, INC
SOLID PHASE READINGS

NT: Exxon TEST START DATE: 2-21-92 TEST START TIME _____ PARAMETER: pH

ORGANISM: N. arenarius JOB NUMBER _____ METER NUMBER: _____

SAMPLE ID	RP	15	16	17	18	19	20	21	22	23	24	25	26	27	28	EXTRA
CONTROL	1	7.7	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.0	7.8	
	2	7.7	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.0	7.8	
	3	7.7	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.0	7.8	
REFERENCE	1	7.7	7.8	7.9	7.8	7.8	7.9	7.8	7.9	7.7	7.7	7.7	7.9	8.0	7.7	
	2	7.8	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.1	7.8	
	3	7.7	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.1	7.8	
	4	7.8	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.1	7.8	
	5	7.8	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.1	7.8	
Area 1	1	7.8	7.8	7.9	7.8	7.8	7.9	7.8	8.0	7.8	7.7	7.8	7.9	8.0	7.8	
	2	7.9	7.8	8.0	7.9	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.1	7.8	
	3	7.9	7.8	8.0	7.9	7.8	7.9	7.8	8.0	7.8	7.8	7.8	7.9	8.1	7.8	
	4	7.9	7.8	8.0	7.8	7.8	7.9	7.7	8.0	7.9	7.8	7.8	7.9	8.1	7.8	
	5	7.9	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.9	7.8	7.8	7.9	8.1	7.8	
Area 2	1	7.9	7.8	8.1	7.8	7.8	7.9	7.7	8.0	7.9	7.9	7.8	7.9	8.1	7.8	
	2	7.9	7.8	8.1	7.9	7.9	8.0	7.7	8.0	8.0	7.9	7.8	8.0	8.1	7.8	
	3	7.9	7.8	8.0	7.9	7.9	8.0	7.7	8.0	8.0	7.9	7.8	7.9	8.1	7.8	
	4	7.9	7.8	8.1	7.9	7.8	7.9	7.7	8.0	7.9	7.9	7.8	7.9	8.0	7.8	
	5	7.9	7.8	8.0	7.8	7.8	7.9	7.8	8.0	7.9	7.9	7.8	7.9	8.0	7.8	
Area 3	1	7.8	7.7	7.9	7.8	7.8	7.9	7.7	8.0	7.9	7.9	7.9	7.9	8.0	7.7	
	2	7.9	7.7	8.0	7.9	7.8	8.0	7.8	8.0	8.0	8.0	7.8	8.0	8.1	7.8	
	3	7.8	7.7	7.9	8.0	7.8	7.9	7.9	8.0	7.9	7.9	7.8	7.9	8.0	7.7	
	4	7.9	7.8	8.0	7.9	7.9	8.0	7.9	8.0	8.0	7.9	7.9	7.9	8.1	7.8	
	5	7.9	7.8	8.0	7.9	7.8	7.9	7.9	8.0	7.9	7.9	7.9	7.9	8.1	7.8	
	1															
	2															
	3				VOID											
	4															
	5															
QA/QC																
INITIALS		SW 3/7	CH 3/7	SG 3/9	SG 3/10	SG 3/11	SW 3/12	SG 3/13	SW 3/14	SG 3/15	SG 3/16	SG 3/17	DD SG 3/18	SG SG 3/19	SG SG 3/20	

OBSERVATIONS ① 7.8 SG 3/10

AC28A

AQUA SURVEY, INC
SOLID PHASE READINGS

CLIENT: Exxon TEST START DATE: 2-21-92 TEST START TIME: _____ PARAMETER: Salinity

ORGANISM: Nereis JOB NUMBER: _____ METER NUMBER: _____

SAMPLE ID	RP	00	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CONTROL	1	30.0	29.5	32.0	29.0	30.0	29.0	29.0	29.0	29.0	29.5	28.0	28.0	29.0	29.0	29.0
	2	30.0	29.0	32.0	29.0	30.0	29.0	29.0	28.5	29.5	29.0	28.0	28.0	29.0	29.0	29.0
	3	30.0	29.0	31.5	29.0	30.0	29.0	29.0	28.5	30.0	29.0	28.0	28.0	29.0	29.0	29.0
REFERENCE	1	30.0	29.0	31.5	29.0	30.0	28.5	29.0	28.5	29.0	29.5	28.0	28.0	29.0	29.0	29.0
	2	30.5	29.0	31.5	33.0	30.0	28.5	29.0	29.0	29.5	29.5	28.0	29.0	29.0	29.0	29.0
	3	31.0	29.0	31.5	30.0	30.0	28.5	29.0	29.0	29.5	29.5	28.0	28.0	29.0	29.0	29.0
	4	31.0	29.0	31.5	30.0	30.0	28.5	29.0	29.0	29.5	29.5	28.0	28.0	29.0	29.0	29.0
	5	31.0	29.0	31.5	29.5	30.0	28.5	29.0	29.0	29.5	29.5	28.0	28.0	29.0	29.0	29.0
Area 1	1	30.0	29.0	31.5	29.5	30.0	28.5	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
	2	30.0	29.0	31.5	29.5	30.0	28.5	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
	3	30.0	29.0	31.5	29.5	30.0	28.5	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
	4	30.0	29.0	31.5	29.5	30.0	28.5	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
	5	30.0	29.0	31.5	30.0	30.0	28.5	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
Area 2	1	30.0	29.0	31.5	32.0	30.0	28.5	29.0	29.0	30.0	29.5	28.0	28.5	28.5	29.0	29.0
	2	30.0	29.0	31.5	29.0	30.0	28.5	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
	3	30.0	29.0	31.5	29.5	30.0	28.5	29.0	29.0	29.5	29.5	28.0	28.0	29.0	29.0	29.0
	4	30.0	29.0	31.5	29.5	30.0	28.5	29.0	29.0	29.5	29.5	28.0	28.0	29.0	29.0	29.0
	5	30.0	29.0	31.5	32.5	30.0	28.5	29.0	29.0	29.5	29.5	28.0	28.0	29.0	29.0	29.0
Area 3	1	30.0	29.0	31.5	30.0	30.0	29.0	29.0	29.0	29.5	29.5	28.5	28.0	29.0	29.0	29.0
	2	30.5	29.0	31.5	30.0	30.0	29.0	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
	3	30.5	29.0	31.5	30.0	30.0	29.0	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
	4	31.0	29.0	31.5	30.0	30.0	29.0	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
	5	30.5	29.0	31.5	30.0	30.0	29.0	29.0	29.0	30.0	29.5	28.0	28.0	29.0	29.0	29.0
_____	1															
_____	2															
	3															
	4															
	5															
QA/QC																
INITIALS		2/21 SD	43	95	SD 4/24	SG 4/25	SG 4/26	SG 4/27	SG 4/28	SG 4/29	SG 3/1	SG 3/2	SG 3/3	SG 3/4	SG 3/5	SG 3/6

OBSERVATIONS _____

00014

C288

AQUA SURVEY, INC
SOLID PHASE READINGS

NT: Exxon TEST START DATE: 2-21-92 TEST START TIME _____ PARAMETER: SALINITY

ORGANISM: N. arenarius JOB NUMBER _____ METER NUMBER: _____

SAMPLE ID	RP	15	16	17	18	19	20	21	22	23	24	25	26	27	28	EXTRA
CONTROL	1	30.0	30.5	30.0	29.5	29.5	29.0	31.0	30.0	31.0	29.0	28.0	29.0	28.0	29.0	
	2	30.0	30.0	30.0	29.5	29.0	29.0	31.0	29.5	31.0	28.5	28.0	29.0	28.0	28.0	
	3	30.0	30.0	30.0	29.5	29.0	29.0	31.0	30.0	31.0	28.5	28.5	29.0	28.0	28.0	
REFERENCE	1	30.0	30.0	30.0	29.5	29.5	29.0	31.0	30.0	31.0	29.0	28.5	29.0	28.0	28.5	
	2	30.0	30.0	30.0	29.5	29.5	29.0	31.0	30.0	31.0	29.0	28.5	29.0	28.0	28.5	
	3	30.0	30.0	30.0	30.0	29.0	29.0	31.0	30.0	31.0	29.0	28.5	29.0	28.0	28.5	
	4	30.0	30.0	30.0	30.0	29.0	29.0	31.0	30.0	31.0	29.0	28.5	29.0	28.0	28.5	
	5	30.0	30.0	30.0	30.0	29.0	29.0	31.0	30.0	31.0	29.0	28.5	29.0	28.0	28.5	
Area 1	1	30.0	30.0	30.0	30.0	29.0	29.0	31.5	30.0	31.0	29.0	29.0	29.0	28.0	29.0	
	2	30.0	30.0	30.0	30.0	29.5	29.5	31.5	30.0	31.0	29.0	29.0	29.0	28.0	29.0	
	3	30.0	30.0	30.0	30.0	29.5	29.5	31.5	30.0	31.0	29.0	29.0	29.0	28.0	29.0	
	4	30.0	30.0	30.0	30.0	29.5	29.5	31.0	30.0	31.0	29.0	29.0	29.0	28.0	28.5	
	5	30.0	30.0	30.0	30.0	29.5	29.0	31.0	30.0	30.5	29.0	29.0	29.0	28.0	29.0	
Area 2	1	30.0	30.0	30.0	29.5	29.5	29.0	31.0	29.5	30.5	28.5	28.5	29.0	28.0	28.5	
	2	30.0	30.0	30.0	29.5	29.5	29.0	31.0	29.5	30.5	28.5	28.0	29.0	28.0	28.5	
	3	30.0	30.0	30.0	29.5	29.5	29.0	31.0	29.5	31.0	28.5	28.0	29.0	28.0	28.0	
	4	30.0	30.0	30.0	29.5	29.5	29.0	31.0	30.0	31.0	28.5	28.0	29.0	28.0	28.5	
	5	30.5	30.0	30.0	30.0	29.5	29.0	31.0	30.0	31.0	28.5	28.5	29.0	28.0	28.5	
Area 3	1	31.0	30.5	30.0	29.5	29.5	29.0	31.0	30.0	31.0	28.5	28.5	29.0	28.0	28.5	
	2	31.0	30.5	30.0	28.5	29.5	29.0	31.0	30.0	31.0	29.0	28.5	29.5	28.0	29.0	
	3	31.0	30.5	30.0	29.5	29.5	29.0	31.5	30.0	31.0	29.0	28.5	29.5	28.0	29.0	
	4	31.0	30.5	30.0	29.5	29.5	29.0	31.5	30.0	31.0	29.0	28.5	29.5	28.0	29.0	
	5	31.0	30.5	30.0	29.5	29.5	29.5	31.5	30.0	31.0	29.0	28.5	30.0	28.0	29.0	
	1															
	2															
	3						10:0									
	4															
	5															
QA/QC																
INITIALS		KM 2/7	KM 2/7	SG 2/9	SG 2/10	SG 2/11	SG 2/12	SG 2/13	DM 2/14	SG 2/15	SG 2/16	SG 2/17	BE 2/18	ES 2/19	BD 2/20	

OBSERVATIONS _____

00015

AC28A

AQUA SURVEY, INC
SOLID PHASE READINGS

CLIENT: Exxon TEST START DATE: 2-21-92 TEST START TIME: ____ PARAMETER: Temp

ANISM: N. virens JOB NUMBER: _____ METER NUMBER: _____

SAMPLE ID	RP	00	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CONTROL	1	22.0	21.0	21.0	21.5	20.5	21.0	20.5	20.0	20.0	21.0	20.5	20.5	20.5	20.5	20.5
	2	22.0	21.0	21.0	21.0	20.5	20.5	20.5	20.0	20.5	21.0	20.0	20.0	20.5	20.5	20.5
	3	22.0	21.0	21.5	21.0	20.5	20.5	20.5	20.0	20.5	20.0	20.0	20.0	20.5	20.5	20.0
REFERENCE	1	22.0	21.0	21.5	21.0	20.5	20.5	20.5	20.0	20.5	21.0	20.0	20.5	20.5	20.5	20.0
	2	21.5	20.5	21.5	21.5	20.5	20.5	20.5	20.0	19.5	21.0	20.0	20.0	20.5	20.5	20.0
	3	22.0	21.0	21.5	21.5	20.5	20.5	20.5	20.0	20.5	21.0	20.0	20.0	20.5	20.5	20.0
	4	22.0	20.5	21.5	21.0	20.5	20.5	20.5	20.0	20.0	21.0	20.0	20.0	20.5	20.5	20.5
	5	22.0	20.5	21.5	21.0	20.5	20.5	20.5	20.0	20.5	21.0	20.0	20.0	20.5	20.5	20.5
Area 1	1	22.0	21.0	21.5	21.0	20.5	20.5	20.5	20.0	20.5	21.0	20.0	20.0	20.5	20.5	20.5
	2	21.5	21.0	21.5	21.0	20.5	20.5	20.5	20.0	20.5	21.0	20.0	20.0	20.5	20.5	20.5
	3	21.5	21.0	21.5	21.5	20.5	20.5	20.5	20.0	20.5	21.0	20.0	19.5	20.5	20.5	20.5
	4	21.5	20.5	21.0	21.5	20.5	20.5	20.5	20.0	20.0	21.0	20.0	20.0	20.5	20.5	20.5
	5	21.5	21.5	21.0	21.0	20.5	20.5	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.5	20.5
Area 2	1	21.5	21.0	21.5	21.0	20.5	20.5	20.5	20.0	19.5	20.5	20.0	20.0	20.5	20.5	20.0
	2	21.0	21.0	21.5	21.0	20.5	20.5	20.5	20.0	19.5	20.5	20.0	20.0	20.0	20.0	20.0
	3	21.0	21.0	21.5	21.0	20.5	20.5	20.5	7.5	20.0	20.5	19.5	19.5	20.0	20.0	20.0
	4	21.0	21.0	21.5	21.0	20.5	20.5	20.5	19.5	20.0	20.5	19.5	19.5	20.0	20.0	20.0
	5	21.0	21.0	21.5	21.5	20.5	20.5	20.5	20.0	20.0	21.0	20.0	20.0	20.0	20.5	20.5
Area 3	1	22.0	21.0	21.5	21.5	21.0	21.0	20.5	20.0	20.0	21.0	20.5	20.0	20.5	20.5	20.5
	2	22.0	21.0	21.5	21.5	21.0	21.0	20.5	20.0	20.0	21.0	20.5	20.0	20.5	20.5	20.5
	3	22.0	21.0	21.0	21.0	21.0	21.0	20.5	20.0	20.5	21.0	20.5	20.0	20.5	20.5	20.5
	4	22.0	21.0	21.0	21.5	21.0	21.0	20.5	20.0	20.5	21.0	20.5	20.0	20.5	20.5	20.5
	5	22.0	21.0	21.0	21.5	21.0	21.0	20.5	20.0	20.5	21.0	20.5	20.5	20.5	20.5	20.5
_____	1															
_____	2															
	3															
	4															
	5															
QA/QC																
INITIALS		SG 2/21	SG 2/22	SG 2/23	JP SG 2/24	SG 2/25	SG, 2/26	SG 2/27	SG 2/28	JN 2/29	JN 3/1	SG 3/2	SG 3/3	SG 3/4	SG 3/5	SG 3/6

OBSERVATIONS 1: 22.0 SG 2/21@7

00016

AC288

AQUA SURVEY, INC
SOLID PHASE READINGS

CLIENT: Exxon TEST START DATE: 2-21-92 TEST START TIME _____ PARAMETER: TEMPERATURE

IISH: Nelson JOB NUMBER _____ METER NUMBER: _____

SAMPLE ID	RP	15	16	17	18	19	20	21	22	23	24	25	26	27	28	EXTRA
CONTROL	1	20.5	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	20.5	20.5	20.0	20.5	
	2	20.0	20.5	23.0	20.5	20.5	20.0	20.5	20.5	19.5	20.5	20.5	20.5	20.0	20.0	
	3	20.0	20.5	23.0	20.5	20.5	20.0	20.5	20.5	19.5	20.5	20.5	20.0	20.0	20.0	
REFERENCE	1	20.0	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	20.5	20.5	20.5	20.5	
	2	20.0	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	20.5	20.5	20.5	20.0	
	3	20.0	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	20.5	20.5	20.5	20.5	
	4	20.0	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	20.5	20.5	20.5	20.5	
	5	20.0	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	20.5	20.5	20.5	20.5	
Area 1	1	20.0	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	20.5	20.5	20.5	20.5	
	2	20.0	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	20.5	20.5	20.5	20.5	
	3	20.0	20.5	23.0	21.0	20.5	21.0	20.5	20.5	20.0	20.5	21.0	20.5	20.5	20.5	
	4	20.0	20.5	23.0	20.5	20.5	20.5	20.5	20.5	20.0	20.5	21.0	20.5	20.5	20.5	
	5	20.5	20.5	23.0	20.5	20.5	20.0	20.0	20.0	20.0	20.5	20.5	20.0	20.5	20.0	
Area 2	1	20.0	20.5	23.0	20.5	20.5	20.0	20.0	20.0	19.5	20.0	20.0	19.5	20.0	20.0	
	2	20.0	20.5	22.5	20.0	20.0	20.0	20.0	20.0	19.5	20.0	20.0	20.0	20.0	19.5	
	3	19.5	20.5	22.5	20.0	20.0	20.0	20.0	20.0	19.5	20.0	20.0	20.0	20.0	19.5	
	4	19.5	20.5	22.5	20.0	20.0	20.0	20.0	20.0	19.5	20.0	20.0	20.0	20.5	19.5	
	5	20.0	20.5	22.5	20.0	20.5	20.0	20.0	20.0	19.5	20.0	20.0	20.0	20.5	19.5	
Area 3	1	20.5	20.5	23.5	20.0	20.5	20.0	20.0	20.5	19.5	20.0	20.0	21.0	21.0	20.0	
	2	20.5	20.5	20.0	20.0	20.5	20.5	20.0	20.5	20.0	20.0	20.0	20.5	21.0	20.0	
	3	20.5	20.5	23.0	20.0	20.0	20.5	20.5	20.5	20.0	20.5	20.5	20.5	21.0	20.0	
	4	21.0	20.5	23.0	20.0	20.0	20.5	20.5	20.5	20.0	20.5	20.5	20.5	21.0	20.0	
	5	21.0	20.5	23.0	20.0	20.0	20.5	20.5	20.5	20.0	20.5	20.5	21.0	21.0	20.5	
	1															
	2															
	3				10.0											
	4															
	5															
QA/QC																
INITIALS		3/11		SG 3/9	SG 3/10	SG 3/11	SG 3/12	SG 3/13	SG 3/14	SG 3/15	SG 3/16	SG 3/17	SG 3/18	SG 3/19	SG 3/20	

OBSERVATIONS _____

00017

AC28A

AQUA SURVEY, INC
SOLID PHASE READINGS

CLIENT: Exxon TEST START DATE: 2-21-92 TEST START TIME: ____ PARAMETER: D.O.

ORGANISM: N. virens JOB NUMBER: ____ METER NUMBER: ____

SAMPLE ID	RP	00	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CONTROL	1	6.4	5.9	5.8	6.6	6.7	7.0	7.0	7.0	7.2	7.0	7.2	7.0	7.0	7.2	7.2
	2	6.4	6.1	6.1	6.7	6.8	7.0	7.0	7.2	7.4	7.2	7.0	7.0	7.0	7.1	7.2
	3	6.6	6.2	6.2	6.8	6.8	7.0	7.0	7.2	7.4	7.2	7.2	7.0	7.1	7.1	7.2
REFERENCE	1	6.8	6.4	5.9	6.8	6.9	7.4	7.0	7.2	7.4	7.2	7.2	7.0	7.1	7.2	7.2
	2	6.8	6.4	6.1	6.8	6.8	7.4	7.0	7.2	7.4	7.2	7.2	6.9	7.1	7.1	7.2
	3	6.8	6.4	6.2	6.8	6.8	7.4	7.0	7.2	7.4	7.2	7.2	7.1	7.2	7.2	7.3
	4	6.8	6.3	6.2	6.9	6.9	7.4	7.0	7.2	7.5	7.2	7.2	7.1	7.2	7.2	7.3
	5	6.8	6.4	6.2	6.8	6.9	7.4	7.0	7.2	7.5	7.2	7.2	7.1	7.2	7.2	7.3
Area 1	1	6.7	6.4	6.1	6.8	6.8	7.4	7.0	7.1	7.4	7.0	7.2	7.1	7.1	7.1	7.2
	2	6.6	6.2	6.2	6.6	6.8	7.4	7.0	7.0	7.2	7.0	7.1	7.0	7.0	7.1	7.2
	3	6.6	6.1	6.2	6.6	6.8	7.4	6.8	7.0	7.2	7.0	7.0	7.0	7.0	7.0	7.1
	4	6.6	6.3	6.2	6.6	6.8	7.4	6.8	7.0	7.2	7.0	7.0	7.0	7.0	7.0	7.1
	5	6.6	6.3	6.0	6.6	6.8	7.4	6.8	7.1	7.2	6.9	7.1	7.0	7.0	7.0	7.2
Area 2	1	6.6	6.4	5.9	6.4	6.4	7.2	7.0	7.0	7.0	6.8	7.2	7.0	7.0	6.8	7.0
	2	6.6	6.4	5.8	6.2	6.4	7.4	6.8	5.4	7.2	7.0	7.0	6.6	6.8	6.8	7.0
	3	6.7	6.4	6.2	6.6	6.7	7.2	6.8	6.8	7.4	7.1	7.1	7.1	7.0	7.0	7.0
	4	6.6	6.1	6.0	6.3	6.8	7.2	6.6	7.0	7.2	6.9	7.1	7.0	7.1	7.0	7.0
	5	6.6	6.4	5.8	6.4	6.8	7.4	6.8	7.0	7.0	6.8	7.0	7.0	7.0	6.8	7.0
Area 3	1	6.6	6.4	6.1	6.4	6.4	7.4	7.0	7.0	7.2	6.8	7.0	6.8	6.8	6.8	7.0
	2	6.6	6.3	6.2	5.2	5.6	7.4	7.0	6.0	6.3	7.0	6.9	6.8	6.8	6.8	7.0
	3	6.6	6.4	6.1	6.1	6.2	7.2	7.0	6.6	6.5	6.5	6.8	6.9	6.5	6.7	6.8
	4	6.6	6.3	6.2	6.4	6.4	7.2	6.8	6.8	7.0	6.9	6.9	6.7	6.7	6.8	6.8
	5	6.6	6.3	5.8	6.3	6.5	7.4	7.0	6.8	6.8	6.9	6.8	6.8	6.8	6.8	7.0
____	1															
____	2															
	3															
	4															
	5															
QA/QC																
INITIALS		SK 2/21	SG 2/21	SG 2/23	SG 2/24	SG 2/25	SG 2/26	SG 2/27	SG 2/28	SG 3/2	SG 3/1	SG 3/2	SG 3/3	SG 3/4	SG 3/5	SG 3/6

OBSERVATIONS ____

00018

AC288

AQUA SURVEY, INC
SOLID PHASE READINGS

NT: Exxon TEST START DATE: 2-21-92 TEST START TIME _____ PARAMETER: D.O.

ORGANISM: N. [illegible] JOB NUMBER _____ METER NUMBER: _____

SAMPLE ID	RP	15	16	17	18	19	20	21	22	23	24	25	26	27	28	EXTRA
CONTROL	1	7.2	7.2	6.8	7.0	7.1	7.2	7.4	6.6	7.3	7.5	7.3	7.2	7.0	7.3	
	2	7.2	7.2	6.7	7.0	7.1	7.2	7.4	6.7	7.3	7.4	7.3	7.2	7.0	7.3	
	3	7.2	7.2	6.8	7.0	7.1	7.2	7.4	6.8	7.4	7.5	7.2	7.2	7.0	7.3	
REFERENCE	1	7.2	7.2	6.8	7.0	7.1	7.2	7.4	6.7	7.4	7.4	7.2	7.2	7.0	7.3	
	2	7.2	7.2	6.8	7.0	7.1	7.2	7.4	6.6	7.3	7.4	7.2	7.1	7.0	7.2	
	3	7.2	7.2	6.8	7.0	7.2	7.2	7.4	6.8	7.4	7.4	7.2	7.2	7.0	7.3	
	4	7.3	7.2	6.8	7.1	7.2	7.2	7.4	6.8	7.4	7.5	7.2	7.2	7.0	7.3	
	5	7.3	7.2	6.8	7.1	7.2	7.2	7.4	6.8	7.4	7.5	7.3	7.2	7.1	7.3	
Area 1	1	7.2	7.2	6.8	7.0	7.1	7.2	7.4	6.8	7.4	7.4	7.2	7.2	7.0	7.3	
	2	7.2	7.2	6.8	7.0	7.1	7.2	7.4	6.7	7.4	7.4	7.2	7.1	7.0	7.2	
	3	7.2	7.2	6.8	7.0	7.1	7.2	7.4	6.6	7.2	7.4	7.2	7.0	7.0	7.2	
	4	7.2	7.2	6.7	7.0	7.1	7.2	7.4	6.7	7.2	7.4	7.2	7.0	7.0	7.2	
	5	7.2	7.2	6.8	7.0	7.1	7.2	7.4	6.6	7.4	7.4	7.2	7.1	7.0	7.2	
Area 2	1	6.9	7.2	6.8	7.0	7.1	7.2	7.4	6.8	7.2	7.4	7.2	7.0	6.9	7.2	
	2	6.9	7.2	6.6	6.9	7.1	7.2	7.4	6.6	7.2	7.4	7.2	7.0	7.0	7.2	
	3	7.1	7.0	[illegible]	7.0	7.1	7.2	7.4	6.8	7.2	7.4	7.2	7.1	7.0	7.2	
	4	7.0	7.0	6.6	7.0	7.0	7.2	7.4	6.6	7.2	7.4	7.2	7.1	7.0	7.2	
	5	6.9	7.0	6.6	6.8	7.1	7.2	7.0	6.6	7.2	7.4	7.2	7.0	7.0	7.2	
Area 3	1	6.7	7.0	6.2	6.8	6.8	6.8	7.3	6.2	6.8	7.0	6.8	6.6	6.6	6.8	
	2	6.9	7.2	6.6	6.7	6.8	7.1	6.8	6.6	6.9	7.1	6.8	7.0	6.9	7.0	
	3	6.8	7.0	6.0	6.8	6.6	7.0	7.0	6.4	6.9	7.0	6.7	6.4	6.8	6.8	
	4	6.8	7.0	6.4	6.7	6.8	7.0	7.0	6.4	6.9	7.0	6.8	6.8	6.8	7.0	
	5	6.9	7.0	6.5	6.8	7.0	7.0	7.1	6.4	7.0	7.2	6.8	6.9	6.9	7.1	
	1															
	2															
	3			void												
	4															
	5															
QA/QC																
INITIALS		[illegible]	[illegible]	[illegible] 3/9	[illegible] 3/10	[illegible] 3/11	[illegible] 3/12	[illegible] 3/13	[illegible] 3/14	[illegible] 3/15	[illegible] 3/16	[illegible] 3/17	[illegible] 3/18	[illegible] 3/19	[illegible] 3/20	

ERVATIONS @ 6.8 SG 3/9

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 2.21.92 QA/QC: _____

TEST JOB #: 92-913601 CLIENT: NUTEST / EXXON BAWAY

IN-LAB [✓] MOBILE [ ] SATELLITE [ ]

TEST SPECIES: N. VIRENS

Total Number of organisms acclimated: 520

AQUA SURVEY, INC Investigators: JM

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: — / 92-0125
2. Procured From/Date Received: 92-0029 ARO 2/19/92
3. Age Information: MIXED ADULTS

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 12.5°C
2. Salinity: VOID
3. Alkalinity: VOID

C. HOLDING [ ] CULTURE [ ] WATER PARAMETERS

1. Temperature: _____
2. Salinity: _____ VOID
3. Alkalinity: _____
4. Water Source: _____

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): _____
2. Acclimation Water Type: _____
3. Acclimation Water Temperature: _____
4. Acclimation Water Salinity: VOID _____
5. Acclimation Commencement - Date: _____ Time: _____
6. Change-Over Rate (ml/minute): _____
7. Culture Acclimation Ending-Date: _____ Time: _____
8. _____ Acclimation Ending-Date: _____ Time: _____

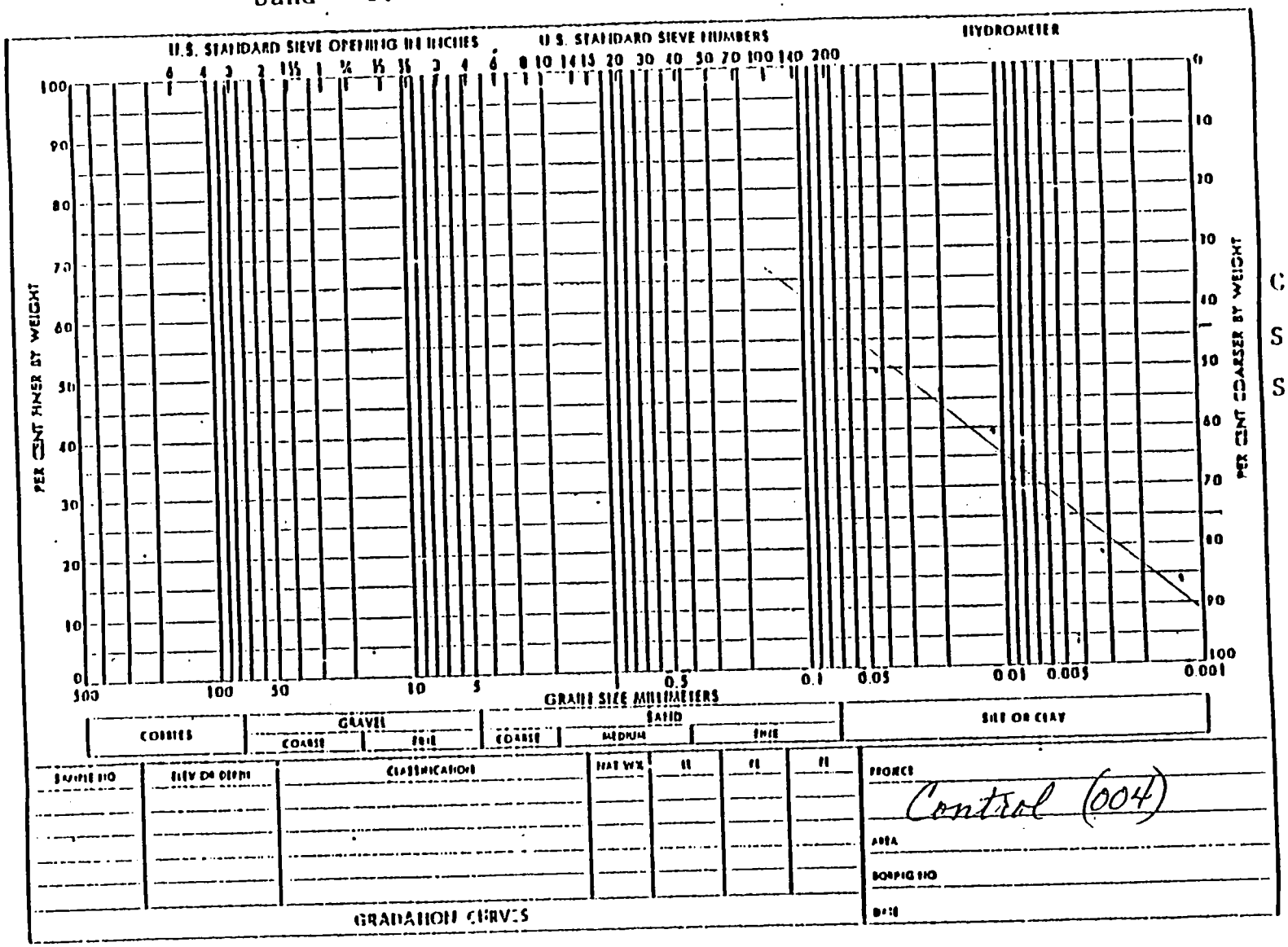
E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 2/21/92 Time: 1100 HRS
2. Temperature: 12.5°C
3. Salinity: VOID
4. Alkalinity: VOID
5. Culture Lab Technician Initials: JM/DR [Transfer]
6. Test Lab Technician Initials: CC [Receiving]

REMARKS: 28 day Solid PHASE

00020

Sand ≥ 0.0625 0.0039 < Silt < 0.0625 Clay ≥ 0.0039



Clay- 25%
Silt- 31%
Sand- 44%

Report Date: 03/05/92

Page: 1

Date: 03/03/92
Total # of Samples: 1
Date: Control #004

Dispersant Correction: 3.0
Number of Entries: 7

Temperature: 21.000
Specific Gravity: 2.650

K Constant: 0.01348

Samples #: 1

Grams Used: 50.00

Hydroscopic Moisture Factor $\left|\frac{f}{m}\right|$: 0.97000

Clock Time	Elapse Time (T)	Hydrometer Reading $\left\|\frac{R}{h}\right\|$	Effective Depth (L)	Percent Suspend (%)	Grain Size (mm) (GS mm.)
09:02am	2.0	27.00	11.90	49.484536	0.0328813
09:05am	5.0	26.00	12.00	47.422680	0.0208831
09:15am	15.0	22.00	12.70	39.175258	0.0124036
09:30am	30.0	18.00	13.30	30.927835	0.0089754
10:00am	60.0	15.00	13.80	24.742268	0.0064648
01:10pm	250.0	12.00	14.30	18.556701	0.0032239
09:00am	1440.0	10.00	14.70	14.432990	0.0013620

Master

Client: Control Job #: _____

Sample #	Pan Weight	Pan Weight & Wet Sed.	Pan Weight & Air Dry	Percent Moisture	Pan Weight & Oven Dry	Hygroscopic Moisture	HMCF **	Grams used for sed.
#001 5-30-91	1.088	34.534	16.459	54.04	16.071		0.98	
#002 9-28-91	1.153	30.595	10.282	68.17	10.339		0.98	
#003 11-20-91	1.520	54.765	22.577	60.45	22.001		0.97	
#004 3-3-92	1.542	47.588	22.296	54.93	21.657		0.97	

** Percent Moisture = $\frac{\text{(Wet sample \& dish) - (Dry sample \& dish)}}{\text{(Wet sample \& dish) - dish}} \times 100$

Hygroscopic Moisture Correction Factor = oven dried / air dried

Date: _____ Site: _____

Dispersant: correction: 4

Sample # #001 Grams used: 50 f _____ M

5-30-91 D.S. Cor 1

Clock Time	T	R h	L	%	GS mm.
9:02	2	26			
9:05	5	24			
9:15	15	22			
9:30	30	20			
10:00	60	17			
1:16	250	14			
9:00	1440	11			

Sample # 004 Grams used: 50 f _____ M

3-3-92 D.S. Cor 3

Clock Time	T	R h	L	%	GS mm.
9:02	2	27			
9:05	5	26			
9:15	15	22			
9:30	30	18			
10:00	60	15			
1:16	250	12			
9:00	1440	10			

Sample # 002 Grams used: 50 f _____ M

9-24-91 D.S. Cor 2

Clock Time	T	R h	L	%	GS mm.
9:02	2	31			
9:05	5	35			
9:15	15	29			
9:30	30	24			
10:00	60	19			
1:16	250	15			
9:00	1440	7.4			

Sample # _____ Grams used: _____ f _____ M

Clock Time	T	R h	L	%	GS mm.
	2				
	5				
	15				
	30				
	60				
	250				
	1440				

Sample # #003 Grams used: 50 f _____ M

11/5/92 D.S. Cor 4

Clock Time	T	R h	L	%	GS mm.
9:02	2	34			
9:05	5	29			
9:15	15	25			
9:30	30	22			
10:00	60	18			
1:16	250	13			
9:00	1440	10			

T - Time in minutes after initial mixing

f - Hygroscopic Moisture Factor
M

R - Hygrometer Reading
h

L - Effective Depth, derived from table #2

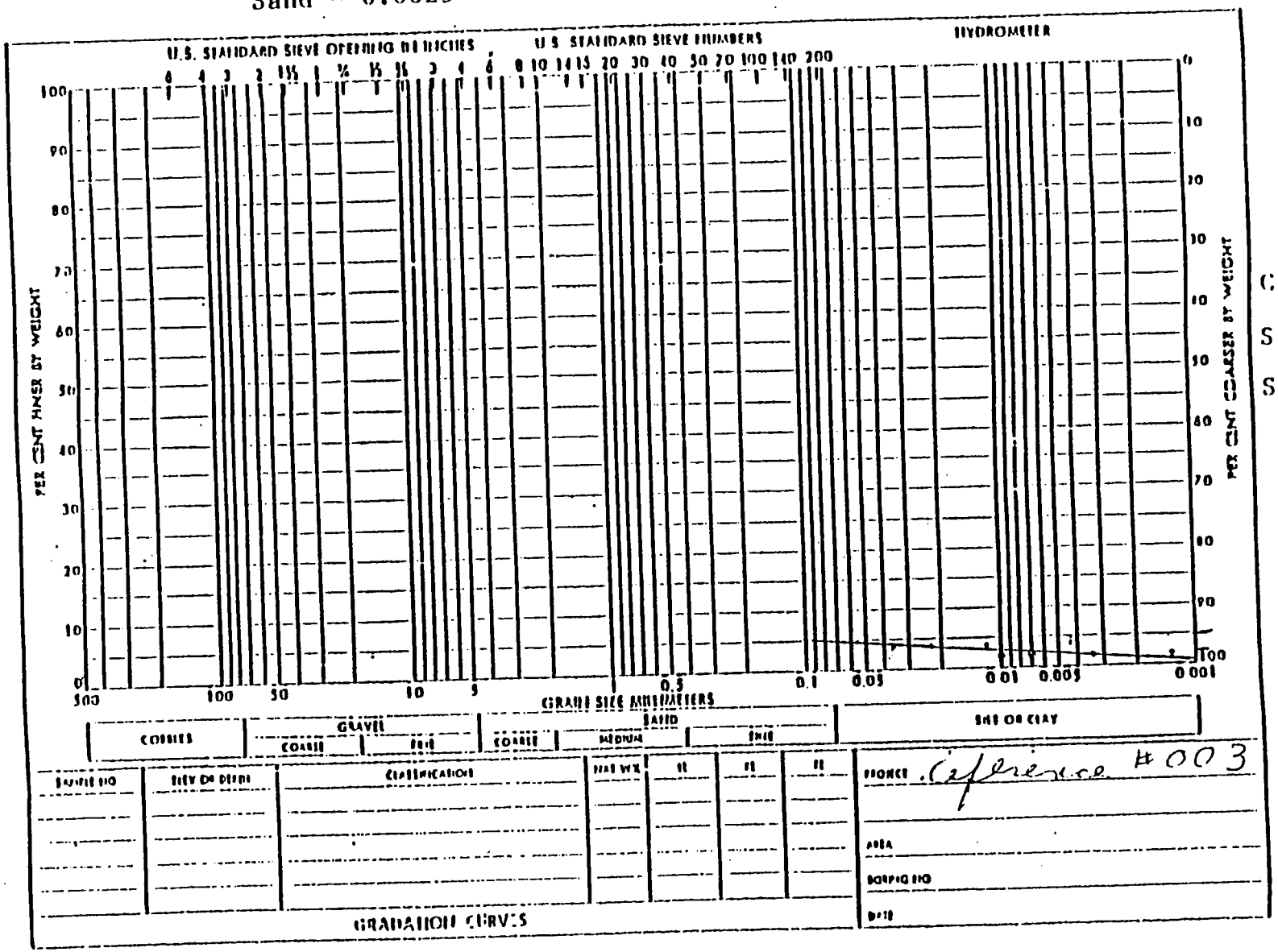
% - % suspended (prog. #1): input f, then each R
M h

GS - Grain Size (prog. #2): input T and L

Master Copy - 1

D.B. Nichols Cylinder 9/25/91 DBN

Sand ≥ 0.0625 0.0039 < Silt < 0.0625 Clay ≥ 0.0039



Clay- 2%

Silt- 3%

Sand- 95%

00025

Report Date: 03/05/92

Date: 03/03/92
Total # of Samples: 1
Site: Reference #003

Dispersant Correction: 3.000
Number of Entries: 7

Temperature: 21.000
Specific Gravity: 2.650

K Constant: 0.01348

Samples #: 1 Grams Used: 50.00

Hydroscopic Moisture Factor $\left|\frac{f}{m}\right|$: 1.00000

Clock Time	Elapse Time (T)	Hydrometer Reading $\left\|\frac{R}{h}\right\|$	Effective Depth (L)	Percent Suspend (%)	Grain Size (mm) (GS mm.)
09:06am	2.0	5.00	15.50	4.000000	0.0375267
09:09am	5.0	5.00	15.50	4.000000	0.0237340
09:19am	15.0	5.00	15.50	4.000000	0.0137028
09:34am	30.0	4.00	15.60	2.000000	0.0097206
10:04am	60.0	4.00	15.60	2.000000	0.0068735
01:14pm	250.0	4.00	15.60	2.000000	0.0033673
09:04am	1440.0	4.00	15.60	2.000000	0.0014030

Master

Client: Reference Job #: _____

Sample #	Pan Weight	Pan Weight & Wet Sed.	Pan Weight & Air Dry	Percent Moisture	Pan Weight & Oven Dry	Hygroscopic Moisture	HMCF ¤	Grams used for sed.
#001 5-8-91	1.099	35.172	28.732	18.90	28.646		1.00	
#002 11/20/91	1.5352	67.6054	55.324	18.59	55.156		1.00	
#003 3-3-92	1.549	61.891	51.098	17.89	50.916		1.00	

¤ Percent Moisture = $\frac{\text{(Wet sample \& dish) - (Dry sample \& dish)}}{\text{(Wet sample \& dish) - dish}} \times 100$

Hygroscopic Moisture Correction Factor = oven dried / air dried

Date: _____ Site: _____

Dispersant: correction: 4

Sample # 001 Grams used: 50 f _____ M

5-8-91 Dis. cor

Clock Time	T	R h	L	%	GS mm.
9:06	2	6			
9:09	5	5			
9:19	15	5			
9:34	30	5			
10:04	60	5			
1:20	250	5			
9:04	1440	5			

Sample # _____ Grams used: _____ f _____ M

Clock Time	T	R h	L	%	GS mm.
	2				
	5				
	15				
	30				
	60				
	250				
	1440				

Sample # 002 Grams used: 50 f 1.60 M

1-3-92 Dis Cor 4

Clock Time	T	R h	L	%	GS mm.
9:06	2	7			
9:09	5	6			
9:19	15	5			
9:34	30	5			
10:04	60	4			
1:20	250	4			
9:04	1440	5			

Sample # _____ Grams used: _____ f _____ M

Clock Time	T	R h	L	%	GS mm.
	2				
	5				
	15				
	30				
	60				
	250				
	1440				

Sample # 003 Grams used: 50 f _____ M

3-3-92 Dis Cor 3

Clock Time	T	R h	L	%	GS mm.
9:06	2	5			
9:09	5	5			
9:19	15	5			
9:34	30	4			
10:04	60	4			
1:14	250	4			
9:04	1440	4			

T - Time in minutes after initial mixing

f - Hygroscopic Moisture Factor
M

R - Hydrometer Reading
h

L - Effective Depth, derived from table #2

% - % suspended (prog. #1): input f , then each R
M h

GS - Grain Size (prog. #2): input T and L

00028

CHAIN OF CUSTODY RECORD

FACILITY/LOCATION: EXXON Refinery - Bayway / LINDEN NJ	METHOD OF SHIPMENT: TO AS; FROM EXXON
SAMPLING AND ANALYSES AUTHORIZED BY:	DATE:

SAMPLE #	SAMPLING LOCATION AND DESCRIPTION	DATE	TIME	SAMPLE TYPE C	SAMPLE TYPE G	SAMPLE TYPE SOLID	# OF CONT.	ANALYSES REQUIRED
1	Mud From Core 1	12/30/91	1147		✓	Mud - Thick Black	2) 4 Gram Pails	SOLID
2	" " " 2	"	0855		✓	"	"	
3	" " " 3	"	1031		✓	"	"	PHASE
4	" " " 4	"	1120		✓	"	"	
5	" " " 5	"	1052		✓	All Sample Jars	1) 5 Gram Pail	BIOACCUMULATION
6	" " " 6	"	1110		✓	"	1) 5 Gram Pail	&
7	" " " 7	"	1220		✓	"	2 4 Gram Pails	AS PER
8	" " " 8	"	1430		✓	"	2 4 Gram Pails	CONTRACT
9	" " " 9	"	1539		✓		"	

SAMPLE COLLECTED BY: A.M. or R.V. Wolford	EXACT SAMPLING LOCATION: See Site Map		
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY: [signature]	DATE 12/30/91	TIME 1830
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME

SAMPLE RELINQUISHED AFTER ANALYSES:	ANALYZED SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE DESCRIPTION:	# OF CONTAINERS:		

FORM № 2834

AQUA SURVEY, INC.

CHAIN OF CUSTODY RECORD

FACILITY/LOCATION: EXXON BAY MAT LINDEN NJ	METHOD OF SHIPMENT: TO AS, FROM EXXON
SAMPLING AND ANALYSES AUTHORIZED BY:	DATE:

SAMPLE #	SAMPLING LOCATION AND DESCRIPTION	DATE	TIME	SAMPLE TYPE C	SAMPLE TYPE G	SAMPLE TYPE SOLID	# OF CONT.	ANALYSES REQUIRED
10	MUD FROM CORE #10	1/22/91	1459		✓	MUD	2 4 GALLON	96 HR
		"			✓	FROM CORES		BIOASSAY LATION
11A/B	SITE H20 - AREA 1	"	1600		✓	CORES	2 5 GALLON	AS
12A/B	" " " 2	"	1610		✓	SITE	"	PAK
13/14	" " " 3	"	1620		✓	H20	"	CONTRACT

SAMPLE COLLECTED BY: JOM OR RV WALTON	EXACT SAMPLING LOCATION: SEE SITE MAP		
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY: J Mosley	DATE 1-23-91	TIME 1830
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME

SAMPLE RELINQUISHED AFTER ANALYSES:	ANALYZED SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE DESCRIPTION:	# OF CONTAINERS:		

FORM № 2837

AQUA SURVEY, INC.

Job # _____

Client EXXON BAYWAY

Facility Location LINDEN NJ

Discharge # _____

Contact _____

Phone # _____

Sample Collection Point Description See Site MAP - NORTH & SOUTH ALONG A & B PIERS

TEST TYPE Acute _____ Diluent Only _____ Chronic _____ Other V

Diluent Collection Location _____

Shipping Information

To: ASI FLEMINGTON NJ

From: EXXON BAYWAY FACILITY PIER DREDGING SITES

Shipment Method / Special Instructions

TO ASI VIA ASI VEHICLE

Sample Type Key: C = composite; (G) = grab; S = soil; SD = sediment; SL = sludge

Diluent/Effluent Sample Number	Collected By Name(Please Print) / Date / Time	Sample Type	Sample Volume	Relinquished By Signature / Date / Time	Received By Signature / Date / Time	Relinquished By Signature / Date / Time	Received By Signature / Date / Time
1	G.M. 2/4/92 1425	G	7GAL		G.M. 2/4/92 1930		
2	" " 1353	"	7GAL		"		
3	" " 0930	"	7GAL		"		
4	" " 1320	"	10 GAL		"		
5	" " 0950	"	10 GAL		"		
6	" " 1010	"	10 GAL		"		
7	" " 1055	"	10 GAL		"		
8	" " 1536	"	12 GAL		"		
9	" " 1235	"	12GAL		"		
10	" " 1638	"	12GAL		"		

ALL OF ABOVE SAMPLES CONSIST OF VERY SOFT TO SEMI-FIRM BLACK MUD. NO STREAKS

00031

Job # 2-065

Client EXXON BAYWAY

Facility Location LINDEN NJ

Discharge #

Contact KEN CHRISTIANSON

Phone # 474-7259

Sample Collection Point Description Core # 4, 5, 6, & 7 - See AMEC Collection Points on Site Map

TEST TYPE Acute ____ Diluent Only ____ Chronic ____ Other Solid Phase

Diluent Collection Location

Shipping Information

To: ASI Flemington, NJ.

From: BAYWAY FACILITY

Shipment Method / Special Instructions

ASI Vehicle

Sample Type Key: C = composite; G = grab; S = soil; SD = sediment; SL = sludge

Diluent / Effluent Sample Number	Collected By Name(Please Print) / Date / Time	Sample Type	Sample Volume	Relinquished By Signature / Date / Time	Received By Signature / Date / Time	Relinquished By Signature / Date / Time	Received By Signature / Date / Time
Core 4	G. Mantje 0920 3/23/92	SD	5 GAL				
" 5	" 0850 "	"	"	G. Mantje	U.S. Couriers		
" 6	" 0840 "	"	"	3/23/92	3/23/92 4:00PM		
" 7	" 0947 "	"	"				

23000

28 DAY BIOACCUMULATION

CHAIN OF CUSTODY RECORD

FACILITY/LOCATION: ASI 92-91361 EXXON BAYWAY	METHOD OF SHIPMENT: NYTEST TO NYTEST FROM ASI
SAMPLING AND ANALYSES AUTHORIZED BY: NYTEST	DATE: 3-24-92

SAMPLE #	SAMPLING LOCATION AND DESCRIPTION	DATE	TIME	SAMPLE TYPE C	SAMPLE TYPE G	SAMPLE TYPE SOLID	# OF CONT.	ANALYSES REQUIRED
1	PRETEST					TISSUE	1	
2	CONTROL 1-3						3	
3	REFERENCE 1-5						5	
4	AREA 1 1-5						5	
5	AREA 2 1-5						5	
6	AREA 3 1-5						5	

SAMPLE COLLECTED BY: ASI	EXACT SAMPLING LOCATION: BAYWAY MOBILE LABORATORY		
SAMPLE RELINQUISHED BY: W. Scott Douglas	SAMPLE RECEIVED BY: Thomas Brancato	DATE 3/24/92	TIME 2:30 PM
SAMPLE RELINQUISHED BY: Thomas Brancato	SAMPLE RECEIVED BY: Bill Robert	DATE 7/24	TIME 6:20
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME

SAMPLE RELINQUISHED AFTER ANALYSES:	ANALYZED SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE DESCRIPTION:	# OF CONTAINERS:		

FORM № 3849

AQUA SURVEY, INC.

SAMPLE DESCRIPTION INFORMATION

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
063408-0001-SA	AREA IA	TISSUE	21 MAR 92		26 MAR 92
063408-0001-MB	Method Blank	TISSUE			26 MAR 92
063408-0002-SA	AREA IB	TISSUE	21 MAR 92		26 MAR 92
063408-0003-SA	AREA IC	TISSUE	21 MAR 92		26 MAR 92
063408-0004-SA	AREA ID	TISSUE	21 MAR 92		26 MAR 92
063408-0005-SA	AREA IIA	TISSUE	21 MAR 92		26 MAR 92
063408-0006-SA	AREA IIB	TISSUE	21 MAR 92		26 MAR 92
063408-0007-SA	AREA IIC	TISSUE	21 MAR 92		26 MAR 92
063408-0008-SA	AREA IID	TISSUE	21 MAR 92		26 MAR 92
063408-0008-MB	Method Blank	TISSUE			26 MAR 92
063408-0009-SA	AREA IIE	TISSUE	21 MAR 92		26 MAR 92
063408-0010-SA	AREA IE	TISSUE	21 MAR 92		26 MAR 92
063408-0011-SA	AREA IIIA	TISSUE	21 MAR 92		26 MAR 92
063408-0012-SA	AREA IIIB	TISSUE	21 MAR 92		26 MAR 92
063408-0013-SA	AREA IIIC	TISSUE	21 MAR 92		26 MAR 92
063408-0014-SA	AREA IIID	TISSUE	21 MAR 92		26 MAR 92
063408-0015-SA	AREA IIIE	TISSUE	21 MAR 92		26 MAR 92
063408-0015-MB	Method Blank	TISSUE			26 MAR 92
063408-0016-SA	COMP. PRE TEST	TISSUE	21 MAR 92		26 MAR 92
063408-0016-DU	COMP. PRE TEST	TISSUE	21 MAR 92		26 MAR 92
063408-0016-TR	COMP. PRE TEST	TISSUE	21 MAR 92		26 MAR 92
063408-0016-MB	Method Blank	TISSUE			26 MAR 92
063408-0017-SA	Reference 1	TISSUE	21 MAR 92		26 MAR 92
063408-0018-SA	Reference 2	TISSUE	21 MAR 92		26 MAR 92
063408-0019-SA	Reference 3	TISSUE	21 MAR 92		26 MAR 92
063408-0020-SA	Reference 4	TISSUE	21 MAR 92		26 MAR 92
063408-0021-SA	Reference 5	TISSUE	21 MAR 09		26 MAR 92

% Lipid Content

Method

Matrix: TISSUE
Units: %

Received: 26 MAR 92
Authorized: 26 MAR 92

Lab ID	Client ID	Result	Reporting Limit	Date Prepared	Date Analyzed
063408-0001-SA	AREA IA	0.90	NA	NA	12 APR 92
063408-0002-SA	AREA IB	0.75	NA	NA	12 APR 92
063408-0003-SA	AREA IC	0.85	NA	NA	12 APR 92
063408-0004-SA	AREA ID	1.3	NA	NA	12 APR 92
063408-0005-SA	AREA IIA	0.95	NA	NA	12 APR 92
063408-0006-SA	AREA IIB	1.1	NA	NA	12 APR 92
063408-0007-SA	AREA IIC	0.80	NA	NA	12 APR 92
063408-0008-SA	AREA IID	1.2	NA	NA	12 APR 92
063408-0009-SA	AREA IIE	0.80	NA	NA	12 APR 92
063408-0010-SA	AREA IE	0.80	NA	NA	12 APR 92
063408-0011-SA	AREA IIIA	0.65	NA	NA	12 APR 92
063408-0012-SA	AREA IIIB	0.75	NA	NA	12 APR 92
063408-0013-SA	AREA IIIC	1.0	NA	NA	12 APR 92
063408-0014-SA	AREA IIID	0.95	NA	NA	12 APR 92
063408-0015-SA	AREA IIIE	1.1	NA	NA	12 APR 92
063408-0016-DU	COMP. PRE TEST	1.2	NA	NA	12 APR 92
063408-0016-SA	COMP. PRE TEST	1.2	NA	NA	12 APR 92
063408-0016-TR	COMP. PRE TEST	1.2	NA	NA	12 APR 92
063408-0017-SA	Reference 1	0.90	NA	NA	12 APR 92
063408-0018-SA	Reference 2	1.1	NA	NA	12 APR 92
063408-0019-SA	Reference 3	1.2	NA	NA	12 APR 92
063408-0020-SA	Reference 4	1.4	NA	NA	12 APR 92
063408-0021-SA	Reference 5	1.5	NA	NA	12 APR 92

ND = Not detected
NA = Not applicable

Reported By: Sandra Davis

Approved By: Tom Doty

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: COMP. PRE TEST
Lab ID: 063408-0016-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 08 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.42	
	% Recovery			
13C-2,3,7,8-TCDD	101			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: COMP. PRE TEST
Lab ID: 063408-0016-DU
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 10 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.34	
	% Recovery			
13C-2,3,7,8-TCDD	122			

ND = Not detected
NA = Not applicable

Reported By: Chuck Pudwill

Approved By: Maricon Estrada

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: COMP. PRE TEST
Lab ID: 063408-0016-TR
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 10 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.33	
	% Recovery			
13C-2,3,7,8-TCDD	122			

ND = Not detected
NA = Not applicable

Reported By: Chuck Pudwill

Approved By: Maricon Estrada

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Reference 1
Lab ID: 063408-0017-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 08 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.59	
	% Recovery			
13C-2,3,7,8-TCDD	84			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Reference 2
Lab ID: 063408-0018-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 09 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.47	
	% Recovery			
13C-2,3,7,8-TCDD	105			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Reference 3
Lab ID: 063408-0019-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 09 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.63	
	% Recovery			
13C-2,3,7,8-TCDD	53			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Reference 4
Lab ID: 063408-0020-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 09 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.50	
	% Recovery			
13C-2,3,7,8-TCDD	103			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Reference 5
Lab ID: 063408-0021-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 09
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 09 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.50	
	% Recovery			
13C-2,3,7,8-TCDD	98			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IA
Lab ID: 063408-0001-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 10 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	6.0	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	94			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IB
Lab ID: 063408-0002-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 07 APR 92

Sample Amount	10.0 G
Percent Moisture	NA
Column Type	DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	7.1	pg/g	--	
% Recovery				
13C-2,3,7,8-TCDD	98			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.

Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IC
Lab ID: 063408-0003-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 07 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	5.7	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	118			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA ID
Lab ID: 063408-0004-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 10 APR 92

Sample Amount 10.5 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	2.2	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	118			

ND = Not detected
NA = Not applicable

Reported By: Chuck Pudwill

Approved By: Maricon Estrada

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IE
Lab ID: 063408-0010-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 09 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	2.3	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	120			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIA
Lab ID: 063408-0005-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 07 APR 92

Sample Amount 10.2 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	3.7	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	116			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIB
Lab ID: 063408-0006-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 07 APR 92

Sample Amount	10.0 G
Percent Moisture	NA
Column Type	DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	5.9	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	112			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIC
Lab ID: 063408-0007-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 07 APR 92

Sample Amount 10.3 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	7.3	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	94			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IID
Lab ID: 063408-0008-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 07 APR 92

Sample Amount 10.2 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	4.8	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	103			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIE
Lab ID: 063408-0009-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 07 APR 92

Sample Amount 10.3 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	2.5	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	102			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIIA
Lab ID: 063408-0011-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 07 APR 92

Sample Amount 10.3 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	5.0	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	99			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIIB
Lab ID: 063408-0012-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 08 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	1.7	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	110			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIIC
Lab ID: 063408-0013-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 08 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	5.7	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	81			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIID
Lab ID: 063408-0014-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 08 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	2.8	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	70			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: AREA IIIE
Lab ID: 063408-0015-SA
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: 21 MAR 92
Prepared: 02 APR 92

Received: 26 MAR 92
Analyzed: 10 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	1.4	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	117			

ND = Not detected
NA = Not applicable

Reported By: Chuck Pudwill

Approved By: Maricon Estrada

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Method Blank
Lab ID: 063408-0001-MB
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: NA
Prepared: 02 APR 92

Received: NA
Analyzed: 07 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.59	
	% Recovery			
13C-2,3,7,8-TCDD	104			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Method Blank
Lab ID: 063408-0008-MB
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: NA
Prepared: 02 APR 92

Received: NA
Analyzed: 07 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.47	
	% Recovery			
13C-2,3,7,8-TCDD	110			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Method Blank
Lab ID: 063408-0015-MB
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: NA
Prepared: 02 APR 92

Received: NA
Analyzed: 08 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.68	
	% Recovery			
13C-2,3,7,8-TCDD	96			

ND = Not detected
NA = Not applicable

Reported By: Jill Kellmann

Approved By: Eric Redman

The cover letter is an integral part of this report.
Rev 230787

2,3,7,8-TCDD

HIGH RESOLUTION

Client ID: Method Blank
Lab ID: 063408-0016-MB
Matrix: TISSUE
Authorized: 26 MAR 92

Sampled: NA
Prepared: 04 APR 92

Received: NA
Analyzed: 09 APR 92

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.38	
	% Recovery			
13C-2,3,7,8-TCDD	102			

ND = Not detected
NA = Not applicable

Reported By: Adrian Messecar

Approved By: Maricon Estrada

The cover letter is an integral part of this report.
Rev 230787

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

April 16,1992

Exxon USA
1400 Park Ave.
Linden , NJ 07036

Attn: R.A. Greaux

Nytest is pleased to submit our Project No. 9117786
Log in No. 11447,11449,11450 on your sample (s) received: 2/11/92

Test sample (s) associated with this project will be retained for a period of thirty (30) days, unless otherwise instructed.

My staff is available to answer any questions concerning our report and we look forward to serving your future analytical needs.

Very truly yours,

Nytest Environmental Inc.

Remo Gigante

Remo Gigante
Exec. VP

RG:
Enc. Revised

SHIPPED VIA: NEI DRIVER

box 1518 □ 60 seaview blvd., port washington, ny 11050 □ (516) 625-5500
fax (516) 625-1274

nytest environmental inc.

Project No.: 9117786
Log in No. :11447,11449,11450
P.O. No. : DAWT90312K55485
Date : March 31, 1992

ANALYTICAL DATA REPORT
PACKAGE FOR

Exxon USA

1400 Park Ave.

Linden, NJ 07036

ATTN: R. A. Greaux
REF: Exxon Bayway

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE

SEE FOLLOWING PAGES

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

PARAG K. SHAH, Ph. D.
ORGANIC LAB. MANAGER
lj

DOUGLAS SHEELEY
LABORATORY DIRECTOR
NJ Cert# 73469

Report on sample(s) furnished by client applies to sample(s). Report on sample(s) obtained by us applies only to lot sampled. Information contained herein is not to be used for reproduction except by special permission. Sample(s) will be retained for thirty days maximum after date of report unless specifically requested otherwise by client. In the event that there are portions or parts of sample(s) remaining after Nytest has completed the required tests, Nytest shall have the option of returning such sample(s) to the client at the client's expense.

OCEAN DISPOSAL BIOMONITORING REPORT FOR EXXON, BAYWAY REFINERY OLD GUIDANCE STUDIES

NYTEST ENVIRONMENTAL, INC.
P.O. BOX 1518
60 SEAVIEW BLVD.
PORT WASHINGTON, NEW YORK 11050

APRIL 7, 1992

BR92-1787

JOB # 91-361

I. SCOPE OF WORK

A. Location and Purpose

The biological assay testing described in this report was performed with respect to dredged material to be disposed of in ocean waters.

B. Services

1. The following analyses were performed on the Bayway sediment samples:

   a. Solid Phase Bioaccumulation
   Suspended Particulate Phase
   Grain Size

   b. A Solid Phase Bioassay was performed on the sediment samples to determine the acute 10-day toxicity to *Nereis virens*, *Mercenaria mercenaria* and *Palaemonetes pugio*.

   c. A Suspended Particulate Phase Bioassay was performed on the sediment samples to determine the acute 96-hour toxicity to *Acartia tonsa*, *Mysidopsis bahia* and *Menidia menidia*.

   d. Tissues were prepared and sent to NYTEST for chemical analyses in accordance with the following method:

   Ecological Evaluation of Proposed Discharge of Dredged Material Into Ocean Waters
   (Implementation Manual for Section 103 of the Public Law 92-532 [Marine Protection, Research and Sanctuaries Act of 1972], EPA/COE (July 1977).

2. The following test associated services were provided:

   a. Proper chain-of-custody and QA/QC procedures were followed.

   b. Appropriate precautions for the health and safety of personnel were followed.

II. METHODOLOGY

A. Sediment Sampling

1. The sediment was collected by ASI personnel from ACOE designated area (See Figure 2). Ten cores were collected from the site, each core was cored to project depth. A composite was made of cores 1-3 (referred to hereafter as Area 1); of cores 4 - 7 (referred to hereafter as Area 2); and of cores 8 - 10 (referred to hereafter as Area 3). A site map is provided in Figure 1.

2. Control sediment was Petersen-dredged from Milton Harbor, New York in ACOE designated area (see Figure 2).

3. Reference Sediment was dredged under supervision of NYTEST personnel from ACOE designated area off the New Jersey coast (Loran C Coordinates on 9960 X and Y are 26910.7. 43629.2).

4. Samples of sediment and site water were maintained at 4° $\pm$ 2° C. Any opened containers of sediment were flushed with nitrogen prior to returning to storage.

B. Bioassay Procedures

1. Procedures for conducting the Solid Phase and Suspended Particulate Phase Bioassays:

   a. Ecological Evaluation Of Proposed Discharge Of Dredged Material Into Ocean Waters
   (Implementation Manual for Section 103 of the Public Law 92-532 [Marine Protection, Research and Sanctuaries Act of 1972], EPA/COE (July 1977).

   b. Guidance For Performing Tests On Dredged Material To Be Disposed Of In Ocean Waters
   EPA Region II/COE Regulatory Branch (Water Quality Compliance Section), (21 December 1984).

C. Test Organisms

1. *Nereis virens* were obtained from Aquatic Research Organisms (ARO), Hampton, NH. They were shipped in moist seaweed and removed for acclimation immediately upon arrival at the laboratory.

2. *Mercenaria mercenaria* were obtained from Mariculture Industries, Atlantic City, New Jersey. Acclimation to sediment was begun immediately on arrival at the laboratory.

3. *Palaemonetes pugio* were obtained from Aquatic Indicators, St. Augustine, Florida. Acclimation to sediment was begun immediately on arrival at the laboratory.

4. *Acartia tonsa* were cultured in the bioassay laboratory.

5. *Mysidopsis bahia* were cultured in the bioassay laboratory.

6. *Menidia menidia* were obtained from Multi Aquaculture Systems of Amagansett, New York and SP Engineering, Salem, Massachusetts.

7. Acclimation of *Mercenaria mercenaria* and *Nereis virens* to reference or control sediment was accomplished over two days before addition of test material.

8. Acclimation of *Palaemonetes pugio* and *Menidia menidia* to test water salinity were accomplished through daily renewals over several days.

D. Grain Size Procedures

1. Grain size analyses were performed in accordance with:

   Standard Method for Particle-Size Analysis of Soils
   ASTM Designation: D 422 - 63 (Reapproved 1972) American National Standard A37 145-1972 Approved March 2, 1972 by American National Standard Institute.

III. RESULTS

A. Solid Phase Bioassay

The 10-day Solid Phase Bioassay required that live counts be attempted each day. A definitive count could only be made at the end of the exposure (240-hour). Solid Phase Bioassays were performed with *Nereis virens*, *Mercenaria mercenaria* and *Palaemonetes pugio*. See Tables 1.1-4 for test results.

Table 1.1

Results of the 10-day Solid Phase Bioassay. Testing was initiated with 20 *Nereis virens* per replicate.

Sample	Replicate	Final Live Count
control 004	1	20
	2	20
	3	20
reference 003	1	20
	2	20
	3	20
	4	20
	5	19
Area 1	1	19
	2	19
	3	18
	4	19
	5	17
Area 2	1	19
	2	18
	3	19
	4	19
	5	18
Area 3	1	19
	2	19
	3	18
	4	19
	5	18

Table 1.2

Results of the 10-day Solid Phase Bioassay. Testing was initiated with 20 *Mercenaria mercenaria* per replicate.

Sample	Replicate	Final Live Count
control	1	20
004	2	20
	3	20
reference	1	20
003	2	20
	3	20
	4	20
	5	20
Area 1	1	20
	2	19
	3	20
	4	20
	5	20
Area 2	1	20
	2	20
	3	20
	4	20
	5	20
Area 3	1	20
	2	20
	3	20
	4	20
	5	20

Table 1.3

Results of the 10-day Solid Phase Bioassay. Testing was initiated with 100 *Palaemonetes pugio* per replicate.

Sample	Replicate	Final Live Count
control 004	1	97
	2	100
	3	100
reference 003	1	99
	2	97
	3	97
	4	89
	5	100
Area 1	1	94
	2	95
	3	96
	4	92
	5	92
Area 2	1	93
	2	95
	3	95
	4	91
	5	93
Area 3	1	92
	2	91
	3	90
	4	100
	5	97

Table 1.4

Solid Phase Chemical/Physical Data Ranges for the 10-Day *N. virens* , *M. mercenaria* and *P. pugio* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C°)	Dissolved Oxygen (ppm)
Control 1-3	7.6-7.9	28.0-32.0	19.0-21.0	5.8-7.0
Reference 1-5	7.6-7.9	28.0-32.0	19.5-21.0	5.4-7.2
Area 1	7.3-7.8	28.0-31.0	19.0-22.0	4.6-7.0
Area 2	7.4-7.8	28.0-31.0	18.0-21.0	3.7-7.0
Area 3	7.4-7.8	28.0-32.0	18.5-21.5	4.4-6.6

B. Suspended Particulate Phase

Suspended Particulate Phase Bioassays were performed with *Acartia tonsa*, *Mysidopsis bahia*, and *Menidia spp.* See Table 2.1-6.

Table 2.1 AREA 1

Results of 96-hour Suspended Particulate Phase Bioassays. Tests were initiated with 20 organisms per replicate.

		Live Counts		
Conc.	**Rep.**	*A. tonsa*	*M. bahia*	*Menidia spp.*
control	A	19	20	20
	B	16	20	20
	C	17	20	20
10%	A	19	17	20
	B	18	19	20
	C	17	20	20
50%	A	2	16	20
	B	3	14	19
	C	4	17	20
100%	A	0	0	0
	B	0	0	0
	C	0	0	0

Table 2.2 AREA 2

Results of 96-hour Suspended Particulate Phase Bioassays. Tests were initiated with 20 organisms per replicate.

Conc.	Rep.	Live Counts *A. tonsa*	*M. bahia*	*Menidia spp.*
control	A	19	20	20
	B	18	20	20
	C	17	19	20
10%	A	14	19	20
	B	16	20	20
	C	19	18	20
50%	A	15	19	20
	B	16	19	19
	C	9	17	20
100%	A	2	4	0
	B	0	1	0
	C	0	0	0

Table 2.3 AREA 3

Results of 96-hour Suspended Particulate Phase Bioassays. Tests were initiated with 20 organisms per replicate.

Conc.	Rep.	Live Counts *A. tonsa*	*M. bahia*	*Menidia spp.*
control	A	18	19	19
	B	16	19	19
	C	17	20	19
1%	A	18	NA	NA
	B	16	NA	NA
	C	19	NA	NA
10%	A	15	20	19
	B	18	18	18
	C	13	20	19
50%	A	0	5	0
	B	0	11	0
	C	0	6	0
100%	A	0	0	0
	B	0	0	0
	C	0	0	0

NA = NOT APPLICABLE

AREA 1

Table 2.4.1

Suspended Particulate Phase Chemical/Physical Data Ranges for 96-hour *A. tonsa* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.9-8.2	28.0-29.0	18.0-19.0	6.3-6.6
10%	7.9-8.3	28.0-29.0	18.0-19.0	6.1-6.5
50%	7.7-8.6	28.0-28.5	18.0-19.5	6.0-6.5
100%	7.6-8.8	27.0-28.0	18.0-19.0	6.0-6.5

Table 2.4.2

Suspended Particulate Phase Chemical/Physical Data Ranges for 96-hour *M. bahia* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.7-8.3	28.0-29.0	18.0-23.0	6.2-7.6
10	7.7-8.2	28.0-29.0	18.0-23.5	6.2-7.6
50%	7.7-8.3	28.0-29.0	18.0-23.5	6.2-7.5
100%	7.6-8.3	28.0-30.0	18.0-23.5	6.1-7.5

Table 2.4.3

Suspended Particulate Phase Chemical/Physical Data Ranges for 96-hour *Menidia spp.* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.7-8.1	28.0-30.0	16.0-22.0	6.8-8.0
10%	7.7-8.1	28.0-30.0	16.0-22.0	6.2-8.0
50%	7.4-8.3	27.5-30.0	16.5-22.0	6.4-8.0
100%	7.4-8.3	27.5-29.5	16.0-21.5	6.2-7.9

AREA 2

Table 2.5.1

Suspended Particulate Phase Chemical/Physical Data Ranges for 96-hour *A. tonsa* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.9-8.3	28.0-29.0	18.5-19.0	6.2-6.5
10%	7.9-8.3	28.0-29.0	18.5-19.5	6.2-6.3
50%	7.9-8.6	27.5-28.5	18.0-19.5	6.2-6.3
100%	7.8-8.7	27.0-28.0	18.0-19.5	6.1-6.3

Table 2.5.2

Suspended Particulate Phase Chemical/Physical Data Ranges for 96-hour *M. bahia* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.8-8.2	30.0-31.5	19.0-20.5	6.7-7.4
10	7.8-8.2	30.0-32.0	19.0-20.5	6.6-7.3
50%	7.7-8.2	29.5-32.0	19.0-21.0	6.6-7.4
100%	7.7-8.3	29.0-31.0	19.0-21.0	6.6-7.4

Table 2.5.3

Suspended Particulate Phase Chemical/Physical Data Ranges for 96-hour *Menidia spp.* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.6-8.0	31.0-32.0	19.5-22.0	7.0-7.4
10%	7.4-8.0	30.5-32.0	18.5-22.0	7.1-7.4
50%	7.1-8.1	30.0-32.0	18.0-21.5	6.6-7.5
100%	6.7-8.2	29.5-30.5	19.0-22.0	5.4-7.4

AREA 3

Table 2.6.1

Suspended Particulate Phase Concentration — Chemical/Physical Data Ranges for 96-hour *A. tonsa* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.9-8.3	28.0-29.0	18.5-19.5	6.1-6.5
1%	7.9-8.3	28.0-29.0	18.5-19.5	6.1-6.4
10%	7.9-8.4	28.0-29.0	18.5-19.5	6.0-6.4
50%	7.7-8.6	27.5-28.5	18.0-19.5	6.0-6.4
100%	7.6-8.8	27.0-28.0	18.0-19.5	5.9-6.4

Table 2.6.2

Suspended Particulate Phase Concentration — Chemical/Physical Data Ranges for 96-hour *M. bahia* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.9-8.2	28.0-33.0	19.5-22.0	6.2-7.5
10	7.8-8.2	29.0-36.0	19.5-22.0	6.1-7.4
50%	7.5-8.3	28.0-34.0	19.5-22.0	6.2-7.3
100%	7.4-8.4	28.0-29.0	18.5-22.0	6.6-7.2

Table 2.6.3

Suspended Particulate Phase Concentration — Chemical/Physical Data Ranges for 96-hour *Menidia spp* Bioassay.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0%	7.9-8.1	28.5-32.0	18.5-20.5	7.0-7.5
10%	7.8-8.2	28.5-33.0	18.5-21.0	7.0-7.6
50%	7.6-8.3	28.5-29.0	19.5-20.0	7.4-7.6
100%	7.3-8.2	28.0-28.5	18.0-20.0	6.4-7.4

3. Standard Reference Toxicant Bioassays

Standard Reference Toxicant Bioassays were performed with *Acartia tonsa, Mysidopsis bahia* and *Menidia menidia*. See Table 3.1-3.4 for results.

Table 3.1

Results of 96-hour Standard Reference Toxicant Bioassays with Sodium Lauryl Sulfate. Bioassays were initiated with 10 organisms per replicate.

Conc.	Rep.	Final Live Counts				
		A. tonsa	M. bahia	Menidia spp.*		
				1	2	3
control	A	9	9	10	10	9
	B	10	10	10	10	9
0.6	A	7	NA	NA	10	9
	B	9	NA	10	10	9
1.3	A	8	10	10	10	9
	B	10	9	10	10	9
2.5	A	1	10	10	0	0
	B	2	9	0	0	0
5.0	A	0	5	0	0	0
	B	0	5	0	0	0
10.0	A	NA	0	NA	NA	NA
	B	NA	0	NA	NA	NA

* Numbers refer to Area number for which test the SRT applies

Table 3.2

.iemical/Physical Data Ranges for *A. tonsa* Standard Reference Toxicant Test.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0.0	7.6-8.1	28.0-29.0	18.0-22.0	5.5-7.4
0.6	7.6-8.1	28.0-29.0	18.0-22.0	5.5-7.5
1.3	7.6-8.2	28.0-29.0	18.0-22.0	5.6-7.5
2.5	7.7-8.2	28.0-29.0	18.0-22.0	5.7-7.5
5.0	7.7-8.0	28.0	20.5-22.0	5.2-7.3

Table 3.3

Chemical/Physical Data Ranges for *M. bahia* Standard Reference Toxicant Test.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
` 0	7.8-8.2	28.0-31.0	19.5-20.5	6.5-7.5
..25	7.9-8.2	28.0-31.0	19.5-20.5	6.6-7.4
2.5	7.9-8.1	28.0-31.0	19.5-20.5	6.5-7.4
5.0	7.9-8.1	28.0-31.0	19.5-20.5	6.5-7.4
10.0	7.9-8.0	28.0-31.0	19.5-20.5	6.2-7.4

Table 3.4.1

Chemical/Physical Data Ranges for Area 1 *Menidia spp.* Standard Reference Toxicant Test.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0.0	7.4-7.7	31.0-31.5	18.5-21.5	3.4-8.6
0.6	7.6-7.8	31.0-31.5	18.5-21.5	3.6-8.8
1.3	7.5-7.8	31.0-31.5	18.5-21.5	3.1-8.8
2.5	7.6-7.8	31.0-31.5	19.0-21.5	3.7-8.8
5.0	7.7-7.9	31.0-31.5	18.0-21.5	7.0-8.8

Table 3.4.2

Chemical/Physical Data Ranges for Area 2 *Menidia spp.* Standard Reference Toxicant Test.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0.0	7.8-8.0	27.5-28.0	18.0-20.5	6.2-7.8
0.6	7.8-8.0	27.5-28.0	18.0-20.5	6.2-7.8
1.3	7.8-8.0	27.5-28.0	18.0-20.5	6.2-7.8
2.5	7.9-8.0	27.5-28.0	18.0-18.5	7.3-7.8
5.0	7.9-8.0	27.5-28.0	18.0-18.5	7.5-7.7

Table 3.4.3

Chemical/Physical Data Ranges for Area 3 *Menidia spp.* Standard Reference Toxicant Test.

Concentration	pH	Salinity (ppt)	Temp. (C)	Dissolved Oxygen (ppm)
0.0	7.3-7.9	29.0-29.5	18.0-20.5	3.7-7.9
0.6	7.3-7.9	29.0-30.0	18.0-21.0	3.2-8.1
1.3	7.3-8.0	29.0-30.0	18.0-21.0	2.4-7.8
2.5	7.9	29.0-30.0	18.0-21.0	6.3-7.7
5.0	7.9	29.0-30.5	18.0-21.0	6.8-7.8

D. Physical Testing

Grain size and water content determinations were made for control and reference sediment. Grain size distribution is defined by the following criteria:

Sand < 0.0625 mm
Silt < 0.0625 but > 0.0039 mm
Clay < 0.0039 mm

The results of the physical testing are reported in Table 4.

Table 4

Results of Grain Size and Moisture Content Analyses.

	% Sand	% Silt	% Clay	% Moisture
Control	44.0	31.0	25.0	54.9
Reference	95.0	3.0	2.0	17.9

IV. SUMMARY

A. Solid Phase Bioassays

As detailed in Tables 1.A through 1.C, there was less than 10% control or reference organism mortality. The following mortalities were observed among organisms exposed to test sediment.

	Area 1	Area 2	Area 3
Nereis virens	8.0%	7.0%	7.0%
Mercenaria mercenaria	1.0%	0.0%	0.0%
Palaemonetes pugio	6.2%	6.6%	6.0%

B. Suspended Particulate Phase Bioassays

The 96 hour LC50 results for the Suspended Particulate Phase are as follow:

	Area 1	Area 2	Area 3
Acartia tonsa	23.63%	42.01%	15.62%
Mysidopsis bahia	47.51%	70.71%	33.27%
Menidia menidia	69.08%	65.33%	19.49%

C. Standard Reference Toxicant Bioassays

Standard reference toxicant (Sodium Dodecyl Sulfate) was purchased from Aldrich Chemical Company. Manasquan Inlet seawater was utilized as diluent. The following LC50 values were calculated:

Acartia tonsa	96 hour LC50 = 1.63 ppm 95% C.L. = 1.25 - 2.09 ppm (Moving Average)
Mysidopsis bahia	96 hour LC50 = 4.56 ppm 95% C.L. = 3.74 - 5.77 ppm (Moving Average)
Menidia spp	
Area 1	96 hour LC50 = 2.5 ppm 95% C.L. = 1.25 - 5.00 ppm (Binomial Method)
Area 2	96 hour LC50 = 1.77 ppm 95% C.L. = 1.25 - 2.50 ppm (Binomial Method)
Area 3	96 hour LC50 = 1.42 ppm 95% C.L. = 1.10 - 1.75 ppm (Moving Average)

APPENDIX

AQUA SURVEY, INC
SOLID PHASE LIVE COUNTS

CLIENT: EXXON BAYWAY TEST START: 1-30-92 ORGANISM: N. virens

JOB NUMBER: 92-91361 DEPURATION START: 2-9-92

SAMPLE ID	RP	INITIAL	FINAL	NOTES AND OBSERVATIONS
CONTROL #004	1	20	20	
	2	20	20	
	3	20	20	1 being picked on, trying to get in SW 2/1
REFERENCE ECC3	1	20	20	
	2	20	20	1 being picked on SW 2/4 " " 2/5 " 2/6 " 2/7 2/8
	3	20	20	
	4	20	20	
	5	20	19	1 being picked on SW 2/7 1 almost dead SW 2/8
SAMPLE 1	1	20	19	
	2	20	19	tank leaked, made up with exposure, removed animals from old placed into new SW 2/1
AREA 1	3	20	18	1 died on surface SW 2/1
	4	20	19	
	5	20	17	
SAMPLE 2	1	20	19	
	2	20	18	
AREA 2	3	20	19	1 dead SW 2/1
	4	20	19	
	5	20	18	
SAMPLE 3	1	20	19	1 dead SW 2/1
	2	20	19	
AREA 3	3	20	18	
	4	20	19	
	5	20	18	
SAMPLE 4	1			
	2			
	3			
	4			
	5			
SAMPLE 5	1			
	2			
	3			
	4			
	5			
INIT/QAQC	S	SC 2/6 1/2	SD 2/7/9	

00021 SP-LC

AQUA SURVEY, INC
SOLID PHASE LIVE COUNTS

CLIENT: Exxon Bayway TEST START: 1-30-92 ORGANISM: M. mercenaria

JOB NUMBER: 92-91361 DEPURATION START: 2-9-92

SAMPLE ID	R P	INITIAL	FINAL	NOTES AND OBSERVATIONS
CONTROL #004	1	20	20	
	2	20	20	
	3	20	20	
REFERENCE #003	1	20	20	
	2	20	20	
	3	20	20	
	4	20	20	
	5	20	20	
SAMPLE 1 AREA 1	1	20	20	
	2	20	19	
	3	20	20	
	4	20	20	
	5	20	20	
SAMPLE 2 AREA 2	1	20	20	
	2	20	20	
	3	20	20	
	4	20	20	
	5	20	20	
SAMPLE 3 AREA 3	1	20	20	
	2	20	20	
	3	20	20	
	4	20	20	
	5	20	20	
SAMPLE 4	1			
	2			
	3			
	4			
	5			
SAMPLE 5	1			
	2			
	3			
	4			
	5			
INIT/QAQC	S	SD/SG 1/30	SD SG 2/9	

SP-LC

00022

AQUA SURVEY, INC
SOLID PHASE LIVE COUNTS

CLIENT: EXXON BAYWAY TEST START: 1-30-92 ORGANISM: P. pugio

JOB NUMBER: 92-91361 DEPURATION START: 2-9-92

SAMPLE ID	RP	INITIAL	FINAL	NOTES AND OBSERVATIONS
CONTROL #004	1	100	97	
	2	100	100	
	3	100	100	
REFERENCE #003	1	100	99	
	2	100	97	
	3	100	97	
	4	100	89	
	5	100	100	
SAMPLE 1 AREA 1	1	100	94	
	2	100	95	
	3	100	96	
	4	100	92	
	5	100	92	
SAMPLE 2 AREA 2	1	100	93	
	2	100	95	
	3	100	95	
	4	100	91	
	5	100	93	
SAMPLE 3 AREA 3	1	100	92	
	2	100	91	
	3	100	90	
	4	100	100	
	5	100	97	
SAMPLE 4	1			
	2			
	3			
	4			
	5			
SAMPLE 5	1			
	2			
	3			
	4			
	5			
INIT/QAQC	S	SOK SG 1/30	SOK SG 2/9	

SP-LC

AQUA SURVEY, INC
SOLID PHASE READINGS

CLIENT: EXXON BAYWAY TEST START: 1-30-92 PARAMETER: pH

JOB NUMBER: 92-91361 METER NUMBER:

SAMPLE ID	RP	00	1	2	3	4	5	6	7	8	9	10
CONTROL	1	7.6	7.7	7.6	7.6	7.8	7.7	7.8	7.8	7.8	7.7	7.8
	2	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.8	7.9
	3	7.6	7.7	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.7	7.7
REFERENCE	1	7.6	7.6	7.6	7.6	7.7	7.8	7.8	7.7	7.7	7.6	7.6
	2	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.7	7.8
	3	7.6	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.8	7.7	7.7
	4	7.7	7.7	7.7	7.7	7.8	7.8	7.9	7.8	7.9	7.7	7.9
	5	7.7	7.8	7.7	7.8	7.9	7.8	7.9	7.9	7.8	7.7	7.8
SAMPLE 1 AREA 1	1	7.4	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.7	7.6	7.7
	2	7.4	7.6	7.7	7.6	7.7	7.7	7.7	7.8	7.7	7.6	7.7
	3	7.3	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.8	7.7	7.8
	4	7.5	7.7	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.7	7.8
	5	7.4	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.7	7.7	7.7
SAMPLE 2 AREA 2	1	7.5	7.6	7.6	7.6	7.7	7.7	7.8	7.7	7.6	7.5	7.5
	2	7.5	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.8	7.7	7.7
	3	7.5	7.7	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.7	7.8
	4	7.6	7.7	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.7	7.8
	5	7.4	7.7	7.6	7.6	7.7	7.7	7.8	7.7	7.7	7.7	7.7
SAMPLE 3 AREA 3	1	7.4	7.6	7.5	7.5	7.6	7.7	7.7	7.7	7.7	7.5	7.5
	2	7.4	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.7	7.6	7.6
	3	7.4	7.6	7.5	7.5	6.0①	7.7	7.8	7.7	7.8	7.6	7.6
	4	7.6	7.7	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.6	7.6
	5	7.5	7.6	7.6	7.6	7.8	7.8	7.8	7.7	7.7	7.7	7.7
SAMPLE 4	1											
	2											
	3											
	4											
	5											
SAMPLE 5	1											
	2											
	3											
	4											
	5											
INIT/QAQC		SP 1.8	SG 1.31	SP/SG 2/1	SP/SG 2/2	SG 2/3	SG 2/4	SG 2/5	SG 2/6	SG 2/7	SP/SG 2/4	SP/SG 2/5

① 7.6 mistake SG 2/3

SP-R

AQUA SURVEY, INC
SOLID PHASE READINGS

CLIENT: EXXON BAYWAY/TEST START: 1-30-92 PARAMETER: SALINITY

JOB NUMBER: 92-9136/ METER NUMBER: _____

SAMPLE ID	RP	00	1	2	3	4	5	6	7	8	9	10
CONTROL	1	32 C	29.0	29.5	30.0	28.0	28.5	29.0	29C	28.0	28.0	30.5
	2	31.5	29.5	29.5	29.5	29.0	28.5	29.0	30C	28.0	28.0	30.5
	3	29.0	30.5	29.5	29.5	28.5	28.5	29.5	30C	28.0	28.0	31.0
REFERENCE	1	32.0	30.0	29.5	30.0	28.0	29C	29.5	30C	28.5	28.0	31.0
	2	32.0	30.0	30.0	30.0	28.0	29C	29.5	30C	28.5	28.0	30.5
	3	32.0	30.0	30.0	30.0	28.0	29C	29.5	30C	28.5	29.0	31.0
	4	32.0	30.0	30.0	30.0	28.0	29.0	29.5	30C	28.5	29.0	29.0
	5	31.0	30.0	30.0	30.0	28.0	29.0	30.0	30C	28.5	29.0	31.0
SAMPLE 1	1	31.0	30.0	30.0	30.0	28.0	29C	30.0	30.0	28.5	29.0	31.0
	2	31.0	30.0	30.0	30.0	28.0	29.0	30.0	30.0	28.5	29.0	31.0
AREA 1	3	31.0	30.0	30.0	30.0	28.0	29C	30.0	30.0	28.5	29.0	31.0
	4	31.0	30.0	30.0	30.0	28.0	29.0	30.0	30.0	28.5	29.0	31.0
	5	30.5	30.0	30.0	30.0	28.0	28.5	30.0	30.0	28.5	29.0	30.5
SAMPLE 2	1	28.0	30.0	31.0	31.0	28.0	28.5	30.0	30.0	28.5	29.0	30.5
	2	31.0	30.0	30.0	30.0	28.0	28.5	30.0	30C	28.5	29.0	30.5
AREA 2	3	31.0	30.0	30.0	30.0	28.0	28.5	30.0	30.0	28.5	29.0	30.5
	4	29.0	31.0	30.0	30.0	28.0	29C	30.0	30.0	28.5	29.0	30.5
	5	29.0	31.0	30.0	30.0	28.0	29C	30.0	30.0	28.5	29.0	30.5
SAMPLE 3	1	31.0	30.0	30.0	30.0	28.0	29C	30.0	30.0	28.5	29.0	31.0
	2	32.0	30.0	30.0	30.5	28.0	29C	30.0	30.0	28.5	29.0	31.0
AREA 3	3	32.0	30.0	30.0	30.5	28.0	29C	30.0	30.0	28.5	29.0	31.0
	4	32.0	30.0	30.0	31.0	28.0	29C	30.0	30.0	28.5	29.0	31.0
	5	32.0	30.0	30.0	31.0	28.0	29C	30.0	30.0	28.5	29.0	31.0
SAMPLE 4	1											
	2											
	3											
	4											
	5											
SAMPLE 5	1											
	2											
	3											
	4											
	5											
INIT/QAQC			SV 1/4	SV 1/4	SV 2/1	SV 2/2	SV 2/3	SV 2/4	SV 2/5	SV 2/6	SV 2/7	SV 2/4

SP-R

AQUA SURVEY, INC
SOLID PHASE READINGS

CLIENT: EXXON BAYWAY TEST START: 1-30-92 PARAMETER: TEMPERATURE

JOB NUMBER: 92-91361 METER NUMBER: _____

SAMPLE ID	RP	00	1	2	3	4	5	6	7	8	9	10
CONTROL	1	19.5	20.0	20.0	20.5	20.0	19.5	19.5	20.5	20.0	20.0	19.5
	2	19.5	20.0	20.0	21.0	20.5	20.0	19.5	20.5	20.0	20.0	19.5
	3	19.0	20.0	20.0	21.0	21.0	20.0	19.5	20.5	20.0	20.0	20.0
REFERENCE	1	20.0	20.0	20.0	21.0	21.0	20.0	20.0	20.5	20.0	20.5	20.0
	2	20.0	20.0	20.0	21.0	20.5	20.0	20.0	20.5	20.5	20.5	20.0
	3	20.0	20.0	20.0	21.5	20.0	20.0	20.0	20.5	20.5	20.5	20.0
	4	20.0	20.5	20.0	21.0	20.0	20.0	20.0	21.0	20.5	20.5	19.5
	5	20.0	20.5	20.0	21.0	20.0	20.5	20.0	21.0	20.5	20.5	20.0
SAMPLE 1 AREA 1	1	19.0	20.5	20.0	21.5	20.0	20.5	20.0	21.0	20.5	20.5	20.0
	2	19.0	20.5	20.0	22.0	20.0	20.5	20.0	21.0	20.5	20.5	20.0
	3	19.0	20.5	20.0	22.0	20.5	20.5	20.0	21.0	20.5	20.5	20.0
	4	19.0	20.5	20.5	21.5	20.5	20.5	20.0	21.0	20.5	20.5	20.0
	5	19.0	20.0	20.0	21.0	20.0	20.0	19.5	20.0	20.0	20.0	19.5
SAMPLE 2 AREA 2	1	18.0	20.0	19.5	21.0	20.0	20.0	19.5	20.0	20.0	20.0	19.5
	2	18.0	20.0	19.5	20.5	20.0	20.0	19.5	20.0	20.0	20.0	19.5
	3	18.0	20.0	20.0	20.5	19.5	20.0	19.5	20.0	20.0	20.0	19.5
	4	18.0	20.0	20.5	21.0	20.0	19.5	19.5	20.0	20.0	20.0	19.5
	5	18.0	20.0	20.0	21.0	20.0	19.5	20.0	20.0	20.5	20.5	19.5
SAMPLE 3 AREA 3	1	19.0	20.0	20.0	21.0	20.5	20.0	20.0	20.5	20.5	20.5	19.5
	2	18.5	20.0	20.5	21.5	20.0	20.0	20.0	20.5	20.5	20.5	19.5
	3	18.5	20.0	20.5	21.0	20.0	20.0	20.0	20.5	21.0	20.5	20.0
	4	19.0	20.0	20.5	21.5	20.0	20.0	20.0	20.5	21.0	20.5	20.0
	5	18.5	20.0	20.5	22.0	20.0	20.0	20.0	20.5	21.0	20.5	20.0
SAMPLE 4 _____ _____	1											
	2											
	3											
	4											
	5											
SAMPLE 5 _____ _____	1											
	2											
	3											
	4											
	5											
INIT/QAQC		SD SG 1/30	SG 1/31	SG 2/1	SWD 2/2	SG 2/3	SG 2/4	SG 2/5	SG 2/6	SG 2/7	SWD 2/8	SD SG 2/9

SP-R

00026

AQUA SURVEY, INC
SOLID PHASE READINGS

CLIENT: Exxon Bayway TEST START: 1-30-92 PARAMETER: D.O.

JOB NUMBER: 92-91361 METER NUMBER:

SAMPLE ID	RP	00	1	2	3	4	5	6	7	8	9	10
CONTROL	1	6.8	6.2	6.8	6.4	6.8	6.4	6.5	6.4	6.5	6.8	6.8
	2	6.8	6.4	6.8	6.6	6.8	6.6	6.7	6.6	6.6	6.8	6.8
	3	7.0	6.0	6.8	6.6	6.4	6.6	6.6	6.4	6.4	6.2	5.8
REFERENCE	1	6.2	5.8	6.0	6.0	6.4	6.0	5.9	5.8	5.4	5.6	5.5
	2	6.8	6.4	6.8	6.6	6.8	6.6	6.6	6.4	6.4	6.7	6.7
	3	6.1	5.8	6.0	6.2	6.8	6.2	6.1	6.0	6.1	6.1	6.1
	4	6.8	6.5	7.1	7.0	6.8	6.6	6.6	6.4	6.4	7.0	6.8
	5	7.0	6.6	7.2	7.0	7.1	6.8	6.8	6.6	6.6	6.6	6.6
SAMPLE 1 AREA 1	1	6.1	6.0	6.5	6.4	6.6	6.2	6.1	6.0	6.2	6.4	6.2
	2	6.1	5.4	6.4	6.1	6.6	6.2	6.2	6.2	6.2	6.4	6.4
	3	6.6	6.2	6.6	6.1	6.6	6.4	6.4	6.4	6.4	6.6	6.5
	4	6.8	6.4	7.0	7.1	7.0	6.6	6.6	6.5	6.6	6.6	6.5
	5	6.0	5.6	6.3	6.2	6.6	6.4	6.6	6.1	6.2	6.4	6.4
SAMPLE 2 AREA 2	1	6.4	6.0	6.4	6.4	6.6	6.4	6.2	5.2	5.0	5.0	3.7
	2	6.6	6.0	6.5	6.4	6.6	6.4	6.5	6.0	6.2	6.4	6.3
	3	6.8	6.2	6.6	6.5	6.6	6.6	6.6	6.4	6.5	6.6	6.5
	4	5.0	6.2	6.7	6.6	7.0	6.6	6.6	6.2	6.6	6.8	6.7
	5	6.2	5.9	6.3	6.1	6.4	6.6	6.2	5.9	6.0	6.1	6.3
SAMPLE 3 AREA 3	1	6.1	5.8	5.9	5.9	6.2	6.0	6.0	5.7	5.8	5.3	4.4
	2	6.1	5.7	6.0	6.0	6.5	6.2	6.0	5.9	6.0	5.8	5.5
	3	5.8	5.9	5.6	5.4	5.8	6.4	5.4	6.2	6.4	5.4	5.4
	4	6.4	6.0	6.6	6.2	6.6	6.3	6.4	5.4	6.2	6.1	5.1
	5	6.4	5.8	6.4	6.1	6.4	6.6	6.4	6.0	6.2	6.4	6.4
SAMPLE 4	1											
	2											
	3											
	4											
	5											
SAMPLE 5	1											
	2											
	3											
	4											
	5											
INIT/QAQC		SS 1/30	SS 1/31	SS 2/1	SS 2/2	SS 2/3	SS 2/4	SS 2/5	SS 2/6	SS 2/7	SS 2/8	SS SS 2/9

SP-R

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 1·28·92 QA/QC: _____

TEST JOB #: 91-361 CLIENT: EXXON BAYWAY / NYTEST

IN-LAB [ ] MOBILE [✓] SATELLITE [ ]

TEST SPECIES: N. virens

Total Number of organisms acclimated: 480+

AQUA SURVEY, INC Investigators: JM, SG, WSO

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: Holding 92-0059
2. Procured From/Date Received: 92-0016 ARO 1·28·92
3. Age Information: MIXED ADULTS

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 12°C
2. Salinity: ~~DRY~~
3. Alkalinity: _____

C. HOLDING [✓] CULTURE [ ] WATER PARAMETERS

1. Temperature: _____
2. Salinity: _____ DRY
3. Alkalinity: _____
4. Water Source: _____

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): _____
2. Acclimation Water Type: _____
3. Acclimation Water Temperature: _____
4. Acclimation Water Salinity: _____ VOID
5. Acclimation Commencement - Date: _____ Time: _____
6. Change-Over Rate (ml/minute): _____
7. Culture Acclimation Ending-Date: _____ Time: _____
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 1·28·92 Time: 1130 AM
2. Temperature: 12°C
3. Salinity: ~~DRY~~
4. Alkalinity: _____
5. Culture Lab Technician Initials: _____ [Transfer]
6. Test Lab Technician Initials: _____ [Receiving]

REMARKS: 10 day Solid Phase

00028

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 1/30/92 QA/QC: _____

TEST JOB #: 91-361 CLIENT: Exxon Bayway / NyTest

IN-LAB [ ] MOBILE [/] SATELLITE [ ]

TEST SPECIES: P. pugio

Total Number of organisms acclimated: 2400+

AQUA SURVEY, INC Investigators: EJ JM

A. **ORGANISMS**

1. ASI Culture/Holding [Tank/Receiving Log #]: "Fifty" 92-0064
2. Procured From/Date Received: 92-0014 Aquatic Ind. 1/27/92
3. Age Information: Mixed Adults

B. **RECEIVING WATER PARAMETERS** (Non Cultured Organisms)

1. Temperature: 15.0°C
2. Salinity: 20 ppt
3. Alkalinity: 20's

C. **HOLDING** [/] **CULTURE** [ ] **WATER PARAMETERS**

1. Temperature: 26.0°C
2. Salinity: 29.0 ppt
3. Alkalinity: —
4. Water Source: Aquatic Indicators Water → To Forty Fathoms

D. **ACCLIMATION** [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 9l bag
2. Acclimation Water Type: Forty Fathoms
3. Acclimation Water Temperature: 25.0°C
4. Acclimation Water Salinity: 30.0 ppt
5. Acclimation Commencement - Date: 1/27/92 Time: 10:30 Am
6. Change-Over Rate (ml/minute): 15-20 ml/min
7. Culture Acclimation Ending-Date: 1/29/92 Time: 1100 Am
8. _____ Acclimation Ending-Date: _____ Time: _____

E. **TRANSFER CUSTODY & TRANSFER WATER PARAMETERS**

1. Culture Lab > Test Lab: -Date: 1/30/92 Time: 800 Am
2. Temperature: 26.0°C
3. Salinity: 29.0 ppt
4. Alkalinity: —
5. Culture Lab Technician Initials: JM / [Transfer]
6. Test Lab Technician Initials: / [Receiving]

REMARKS: 10 day Solid Phase

00029

A Q U A S U R V E Y I N C.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 1.28.92 QA/QC: _____

TEST JOB #: 91-361 CLIENT: EXXON BAYWAY / NYTEST

IN-LAB [ ] MOBILE [/] SATELLITE [ ]

TEST SPECIES: M. MERCENARIA

Total Number of organisms acclimated: 480†

AQUA SURVEY, INC Investigators: JM, SG, WSD

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: Holding Pool 92-0060
2. Procured From/Date Received: 92-0015-B R.F. CLEAMA 1.24.92
3. Age Information: MIXED ADULTS

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 15°—
2. Salinity: ~~DRY~~
3. Alkalinity: ~~DRY~~

C. HOLDING [/] CULTURE [ ] WATER PARAMETERS

1. Temperature: 15°—
2. Salinity: 30.0 ppt
3. Alkalinity: —
4. Water Source: MANASQUAN SEA WATER

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): _____
2. Acclimation Water Type: _____
3. Acclimation Water Temperature: _____
4. Acclimation Water Salinity: _____
5. Acclimation Commencement - Date: _____ Time: _____
6. Change-Over Rate (ml/minute): _____
7. Culture Acclimation Ending-Date: _____ Time: _____
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 1.28.92 Time: 1130AM
2. Temperature: 15°—
3. Salinity: 30.0 ppt
4. Alkalinity: —
5. Culture Lab Technician Initials: _____ [Transfer]
6. Test Lab Technician Initials: _____ [Receiving]

REMARKS: 10 day Solid Phase

00030

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR BIOASSAY

JOB #: 91-361 CLIENT EXXON/AREA 1
CLIENT: —
START DATE: 06 Feb 92 TIME: 1:00 PM
END DATE: 10 Feb 92 TIME: 12:00 PM

SPECIES: A. tonsa SOURCE In House
DILUTION WATER: Monterey
TEST VOLUME: 200 mL TEST TEMP. 20 ± 2°C

CONCENTRATION (%)	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	20	19	19	19	19
CONTROL B	20	20	20	19'	18'	18	16²
CONTROL C	20	20	18'	19	19	18'	17'
10% A	20	20	19	19	19	19	19
B	20	20	18	18	17	18	18
C	20	20	20	19	17	17	17
50% A	20	19*	13'*	14*	11*	9'*	2'
B	20	18*	17*	15*	10*	10*	3³
C	20	18*	16*	15*	11*	12*	4
100% A	20	15*	9'*	14*	2*	0²*	0'
B	20	10*	2²*	4*	1*	1*	0
C	20	7*	12*	8*	5²*	0*	0
NUO	✓	✓	✓	✓	✓	✓	✓
INITIALS	CV	CV	CV	CV	CV	CV	CV
DATE	02-06	02-06	02-07	02-07	02-08	02-09	02-10

(NUO = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED ABOVE)

NOTES: *Sample volume turbid - counts half estimates CV 02-09

SRT-LC.SW

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR BIOASSAY

JB # 72-361 CLIENT Exxon
START DATE 06Feb72 START TIME 12.00pm
END DATE 10Feb72 END TIME 12:00pm

SPECIES N. Tau82 SOURCE Sa.-Hous
DILUTION WATER Natural Sea
TEST VOLUME 200 mL TEST TEMP 20-22°C

SAMPLE ID	DISSOLVED OXYGEN (mg/l)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	6.3	6.0	6.5	6.3	6.4	18.0	17.0	17.0	17.0	17.0	7.9	8.0	8.1	8.1	8.2	28.0	28.0	29.0	29.0	29.0
CONTROL B	6.3				6.4	18.0				17.0	7.9				8.2	28.0				29.0
CONTROL C	6.3				6.3	18.0				17.0	7.9				8.2	28.0				29.0
10% A	6.1	6.5	6.4	6.3	6.3	18.0	17.0	17.0	18.5	17.0	7.7	8.0	8.2	8.1	8.2	28.0	28.0	29.0	29.0	29.0
B	6.1				6.5	18.0				17.0	7.7				8.2	28.0				29.0
C	6.1				6.3	18.0				17.0	7.7				8.3	28.0				29.0
50% A	6.0	6.5	6.4	6.4	6.3	18.0	18.0	18.5	18.5	17.0	7.7	8.0	8.4	8.4	8.5	28.0	28.0	28.0	28.5	28.0
B	6.0				6.3	18.0				17.0	7.7				8.6	28.0				28.0
C	6.0				6.4	18.0				17.0	7.7				8.5	28.0				28.0
100% A	6.0	6.5	6.3	6.1	6.3	18.0	18.5	18.5	18.5	17.0	7.6	7.7	8.4	8.5	8.6	28.0	27.5	27.5	28.0	27.5
B	6.0				6.1	18.0				17.0	7.6				8.7	27.0				27.5
C	6.0				6.2	18.0				17.0	7.6				8.7	27.0				27.5
INITIALS																				
DATE																				

00032

#1

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 2/6/92 QA/QC: _____

TEST JOB #: _____ CLIENT: _____

IN-LAB [✓] MOBILE [ ] SATELLITE [ ]

TEST SPECIES: Acartia tonsa

Total Number of organisms acclimated: 780

AQUA SURVEY, INC Investigators: DEN & ERIC

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: 19 & 4 L Bottle Cult.
2. Procured From/Date Received: N/A
3. Age Information: ~3 WEEKS OLD

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: N/D
2. Salinity: N/D
3. Alkalinity: _____

C. HOLDING [ ] CULTURE [✓] WATER PARAMETERS

1. Temperature: 20°C
2. Salinity: 16 ppt
3. Alkalinity: _____
4. Water Source: FILTERED MANASQUAN & MEL WELL DILUTION

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 19L Carboy
2. Acclimation Water Type: Filtered Manasquan
3. Acclimation Water Temperature: 20°C
4. Acclimation Water Salinity: 30 ppt
5. Acclimation Commencement - Date: 2/1/92 Time: 1000 HRS
6. Change-Over Rate (ml/minute): 5-10 ml/min average
7. Culture Acclimation Ending-Date: 2/5/92 Time: 1400 HRS
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 2/6/92 Time: 1145 HRS
2. Temperature: 21°C
3. Salinity: 28.5 ppt
4. Alkalinity: _____
5. Culture Lab Technician Initials: DB [Transfer]
6. Test Lab Technician Initials: [signature] [Receiving]

REMARKS: _____

00033

EPA PROBIT ANALYSIS PROGRAM
USED FOR CALCULATING EC VALUES
Version 1.4

-1-361 Exxon A. tonsa 96 hour LC50 Area 1

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Adjusted Proportion Responding	Predicted Proportion Responding
10.0000	60	6	0.1000	0.1000	0.0925
50.0000	60	51	0.8500	0.8500	0.8759
100.0000	60	60	1.0000	1.0000	0.9869

hi - Square Heterogeneity = 1.208

Mu = 1.373486
igma = 0.281827

Parameter	Estimate	Std. Err.	95% Confidence Limits
ntercept	0.126494	0.565186	(-0.981271, 1.234259)
Slope	3.548276	0.377811	(2.807766, 4.288785)

heoretical Spontaneous Response Rate = 0.0000

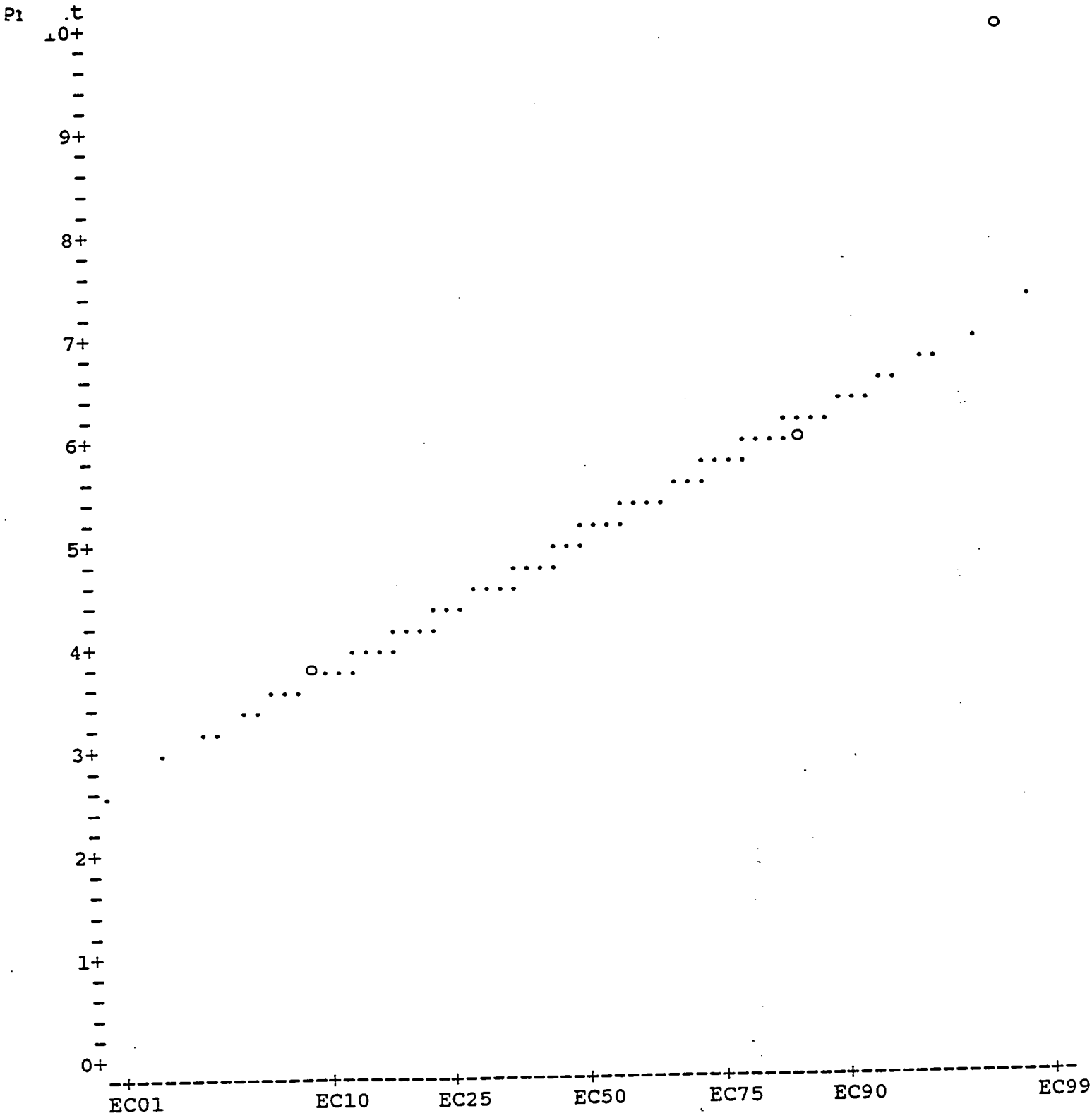
1-361 Exxon A. tonsa 96 hour LC50

Estimated EC Values and Confidence Limits

oint	Conc.	Lower 95% Confidence	Upper Limits
: 1.00	5.2224	3.2068	7.3000
: 5.00	8.1266	5.5316	10.6685
:C10.00	10.2872	7.3720	13.1060
:C15.00	12.0615	8.9299	15.0908
:50.00	23.6312	19.3710	28.3908
:85.00	46.2990	38.1137	58.8874
:C90.00	54.2844	44.1442	70.9137
:C95.00	68.7168	54.5680	93.9219
:99.00	106.9301	80.2837	160.9315

91-361 Exxon A. tonsa 96 hour LC50

PLOT OF ADJUSTED PROBITS AND PREDICTED REGRESSION LINE



OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon
SITE ID: Area 1
START DATE: 1/20/92
START TIME: 3:50 pm

SPECIES: M. bahia
TEST VOLUME: 1L
DILUTION WATER: Forty Fathoms
TEST TEMPERATURE: 20 ± 2°C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	20	20	20	20	20
CONTROL B	20	20	20	20	20	20	20
CONTROL C	20	20	20	20	20	20	20
10% A	20	20	20	20	20	18'	17
B	20	20	20	19'	19	19	19
C	20	20	20	20	20	20	20
50% A	20	20	20	20	20	20	16'
B	20	20	20	20	20	20	14
C	20	20	20	20	20	18'	17
100% A	20	17*	20*	20*	16 2*	0 7	—
B	20	19*	19*	19*	15 3*	1 8	0'
C	20	19*	20*	20*	17*	2 4	0'
MUD	✓	✓	✓	✓	✓	✓	✓
INITIALS	SD SG 1/20	SG 1/20	SG 1/21	SG 1/21	SG 1/22	SG 1/23	SG 1/24
QA/QC							

(MUD = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED BELOW)

NOTES:
* counts are estimates due to sample turbidity SG 1/20
8 hr. - partial loss of equilibrium SG 100% only
96 hr. - 1 in 5 DIA CLE

00037

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon
SITE ID: Area 1
START DATE: 1/20/92
START TIME: 2:50pm

SPECIES: M. bahia
TEST VOLUME: 1L
DILUTION WATER: F.C.M./F.C.Norms
TEST TEMPERATURE: 20 ± 2 °C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	DISSOLVED OXYGEN (mg/L)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	7.4	6.6	6.2	6.2	7.6	18.0	20.0	23.0	23.0	18.0	7.7	8.2	8.3	8.1	8.1	28.0	28.0	28.0	29.0	29.0
B	7.4				7.6	18.0				18.0	7.7				8.1	28.0				28.5
C	7.4				7.6	18.0				18.0	7.7				8.1	28.0				28.5
10% A	7.4	6.6	6.2	6.2	7.6	18.0	20.0	23.0	23.5	18.5	7.7	8.1	8.2	8.2	8.1	28.0	28.0	28.5	29.0	28.5
B	7.4				7.5	18.0				18.5	7.7				8.1	28.0				28.5
C	7.4				7.0	18.0				18.5	7.7				8.0	28.0				28.5
50% A	7.4	6.6	6.2	6.2	7.4	18.0	20.0	23.0	23.5	18.5	7.7	8.2	8.3	8.2	8.2	28.0	28.0	28.0	29.0	29.0
B	7.4				7.5	18.0				18.5	7.7				8.2	28.0				28.0
C	7.4				7.5	18.0				18.5	7.7				8.2	28.0				28.0
100% A	7.4	6.6	6.1	6.3	7.5	18.0	20.0	23.0	23.5	18.5	7.6	8.3	8.3	8.3	8.3	28.0	28.0	28.0	30.0	28.0
B	7.4				7.5	18.0				18.5	7.6				8.3	28.0				28.0
C	7.4				7.5	18.0				18.5	7.6				8.3	28.0				28.0
INITIALS	SG 1/20	SG 1/21	SG 1/22	SG 1/23	SD SG 1/24	SG 1/20	SG 1/21	SG 1/22	SG 1/23	SD SG 1/24	SG 1/20	SG 1/21	SG 1/22	SG 1/23	SD SG 1/24	SG 1/20	SG 1/21	SG 1/22	SG 1/23	SD SG 1/24
QA/QC																				

NOTES (ODOR, VISUAL DESCRIPTION):

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 1/20/92 QA/QC: _____

TEST JOB #: 91-361 CLIENT: EXXON

IN-LAB [ ] MOBILE [✓] SATELLITE [ ]

TEST SPECIES: M. bahia

Total Number of organisms acclimated: 300+

AQUA SURVEY, INC Investigators: DEN

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: _____
2. Procured From/Date Received: VOID
3. Age Information: HD 1/19/92 ; 1/17/92

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: VOID
2. Salinity: _____
3. Alkalinity: _____

C. HOLDING [ ] CULTURE [✓] WATER PARAMETERS

1. Temperature: 25°C
2. Salinity: 25 ppt
3. Alkalinity: _____
4. Water Source: 4C FATHAMS - AGED & WELL

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 19l
2. Acclimation Water Type: 40 FATHAMS
3. Acclimation Water Temperature: 24.5°C
4. Acclimation Water Salinity: 30 ppt
5. Acclimation Commencement - Date: 1/18/92 Time: 1100 HRS
6. Change-Over Rate (ml/minute): 10-15 ml/min AVE
7. Culture Acclimation Ending-Date: 1/20/92 Time: 0730 HRS
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 1/20/92 Time: 0815 HRS
2. Temperature: 24.5°C
3. Salinity: 29.5 ppt
4. Alkalinity: _____
5. Culture Lab Technician Initials: DB [Transfer]
6. Test Lab Technician Initials: _____ [Receiving]

REMARKS: _____

00039

Exxon M. bahia 96hr LC50 91-361 SMN

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
100	60	60	100	8.673618E-17
50	60	13	21.66667	6.073354E-04
1[illegible]	60	4	6.666667	4.542252E-11

THE BINOMIAL TEST SHOWS THAT 50 AND 100 CAN BE
USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS 99.99939 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 61.16455

>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	2.091926E-02		47.50932	41.12579
55.3027				

>>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
9	143.8488	43.29811	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.120579
95 PERCENT CONFIDENCE LIMITS =-34.30669 AND 40.54785

LC50 = 50.24121
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
LC1 = 9.024694
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon
SITE ID: Area 1
START DATE: 1/7c /92
START TIME: 5:25 pm

SPECIES: M. menidia
TEST VOLUME: 19 l
DILUTION WATER: Fort / Fathoms
TEST TEMPERATURE: 20 ± 2 °C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	20	20	20	20	20
CONTROL B	20	20	20	20	20	20	20
CONTROL C	20	20	20	20	20	20	20
10% A	20	20	20	20	20	20	20
B	20	20	20	20	20	20	20
C	20	20	20	20	20	20	20
50% A	20	TTC	TTC	TTC	TTC	TTC	20
B	20	"	20	20	20	19'	19
C	20	"	20	20	20	20	20
100% A	20	"	TTC 2	TTC 2	0 16	—	—
B	20	"	TTC 2	TTC 2	4 10 *	2 2	0 2
C	20	"	TTC 1	TTC 1	0 18 *	—	—
MUO	✓	✓	—	—	✓	✓	✓
INITIALS	SD 1/20	SD 1/20	SG 1/21	SG 1/21	SG 1/22	SG 1/23	SD 1/24
QA/QC							

(MUO = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED BELOW)

NOTES:
* Count is estimate due to Turbidity SG

00041

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon
SITE ID: Area 1
START DATE: 1/20/92
START TIME: 5:25 pm

SPECIES: M. menidia
TEST VOLUME: 19 L
DILUTION WATER: Forty Fathoms
TEST TEMPERATURE: 20±2°C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	DISSOLVED OXYGEN (mg/L)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	7.4	7.0	6.8	6.8	8.0	19.5	18.0	22.0	21.5	16.0	7.7	8.0	8.1	8.2	8.1	28.0	28.0	28.5	28.5	30.0
B	7.3	7.0	6.8	6.8	8.0	18.5	18.0	21.5	21.0	16.0	7.7	8.0	8.1	8.2	8.1	28.0	28.0	28.5	29.0	30.0
C	7.4	7.0	6.8	6.8	8.0	18.0	18.0	21.5	21.0	16.0	7.7	8.0	8.0	8.1	8.1	28.0	28.0	29.0	29.0	30.0
10% A	7.4	7.0	8 (1)	6.8	8.0	18.0	18.0	21.5	21.5	16.0	7.7	8.0	8.1	8.1	8.1	28.0	28.0	29.0	29.0	30.0
B	7.0	7.0	6.8	6.8	8.0	18.0	18.0	22.0	22.0	16.5	7.7	8.1	8.1	8.1	8.1	28.0	28.0	29.0	29.0	30.0
C	7.2	6.6	6.4	6.2	8.0	18.0	18.0	22.0	22.0	17.0	7.7	7.9	8.0	8.0	8.1	28.0	28.0	29.0	29.5	30.0
50% A	7.0	7.0	6.6	6.6	7.9	19.0	18.0	22.0	22.0	17.0	7.5	8.1	8.1	8.2	8.2	28.0	28.0	28.5	29.0	30.0
B	7.0	7.0	6.7	6.6	8.0	18.0	18.0	22.0	22.0	16.5	7.4	8.1	8.1	8.3	8.2	28.0	28.0	28.0	29.0	30.0
C	6.4	7.0	6.7	6.7	8.0	18.0	18.0	21.5	21.5	16.5	7.4	8.0	8.1	8.2	8.2	27.5	27.5	28.0	29.0	29.5
100% A	6.4	7.0	6.8	–	–	18.5	18.0	21.5	–	–	7.4	8.2	8.3	–	–	28.0	28.0	28.0	–	–
B	6.2	7.0	6.8	6.7	7.9	18.5	18.0	21.0	21.0	16.0	7.4	8.2	8.2	8.3	8.3	28.0	27.5	28.0	29.0	29.5
C	6.4	7.0	6.8	–	–	19.0	18.0	21.0	–	–	7.4	8.1	8.2	–	–	28.0	27.5	28.0	–	–
INITIALS	SD 1/16	SG 1/17	SG 1/18	SD 1/19	SD 1/20	SD 1/20	SG 1/21	SG 1/22	SG 1/23	DG 1/24	SG 1/20	SG 1/21	SG 1/22	SG 1/23	SD 1/24	SG 1/20	SG 1/21	SG 1/22	DG 1/23	SD 1/24
QA/QC																	1/21			

NOTES (ODOR, VISUAL DESCRIPTION):

(1) 6.8 SG mistake 1/22

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 1/20/92 QA/QC: _____

TEST JOB #: 91-361 CLIENT: Exxon Baytown

IN-LAB [ ] MOBILE [✓] SATELLITE [ ]

TEST SPECIES: M. menidia

Total Number of organisms acclimated: 240

AQUA SURVEY, INC Investigators: JM

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: 052 92-0035
2. Procured From/Date Received: 92-0012 Multi Aqua 1.17.92
3. Age Information: Mixed Adults

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 7.5°C
2. Salinity: 30.0 ppt
3. Alkalinity: —

C. HOLDING [✓] CULTURE [ ] WATER PARAMETERS

1. Temperature: 21.5°C
2. Salinity: 28.5 ppt
3. Alkalinity: —
4. Water Source: 4c FATHOM + IME WELL WATER

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 19 l Plastic Bags
2. Acclimation Water Type: 4c FATHOMS
3. Acclimation Water Temperature: 21.5°C
4. Acclimation Water Salinity: 28.5 ppt
5. Acclimation Commencement - Date: 1/18/92 Time: 0900 HRS
6. Change-Over Rate (ml/minute): 15-20 ml/min.
7. Culture Acclimation Ending-Date: 1/19/92 Time: 1400 HRS
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 1/20/92 Time: 0815 HRS
2. Temperature: 21.5°C
3. Salinity: 28.5 ppt
4. Alkalinity: —
5. Culture Lab Technician Initials: JM/DB [Transfer]
6. Test Lab Technician Initials: _____ [Receiving]

REMARKS: _____

00043

Rep 1 Exxon 91-361 SPP. M. meredica 96 hr LC50

ONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
.00	60	60	100	8.673618E-17
0	60	1	1.666667	5.290907E-15
1C	60	0	0	8.673618E-17

'H. INOMIAL TEST SHOWS THAT 50 AND 100 CAN BE
:ED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
)NFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
.SSOCIATED WITH THESE LIMITS IS 100 PERCENT.
'I APPROXIMATE LC50 FOR THIS SET OF DATA IS 69.07884

.,IEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT
)EAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE
:OBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR BIOASSAY

JOB #: 92-301 CLIENT EXXON
CLIENT: — AREA 2
START DATE: 06 Feb 92 TIME: 11:05 am
END DATE: 10 Feb 92 TIME: 12:25 pm

SPECIES: A. Tonsa SOURCE In-House
DILUTION WATER: Manzanillo
TEST VOLUME: 200 mL TEST TEMP. 20 ± 2°C

CONCENTRATION (%)	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	20	20	19	19	19
CONTROL B	20	20	19'	19	18'	18	18
CONTROL C	20	20	20	19	17²	17	17
10% A	20	20	20	18²	17'	17	14'
B	20	20	19	19	18	18	16'
C	20	20	20	18	19	19	19
50% A	20	19*	17*	19*	19*	19*	15'
B	20	19*	17*	13*	16*	17*	16⁴
C	20	20*	20*	18*	15*	16*	9⁷
100% A	20	16*	15*	12²*	10*	8'*	2*
B	20	19*	12*	10²*	7*	8*	0⁶
C	20	20*	15*	10³*	3'*	4*	0²
NUO	✓	✓	✓	✓	✓	✓	✓
INITIALS	CV	CV	CV	CV	CV	CV	CV
DATE	02-06	02-06	02-07	02-07	02-08	02-09	02-10

(NUO = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED ABOVE)

NOTES: * SAMPLE TURBID
COLOR ALE
ESTIMATE CV 2-6-92

SRT-LC.SW

#2

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR BIOASSAY

92-361 CLIENT EXXON

START DATE 06/06/92 START TIME 12:05 pm

END DATE 06/10/92 END TIME 12:25 pm

SPECIES M. Texana SOURCE In-House

DILUTION WATER Manasquan

TEST VOLUME 20 L TEST TEMP 20 ± 2° C

SAMPLE ID	DISSOLVED OXYGEN (mg/l)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	6.4	6.5	6.4	6.3	6.2	18.5	19.0	19.0	19.0	19.0	7.9	8.1	8.2	8.2	8.3	28.0	28.5	28.5	29.0	29.0
CONTROL B	6.4				6.3	18.5				19.0	7.9				8.3	28.0				29.0
CONTROL C	6.4				6.3	18.5				19.0	7.9				8.3	28.0				29.0
10% A	6.3	6.0	6.3	6.3	6.2	18.5	19.5	19.0	19.0	19.0	7.9	8.0	8.3	8.3	8.3	28.0	28.5	28.0	28.5	28.5
B	6.3				6.2	18.5				19.0	7.9				8.3	27.0				27.0
C	6.3				6.2	18.5				19.0	7.9				8.3	28.0				28.5
50% A	6.3	6.2	6.3	6.2	6.2	18.0	19.0	18.5	19.0	19.0	7.9	8.0	8.3	8.3	8.6	27.5	27.5	27.5	28.0	28.5
B	6.3				6.2	18.0				19.0	7.9				8.6	27.5				28.0
C	6.3				6.2	18.0				19.0	7.9				8.6	28.5				28.0
100% A	6.1	6.3	6.3	6.3	6.2	18.0	19.5	18.5	19.0	19.0	7.8	8.1	8.3	8.3	8.7	27.0	27.5	27.5	28.0	28.5
B	6.1				6.1	18.0				18.5	7.8				8.7	27.0				28.5
C	6.1				6.1	18.0				18.5	7.8				8.7	27.0				28.5
INITIALS	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV
DATE	6-6	6-7	6-8	6-9	6-10	6-6	6-7	6-8	6-9	6-10	6-6	6-7	6-8	6-9	6-10	6-6	6-7	6-8	6-9	6-10

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:ONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
100	60	58	96.66666	1.588139E-13
F	60	20	33.33334	.6744646
1	60	11	18.33333	3.78064E-05

HE BINOMIAL TEST SHOWS THAT 50 AND 100 CAN BE
.SED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
:ONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
SSOCIATED WITH THESE LIMITS IS 99.32553 PERCENT.
N APPROXIMATE LC50 FOR THIS SET OF DATA IS 58.3519

>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

PAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	3.760107E-02		42.01433	34.56257

51.29287

>>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

TERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	87.93246	29.47566	0

. PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
"SING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.031701
95 PERCENT CONFIDENCE LIMITS =-17.02003 AND 21.08344

.C50 = 38.41792
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
T.C1 = 2.749741
F ERCENT CONFIDENCE LIMITS = 0 AND + INFINITY

EPA PROBIT ANALYSIS PROGRAM
USED FOR CALCULATING EC VALUES
Version 1.4

91-361 Exxon A. tonsa 96 hour LC50

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Adjusted Proportion Responding	Predicted Proportion Responding
10.0000	60	11	0.1833	0.1833	0.1175
50.0000	60	20	0.3333	0.3333	0.5919
100.0000	60	58	0.9667	0.9667	0.8007

Chi - Square Heterogeneity = 29.475

****
* WARNING *
*
* Significant heterogeneity exists. The results reported *
* for this data set may not be valid. The results should *
* be interpreted with appropriate caution. *
****

****
* NOTE *
*
* Slope not significantly different from zero. *
* EC fiducial limits cannot be computed. *
****

u = 1.584534
Sigma = 0.492201

arameter	Estimate	Std. Err.	95% Confidence Limits
Intercept	1.780716	2.498960	(-29.971067, 33.532501)
Slope	2.031691	1.499414	(-17.019867, 21.083248)

heoretical Spontaneous Response Rate = 0.0000

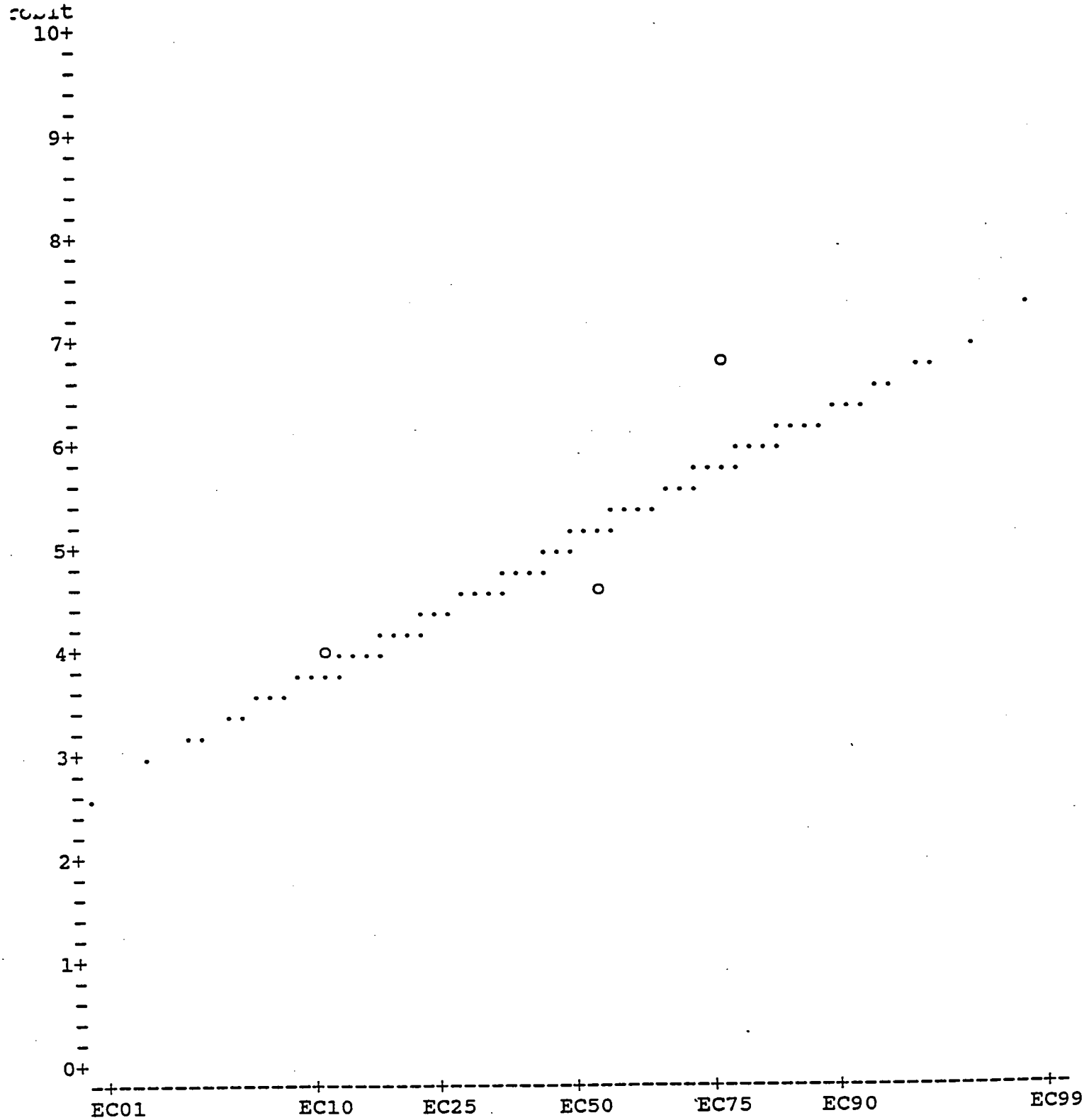
)1-361 Exxon A. tonsa 96 hour LC50

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence	Upper Limits
EC 1.00	2.7512		
EC 5.00	5.9554		
EC10.00	8.9894		
EC15.00	11.8691		
EC50.00	38.4180		
EC85.00	124.3515		
EC90.00	164.1871		
EC95.00	247.8308		
EC99.00	536.4646		

1-361 Exxon A. tonsa 96 hour LC50

PLOT OF ADJUSTED PROBITS AND PREDICTED REGRESSION LINE



OCEAN DISPOSAL BIOASSAY

JOB #: 92-913161
CLIENT: Exxon Baytown
SITE ID: Area #2
START DATE: 02-11-92
START TIME: 12:45

SPECIES: M. bahia
TEST VOLUME: 1L
DILUTION WATER: Forty Fathoms
TEST TEMPERATURE: 20 ± 2°C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	20	20	20	20	20
CONTROL B	20	20	20	20	20	20	20
CONTROL C	20	20	20	20	19'	19	19
10% A	20	20	20	20	20	19'	19
B	20	20	20	20	20	20	20
C	20	20	20	19'	19	18'	18
50% A	20	20	19'	19	19	19	19
B	20	20	19'	19	19	19	19
C	20	20	17[3]	17*	17	17	17
100% A	20	20*	18'*	18*	11[6]*	7[2]*	4[3]
B	20	20*	16[3]* (D)	17*	8[3]*	6[2]*	1[3]
C	20	20*	19'*	19*	8[7]*	4[2]*	0[4]
MUO	✓	✓	✓	✓	✓	✓	✓
INITIALS	SG 2-11	SG 2-11	SG 2-12	SG 2-12	SG 2-13	SG 2-14	SG 2-15
QA/QC							

(MUO = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED BELOW)

NOTES:

* Counts are difficult due to sample turbidity SG

Omniscant SG

00051

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon Bayway
SITE ID: Area # 2
START DATE: 02-11-92
START TIME: 12:45

SPECIES: M. bahia
TEST VOLUME: 1l
DILUTION WATER: Forty Fathoms
TEST TEMPERATURE: 20 ± 2°C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	DISSOLVED OXYGEN (mg/l)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	7.0	7.3	7.4	7.2	6.8	20.0	20.5	19.0	21.0	20.5	7.8	8.1	8.2	8.2	8.1	30.0	31.0	31.0	31.5	31.5
B	7.0				6.7	20.0				20.5	7.8				8.1	30.0				31.5
C	7.0				6.7	20.0				20.5	7.8				8.0	30.0				31.5
10% A	7.0	7.3	7.2	7.2	6.8	20.5	20.5	19.0	20.5	20.5	7.8	8.1	8.2	8.1	8.0	30.0	31.0	32.0	32.0	31.0
B	7.0				6.6	20.5				20.5	7.8				8.0	30.0				31.5
C	7.0				6.6	20.5				20.0	7.8				8.0	30.0				31.5
50% A	7.0	7.4	7.4	7.4	6.6	20.0	20.5	19.0	21.0	20.5	7.7	8.2	8.2	8.2	8.1	29.5	30.5	31.0	32.0	31.0
B	7.0				6.6	20.0				20.5	7.7				8.1	29.5				31.0
C	7.0				6.6	20.0				20.0	7.7				8.1	29.5				31.0
100% A	7.0	7.4	7.3	7.3	6.6	19.0	20.5	19.0	21.0	20.5	7.7	8.2	8.3	8.3	8.2	29.0	30.5	31.0	31.0	31.0
B	7.0				6.6	19.0				20.5	7.7				8.2	29.0				31.0
C	7.0				6.6	19.0				20.5	7.7				8.2	29.0				31.0
INITIALS	SG 2-11	SG 2-12	SG 2-13	SG 2-14	SG 2-15	SG 2-11	SG 2-12	SG 2-13	SG 2-14	SG 2-15	SG 2-11	SG 2-12	SG 2-13	SG 2-14	SG 2-15	SG 2-11	SG 2-12	SG 2-13	SG 2-14	SG 2-15
QA/QC																				

NOTES (COLOR, VISUAL DESCRIPTION):

00052

EPA PROBIT ANALYSIS PROGRAM
USED FOR CALCULATING EC VALUES
Version 1.4

Exxon Bayway 91-361 Area 2 M. bahia SPP

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Adjusted Proportion Responding	Predicted Proportion Responding
10.0000	60	3	0.0500	0.0500	0.0043
50.0000	60	5	0.0833	0.0833	0.3589
100.0000	60	55	0.9167	0.9167	0.7302

Chi - Square Heterogeneity = 59.431

****
* WARNING *
* *
* Significant heterogeneity exists. The results reported *
* for this data set may not be valid. The results should *
* be interpreted with appropriate caution. *
****

****
* NOTE *
* *
* Slope not significantly different from zero. *
* EC fiducial limits cannot be computed. *
****

Mu = 1.810581
Sigma = 0.308776

Parameter	Estimate	Std. Err.	95% Confidence Limits
Intercept	-0.863740	7.975006	(-102.194160, 100.466682)
Slope	3.238595	4.362121	(-52.186520, 58.663708)

Theoretical Spontaneous Response Rate = 0.0000

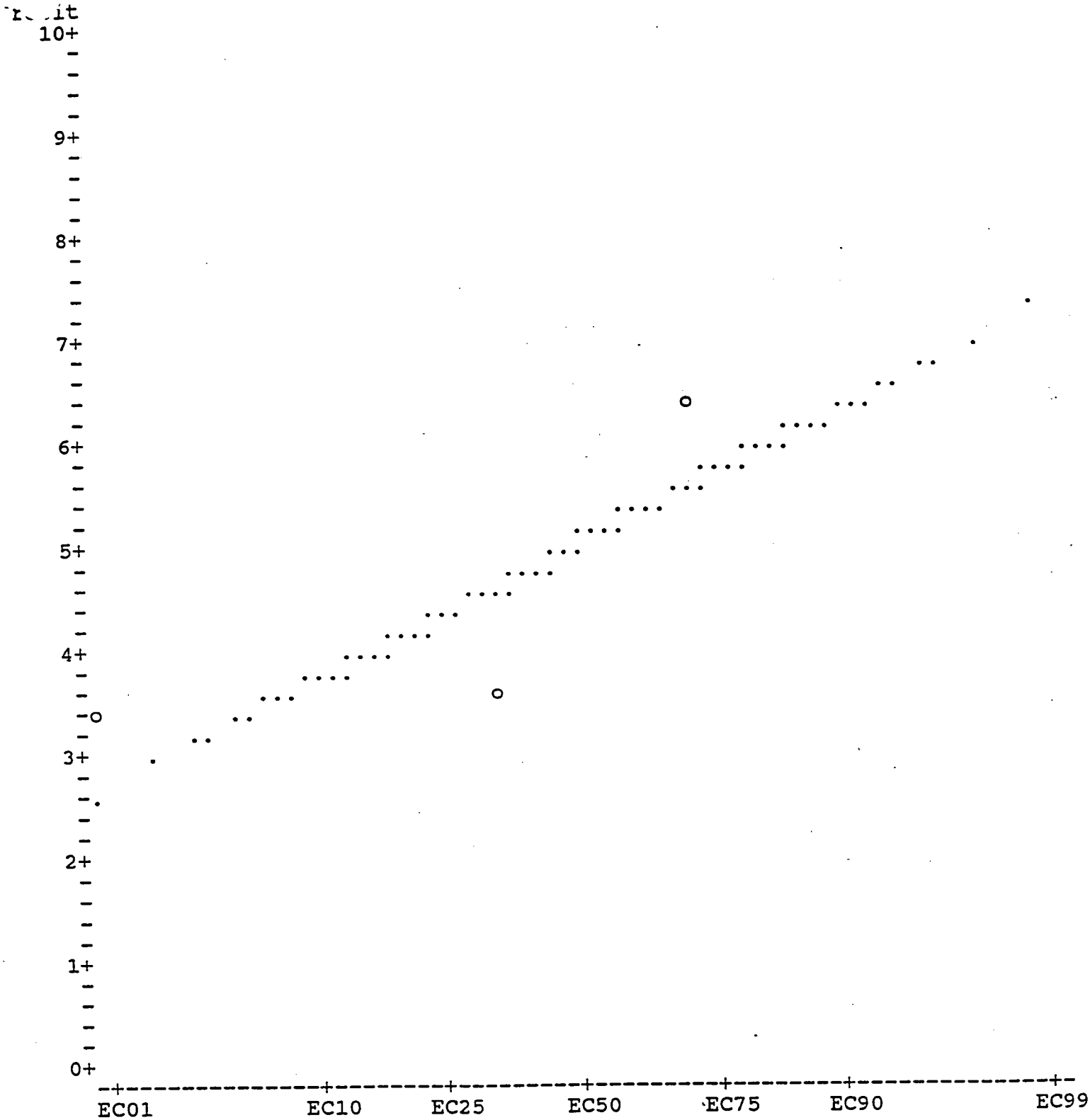
xxon Bayway 91-361 Area 2 M. bahia SPP

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence Limits	Upper 95% Confidence Limits
C 1.00	12.3673		
C 5.00	20.0759		
EC10.00	25.9929		
EC15.00	30.9433		
C50.00	64.6519		
EC85.00	135.0817		
EC90.00	160.8084		
EC95.00	208.2030		
C99.00	337.9769		

'xxon Bayway 91-361 Area 2 M. bahia SPP

PLOT OF ADJUSTED PROBITS AND PREDICTED REGRESSION LINE



Exxon Bayway Area 2 M. bahia 96hr LC50 SPP

ONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
100	60	55	91.66667	5.191332E-10
5	60	5	8.333334	5.191332E-10
1.	60	3	5	3.126926E-12

HE BINOMIAL TEST SHOWS THAT 50 AND 100 CAN BE
JSED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
SSOCIATED WITH THESE LIMITS IS 100 PERCENT.
N APPROXIMATE LC50 FOR THIS SET OF DATA IS 70.71067

>>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

PAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	3.022958E-02		70.71056	58.70243
88.28731				

>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
17	292.7564	59.41794	0

PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
SING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.238719
95 PERCENT CONFIDENCE LIMITS =-52.17617 AND 58.65361

LC50 = 64.65226
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
LC1 = 12.36387
P ERCENT CONFIDENCE LIMITS = 0 AND + INFINITY

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 2/11/93 QA/QC: _____

TEST JOB #: 93-91361 CLIENT: Exxon / NYTEST

IN-LAB [ ] MOBILE [✓] SATELLITE [ ]

TEST SPECIES: M. bahia

Total Number of organisms acclimated: ~~240~~ 240

AQUA SURVEY, INC Investigators: EJ CM

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: "M" System 92-0088
2. Procured From/Date Received: ASI
3. Age Information: HO 2/10/93

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: _____
2. ~~Salinity:~~ N/A
3. Alkalinity: _____

C. HOLDING [ ] CULTURE [✓] WATER PARAMETERS

1. Temperature: 23.5°C
2. Salinity: 30.0ppt
3. Alkalinity: —
4. Water Source: 40 Fathom

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): _____
2. Acclimation Water Type: _____
3. Acclimation Water Temperature: _____
4. Acclimation Water Salinity: _____
5. Acclimation Commencement - Date: _____ Time: _____
6. Change-Over Rate (ml/minute): _____
7. Culture Acclimation Ending-Date: _____ Time: _____
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 2/11/93 Time: 0800 HRS
2. Temperature: 23.5°C
3. Salinity: 30.0ppt
4. Alkalinity: —
5. Culture Lab Technician Initials: MVHB [Transfer]
6. Test Lab Technician Initials: SK [Receiving]

REMARKS: S.P.P. 96 hr

00057

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon Bayway
SITE ID: Area #2
START DATE: 4/1/92
START TIME: 11:40 AM

SPECIES: M. meridia
TEST VOLUME: 19L
DILUTION WATER: Forty Fathoms
TEST TEMPERATURE: 20 ± 2°C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	20	20	20	20	20
CONTROL B	20	20	20	20	20	20	20
CONTROL C	20	20	20	20	20	20	20
10% A	20	20	20	20	20	20	20
B	20	20	20	20	20	20	20
C	20	20	20	20	20	20	20
50% A	20	TTTC	18 [2]	18	18	16 [2]	15 [1]
B	20	|	20	20	20	20	20
C	20	|	20	20	19 [1]	19	19
100% A	20	|	1 [19]	0 [1]	—	—	—
B	20	|	7 [12]	6 [1]	07	—	—
C	20	—	1 [19]	1	0 [1]	—	—
NUD	✓	✓	✓	✓	✓	✓	✓
INITIALS	SG 4/1	SG 4/1	SG 4.2	SG 4.2	SG 4.3	SG 4.4	SG 4.5
QA/QC							

(NUD = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED BELOW)

NOTES:

TTTC - To Turbid To Count

00058

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon Bayway
SITE ID: Area #2
START DATE: 4/1/92
START TIME: 11:40 Am

SPECIES: M. menidia
TEST VOLUME: 19 L
DILUTION WATER: Filtered Fathoms
TEST TEMPERATURE: 20±2 °C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	DISSOLVED OXYGEN (mg/L)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	7.4	7.1	7.4	7.4	7.4	20.0	22.0	20.0 ①	20.0	21.0	7.6	7.9	7.9	8.0	8.0	31.0	31.0	31.0	31.5	32.0
B	7.4	7.0	7.4	7.4	7.4	19.5	22.0	20.0	19.5	21.0	7.6	7.9	7.9	8.0	8.0	31.0	31.0	31.0	31.5	32.0
C	7.4	7.1	7.4	7.4	7.4	19.5	22.0	19.5	19.5	20.5	7.6	7.9	7.9	7.9	8.0	31.0	31.0	31.0	31.5	31.0
10% A	7.2	7.1	7.4	7.4	7.4	20.0	22.0	19.5	19.5	20.0	7.4	7.4	7.9	8.0	8.0	31.0	31.0	31.0	31.5	32.0
B	7.2	7.1	7.5	7.4	7.4	20.0	21.5	19.0	19.0	19.5	7.4	7.9	7.9	7.9	8.0	30.5	31.0	31.0	31.5	32.0
C	7.1	7.1	7.4	7.4	7.4	20.5	21.0	18.5	19.0	19.0	7.4	8.0	7.9	7.9	8.0	30.5	31.0	31.0	31.5	32.0
50% A	6.6	7.2	7.4	7.4	7.4	20.5	21.5	18.5	19.0	19.0	7.1	8.1	7.9	8.0	8.1	30.0	30.5	31.0	31.5	32.0
B	6.6	7.1	7.4	7.4	7.5	21.0	21.5	19.0	18.5	19.0	7.1	7.9	7.8	8.0	8.0	30.5	31.0	31.0	31.0	31.5
C	6.6	7.1	7.3	7.3	7.4	21.0	21.5	19.5	18.0	19.0	7.1	8.0	7.9	8.0	8.0	30.5	30.5	31.0	31.5	32.0
100% A	5.4	7.1	—	—	—	22.0	21.5	—	—	—	6.7	8.1	—	—	—	29.5	30.0	—	—	—
B	5.8	7.2	7.4	—	—	22.0	21.0	19.0	—	—	6.8	8.1	8.0	—	—	30.0	30.5	30.5	—	—
C	6.2	7.2	7.4	—	—	22.0	21.0	19.0	—	—	6.8	8.2	8.0	—	—	30.0	30.5	30.5	—	—
INITIALS	SG 4.1	SG 4.2	SG 4.3	SG 4.4	SG 4.5	SG 4.1	SG 4.2	SG 4.3	SG 4.4	SG 4.5	SG 4.1	SG 4.2	SG 4.3	SG 4.4	SG 4.5	SG 4.1	SG 4.2	SG 4.3	SG 4.4	SG 4.5
QA/QC																				

NOTES (ODOR, VISUAL DESCRIPTION):

① 20 C SG 4.3 Mistake

00059

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
100	60	60	100	8.673618E-17
5	60	6	10	4.861481E-09
1	60	0	0	8.673618E-17

HE BINOMIAL TEST SHOWS THAT 50 AND 100 CAN BE
SED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
SSOCIATED WITH THESE LIMITS IS 100 PERCENT.
N APPROXIMATE LC50 FOR THIS SET OF DATA IS 65.33123

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT
EAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE
ROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR BIOASSAY

JOB #: 92-361 CLIENT: Exxon
CLIENT: — AREA 3
START DATE: 06 Feb 92 TIME: 12:10 pm
END DATE: 10 Feb 92 TIME: 12:45 pm

SPECIES: A. tonsa SOURCE: L. Hulse
DILUTION WATER: Marine Biota
TEST VOLUME: 20 mL TEST TEMP: 20 ± 2°C

CONCENTRATION (%)	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	19'	18'	18	18	18
CONTROL B	20	20	19'	19	19'	19	16'
CONTROL C	20	20	20	20	19'	19	17²
12% A	20	20	19'	19	18	18	18
B	20	20	18'	19	19	19	16³
C	20	20	20	20	20	20	19
10% A	20	20	19	18	17'	18	15'
B	20	20	20	18²	18	18	18
C	20	20	20	19'	18	18	13³
50% A	20	17*	14*	12'*	5²*	0⁴*	0
B	20	20*	13'*	11*	7'*	2*	0
C	20	19*	17*	13*	1*	0*	0
100% A	20	5*	2*	3-	0*	0	—
B	20	10*	8*	4-	0*	0	—
C	20	9*	8*	4*	0*	0	—
NUO	✓	✓	✓	✓	✓	✓	✓
INITIALS	CV	CV	CV	CV	CV	CV	CV
DATE	02-06	02-06	02-07	02-07	02-08	02-09	02-10

NOTES: ¹ Bradley Turbin
counted as
estimated C/ 2-6-92

(NUO = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED ABOVE)

SRT-LC.SW

#3

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR BIOASSAY

JOB # 92-361 CLIENT Exxon SPECIES A. tonsa SOURCE Dakoe

START DATE 06 Feb 92 START TIME 12:10 pm DILUTION WATER Nasaqua

END DATE 10 Feb 92 END TIME 12:40 pm TEST VOLUME 200 mL TEST TEMP. 26-27°C

SAMPLE ID	DISSOLVED OXYGEN (mg/l)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	6.3	6.5	6.1	6.2	6.3	18.5	19.5	19.0	19.0	19.5	7.9	8.1	8.2	8.2	8.3	28.0	28.0	28.0	28.0	28.0
CONTROL B	6.3				6.2	18.5				19.0	7.9				8.3	28.0				28.0
CONTROL C	6.3				6.2	18.5				19.5	7.9				8.3	28.0				28.5
1% A	6.2	6.4	6.1	6.2	6.2	18.5	19.5	19.0	19.0	19.5	7.9	8.1	8.2	8.2	8.3	28.0	28.0	28.0	28.0	28.5
B	6.2				6.2	18.5				19.0	7.9				8.3	28.0				28.0
C	6.2				6.1	18.5				18.5	7.9				8.3	28.0				28.0
10% A	6.2	6.4	6.1	6.0	6.1	18.5	19.5	19.0	19.0	19.0	7.9	8.1	8.2	8.2	8.4	28.0	28.0	28.0	28.0	28.0
B	6.2				6.1	18.5				18.5	7.9				8.4	28.0				28.0
C	6.2				6.1	18.5				18.5	7.9				8.4	28.0				28.0
50% A	6.0	6.4	6.1	6.1	6.1	18.0	19.5	18.5	19.0	18.5	7.7	8.2	8.5	8.5	8.6	27.5	28.0	28.0	28.5	28.0
B	6.0				6.1	18.0				18.5	7.7				8.6	27.5				28.0
C	6.0				6.2	18.0				18.5	7.7				8.6	28.5				28.0
100% A	5.9	6.4	6.1	6.1	6.0	18.0	19.5	18.5	19.0	18.5	7.6	8.0	8.5	8.6	8.7	27.5	28.0	28.5	28.0	28.5
B	5.9				5.9	18.0				18.5	7.6				8.8	27.5				28.0
C	5.9				6.1	18.0				18.5	7.6				8.8	27.5				28.5
INITIALS	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV
DATE	2-7	2-8	2-8	2-9	2-10	2-6	2-7	2-8	2-9	2-10	2-6	2-7	2-8	2-9	2-10	2-6	2-7	2-8	2-9	2-10

#3

ONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
100	60	60	100	8.673618E-17
5C	60	60	100	8.673618E-17
1	60	14	23.33334	2.111852E-03
1	60	7	11.66667	3.835959E-08

HE BINOMIAL TEST SHOWS THAT 10 AND 50 CAN BE
ISED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
ONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
SSOCIATED WITH THESE LIMITS IS 99.99789 PERCENT.
N APPROXIMATE LC50 FOR THIS SET OF DATA IS 15.61509

>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

PAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	2.406841E-02	10.47914	8.056688	
13.77873				

>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
8	3.918358	19.83942	0

PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
SING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 1.869827
95 PERCENT CONFIDENCE LIMITS =-1.831466 AND 5.57112

LC50 = 9.67719
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
C1 = .5512661
ERCENT CONFIDENCE LIMITS = 0 AND 9.354885

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon Baytk./
SITE ID: Arco #3
START DATE: 3/3/92
START TIME: 1:00pm

SPECIES: M. bahia
TEST VOLUME: 1L
DILUTION WATER: 40 Fathoms
TEST TEMPERATURE: 20°C ± 2
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	20	20	20	20	19
CONTROL B	20	20	20	20	19	20 (1)	19
CONTROL C	20	20	20	20	20	20	20
10% A	20	20	20	20	20	20	20
B	20	20	20	20	20	20	18
C	20	20	20	20	20	20	20
50% A	20	20 *	20 *	19 *	11^{4} *	9^{1}	5^{1}
B	20	20 *	19 *	19 *	16^{2} *	13^{1}	11^{1}
C	20	20 *	20 *	20 *	15^{3} *	7^{4}	6
100% A	20	TTC	15^{1} *	13^{3} *	0^{12}	—	—
B	20	TTC	8^{5} *	8^{2} *	0^{10}	—	—
C	20	TTC	6^{9} *	6^{4} *	0^{4}	—	—
NAD	✓	✓	✓	✓	✓	✓	✓
INITIALS	SG 3/3	SG 3/3	SG 3/4	SG 3/4	SG 3/5	SG 3/6	SG 3/7
QA/QC							

(NAD = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED BELOW)

NOTES:

* Counts difficult due to sample turbidity
(1) Conc B 48 hr. miscount SG

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon Baytown
SITE ID: Area #3
START DATE: 3/3/92
START TIME: 1:00pm

SPECIES: M. bahia
TEST VOLUME: 1L
DILUTION WATER: 40 Fathoms
TEST TEMPERATURE: 20°C ± 2
PHASE: LIQUID _____ SUSPENDED PARTICULATE L

SAMPLE ID	DISSOLVED OXYGEN (mg/L)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	7.5	7.2	6.6	6.2	7.0	19.5	22.0	22.0	21.5	20.0	7.9	8.0	8.1	8.0	8.2	29.0	28.0	29.0	30.5	33.0
B	7.5				6.8	19.5				20.5	7.9				8.1	29.0				35.0
C	7.5				6.8	19.5				20.0	7.9				8.1	29.0				32.0
10% A	7.4	7.0	6.6	6.1	6.7	19.5	22.0	22.0	22.0	20.0	7.8	8.0	8.2	8.1	8.1	29.0	29.0	30.0	34.0	36.0
B	7.4				6.8	19.5				20.0	7.8				8.2	29.0				33.0
C	7.4				6.8	19.5				20.5	7.8				8.2	29.0				32.0
50% A	7.3	7.2	6.6	6.2	6.8	19.5	22.0	22.0	21.5	20.0	7.5	8.2	8.3	8.1	8.3	28.0	29.0	29.0	35.0	35.0
B	7.3				6.9	19.5				20.0	7.5				8.3	28.0				34.0
C	7.3				6.8	19.5				20.0	7.5				8.3	28.0				33.0
100% A	7.2	7.2	6.6	—	—	18.5	22.0	22.0	—	—	7.4	8.3	8.4	—	—	28.0	28.0	28.0	—	
B	7.2		6.6	—	—	18.5		21.5	—	—	7.4		8.3	—	—	28.0		28.5	—	—
C	7.2		6.6	—	—	18.5		21.5	—	—	7.4		8.4	—	—	28.0		29.0	—	—
INITIALS																				
QA/QC																				

NOTES (ODOR, VISUAL DESCRIPTION):

EPA PROBIT ANALYSIS PROGRAM
USED FOR CALCULATING EC VALUES
Version 1.4

Exxon Bayway 91-361 Area 2 M. bahia SPP

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Adjusted Proportion Responding	Predicted Proportion Responding
10.0000	60	3	0.0500	0.0500	0.0043
50.0000	60	5	0.0833	0.0833	0.3589
100.0000	60	55	0.9167	0.9167	0.7302

Chi - Square Heterogeneity = 59.431

****
* WARNING *
* *
* Significant heterogeneity exists. The results reported *
* for this data set may not be valid. The results should *
* be interpreted with appropriate caution. *
****

****
* NOTE *
* *
* Slope not significantly different from zero. *
* EC fiducial limits cannot be computed. *
****

Mu = 1.810581
Sigma = 0.308776

Parameter	Estimate	Std. Err.	95% Confidence Limits
Intercept	-0.863740	7.975006	(-102.194160, 100.466682)
Slope	3.238595	4.362121	(-52.186520, 58.663708)

Theoretical Spontaneous Response Rate = 0.0000

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 3/3/92 QA/QC: _____

TEST JOB #: 92-91361 CLIENT: EXXON / NYTEST

IN-LAB [ ] MOBILE [✓] SATELLITE [ ]

TEST SPECIES: M. BAHIA

Total Number of organisms acclimated: 240

AQUA SURVEY, INC Investigators: EC

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: ACCLIMATION RACK 92-0153
2. Procured From/Date Received: ASI
3. Age Information: < 5 day HD 3/2/92

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: _____
2. Salinity: N/A
3. Alkalinity: _____

C. HOLDING [ ] CULTURE [✓] WATER PARAMETERS

1. Temperature: 20°C
2. Salinity: 28.0 ppt
3. Alkalinity: —
4. Water Source: Forty Fathoms

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): _____
2. Acclimation Water Type: N/A
3. Acclimation Water Temperature: _____
4. Acclimation Water Salinity: _____
5. Acclimation Commencement - Date: _____ Time: _____
6. Change-Over Rate (ml/minute): _____
7. Culture Acclimation Ending-Date: _____ Time: _____
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 3-3-92 Time: 845AM
2. Temperature: 20.0°C
3. Salinity: 28.0 ppt
4. Alkalinity: —
5. Culture Lab Technician Initials: DB [Transfer]
6. Test Lab Technician Initials: [Receiving]

REMARKS: 96 HR STATIC

00067

96 hr LC50 M. ~~meridia~~ bahia Area 3

ONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
?	60	60	100	8.673618E-17
?	60	38	63.33333	2.594695
10	60	2	3.333334	1.588139E-13

THE BINOMIAL TEST SHOWS THAT 10 AND 100 CAN BE USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 100 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 37.09146

>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

PAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	.0186783	33.26577	28.82809	38.1267

>>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
7	14.36596	5.534111	1.864892E-02

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.838249
95 PERCENT CONFIDENCE LIMITS =-10.70965 AND 18.38615

LC50 = 35.58872
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
LC1 = 8.812536
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon Baytown
SITE ID: Area #3
START DATE: 3/3/92
START TIME: 12:40pm

SPECIES: M. menidia
TEST VOLUME: 19 l
DILUTION WATER: 4C FgTrans
TEST TEMPERATURE: 20±2 °C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	20	20	20	20	19'	19	19
CONTROL B	20	20	20	20	19'	19	19
CONTROL C	20	20	20	20	20	20	19'
10% A	20	20	20	20	20	19'	19
B	20	20	18 (2)	18	18	18	18
C	20	20	20	20	19'	19	19
50% A	20	19'	0 (19)	—	—	—	—
B	20	20	1 (19)	1	0'	—	—
C	20	20	4 (16)	1 (5)	0'	—	—
100% A	20	TTTC	0 (20)	—	—	—	—
B	20	TTTC	0 (20)	—	—	—	—
C	20	TTTC (10)	0 (10)	—	—	—	—
NUO	✓	✓	✓	✓	✓	✓	✓
INITIALS	SG 3/3	SG 3/3	SG 3/4	SG 3/4	SG 3/5	SG 3/6	SG 3/7
QA/QC							

(NUO = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED BELOW)

NOTES:

OCEAN DISPOSAL BIOASSAY

JOB #: 92-91361
CLIENT: Exxon Bay Way
SITE ID: Area # 3
START DATE: 3/3/92
START TIME: 12:40 pm

SPECIES: M. menidia
TEST VOLUME: 19 L
DILUTION WATER: 40 Fathoms
TEST TEMPERATURE: 20 ± 2°C
PHASE: LIQUID _____ SUSPENDED PARTICULATE ✓

SAMPLE ID	DISSOLVED OXYGEN (mg/L)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	7.4	7.4	7.4	7.1	7.0	19.5	19.0	19.0	20.0	18.5	7.9	8.0	8.1	8.0	8.1	29.0	29.0	30.0	31.5	32.0
B	7.4	7.4	7.3	7.2	7.0	19.5	18.5	18.5	20.0	18.5	8.0	8.0	8.1	8.0	8.0	29.0	28.5	30.0	31.0	30.0
C	7.5	7.4	7.4	7.2	7.0	20.5	18.5	18.5	20.0	18.5	8.0	8.1	8.1	8.0	8.1	29.0	28.5	29.5	31.0	31.0
10% A	7.4	7.4	7.4	7.2	7.0	19.0	18.5	19.0	20.0	19.5	7.8	8.1	8.1	8.0	8.1	29.0	29.0	29.0	31.0	31.0
D	7.4	7.4	7.4	7.2	7.0	19.5	19.0	19.0	20.5	19.5	7.8	8.1	8.2	8.1	8.1	28.5	29.0	29.0	31.0	31.0
C	7.6	7.5	7.4	7.1	7.0	20.0	19.0	19.0	21.0	20.5	7.8	8.1	8.2	8.0	8.1	29.0	29.0	30.5	31.5	33.0
50% A	7.4	7.5	—	—	—	19.5	19.5	—	—	—	7.6	8.2	—	—	—	29.0	29.0	—	—	—
B	7.4	7.4	7.4	—	—	20.0	19.5	19.5	—	—	7.6	8.2	8.3	—	—	28.5	29.0	29.0	—	—
C	7.4	7.6	7.4	—	—	19.5	20.0	20.0	—	—	7.7	8.2	8.3	—	—	28.5	29.0	29.0	—	—
100% A	6.4	7.4	—	—	—	18.0	20.0	—	—	—	7.3	8.2	—	—	—	28.0	28.5	—	—	—
B	6.4	7.4	—	—	—	18.0	19.5				7.4	8.2	—	—	—	28.5	28.5	—	—	—
C	6.6	7.4	—	—	—	18.0	19.0				7.5	8.2	—	—	—	28.0	28.5	—	—	—
INITIALS	SG 3/3	SG 3/4	SG 3/5	SG 3/6	SG 3/7	SG 3/3	SG 3/4	SG 3/5	SG 3/6	SG 3/7	SG 3/3	SG 3/4	SG 3/5	SG 3/6	SG 3/7	SG 3/3	SG 3/4	SG 3/5	SG 3/6	SG 3/7
QA/QC																				

NOTES (COLOR, VISUAL DESCRIPTION):

00070

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 3/3/92 QA/QC: _____

TEST JOB #: 92-91361 CLIENT: EXXON BAYWAY

IN-LAB [ ] MOBILE [✓] SATELLITE [ ]

TEST SPECIES: M. MENIDIA

Total Number of organisms acclimated: 240

AQUA SURVEY, INC Investigators: EL JM

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: L6 TANK - 92-0152
2. Procured From/Date Received: 92-0037 MAIT. AQUA ~~2/28/92~~ 2/25/92 (JM)
3. Age Information: MIXED ADULTS

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 11.5°C
2. Salinity: 20 ppt
3. Alkalinity: —

C. HOLDING [✓] CULTURE [ ] WATER PARAMETERS

1. Temperature: 18.0°C
2. Salinity: 31.0ppt
3. Alkalinity: —
4. Water Source: Fort Fathom

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 19 l per bag
2. Acclimation Water Type: Fort Fathom
3. Acclimation Water Temperature: 20.0°C
4. Acclimation Water Salinity: 31.0ppt
5. Acclimation Commencement - Date: 2/26/92 Time: 11:00 AM
6. Change-Over Rate (ml/minute): 15-20 ml/min
7. Culture Acclimation Ending-Date: 2/29/92 Time: 10:30 AM
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 3/3/92 Time: 830 AM
2. Temperature: 18.0°C
3. Salinity: 31.0ppt
4. Alkalinity: —
5. Culture Lab Technician Initials: JM/DB [Transfer]
6. Test Lab Technician Initials: [Receiving]

REMARKS: S.P.P.

(JM) mistake

00071

M. meridia Area 3 24 hr LC50 = 22.3%

ONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
1[illegible]	60	60	100	8.673618E-17
[illegible]	60	58	96.66666	1.588139E-13
10	60	2	3.333334	1.588139E-13

HE BINOMIAL TEST SHOWS THAT 10 AND 50 CAN BE USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 100 PERCENT.
N APPROXIMATE LC50 FOR THIS SET OF DATA IS 22.36067

>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

PAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	.0233886	22.36067	19.74243	25.32613

>>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	5.356569E-02		1 .8894814

SLOPE = 5.264981
95 PERCENT CONFIDENCE LIMITS = 4.046439 AND 6.483522

LC50 = 22.32847
95 PERCENT CONFIDENCE LIMITS = 18.37003 AND 27.09245
LC1 = 8.070895
95 PERCENT CONFIDENCE LIMITS = 5.53525 AND 10.4694

'hr LC50 = 20.0 M. menidia Area 3

:ONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
100	60	60	100	8.673618E-17
⁵	60	60	100	8.673618E-17
1	60	3	5	3.126926E-12

HE BINOMIAL TEST SHOWS THAT 10 AND 50 CAN BE
.SED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
:ONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
'SSOCIATED WITH THESE LIMITS IS 100 PERCENT.
N APPROXIMATE LC50 FOR THIS SET OF DATA IS 19.9788

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT
EAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE
ROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

1. menidia Area 3 72+96 hrs LC50 = 19.5%

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
100	60	60	100	8.673618E-17
5	60	60	100	8.673618E-17
1	60	4	6.666667	4.542252E-11

HE BINOMIAL TEST SHOWS THAT 10 AND 50 CAN BE
SED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
SSOCIATED WITH THESE LIMITS IS 100 PERCENT.
N APPROXIMATE LC50 FOR THIS SET OF DATA IS 19.48849

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT
EAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE
ROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 4/1/92 QA/QC: _____

TEST JOB #: 91-361 CLIENT: Exxon Bayway

IN-LAB [ ] MOBILE [✓] SATELLITE [ ]

TEST SPECIES: Menidia Sp.

Total Number of organisms acclimated: 240+

AQUA SURVEY, INC Investigators: ERIC/DON

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: 92-0047
2. Procured From/Date Received: SP ENG, Salem, MA 3/27/92
3. Age Information: MIXED ADULTS

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 22°C
2. Salinity: 30ppt
3. Alkalinity: _____

C. HOLDING [✓] CULTURE [ ] WATER PARAMETERS

1. Temperature: 22°C
2. Salinity: 31ppt
3. Alkalinity: _____
4. Water Source: 40 FATHOMS

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 500L / QSW2 ②
2. Acclimation Water Type: 40 FATHOMS
3. Acclimation Water Temperature: 24.0°C
4. Acclimation Water Salinity: 31ppt
5. Acclimation Commencement - Date: 3/30/92 Time: 1300HRS
6. Change-Over Rate (ml/minute): 150-260 ml/min ①
7. Culture Acclimation Ending-Date: 3/31/92 Time: 1700HRS
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 4/1/92 Time: 0815HRS
2. Temperature: 22°C
3. Salinity: 31ppt
4. Alkalinity: _____
5. Culture Lab Technician Initials: DB [Transfer]
6. Test Lab Technician Initials: _____ [Receiving]

REMARKS: ① Electric Metering Pump
② Chiller Unit on QSW2

00075

SRT A. tonsa 2/7/92

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
5	20	20	100	9.536743E-05
[illegible]	20	17	85	.1288414
[illegible]5	20	2	10	2.012253E-02
.63	20	4	20	.5908966

THE BINOMIAL TEST SHOWS THAT 1.25 AND 2.5 CAN BE USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 99.85103 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1.821333

>>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	9.733045E-02	1.63084	1.252677	2.086565

>>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	3.566173	5.898759	2.742648E-03

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.70702
95 PERCENT CONFIDENCE LIMITS =-3.293433 AND 10.70747

LC50 = 1.53699
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
LC1 = .3622427
95 PERCENT CONFIDENCE LIMITS = 0 AND 1.253075

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR REFERENCE TOXICANT

SPECIES: A. tonsa
TOXICANT: SODIUM DODECYL SULFATE LOT #:
START DATE: 07 Jan 92
START TIME: 2:40 pm
END TIME: 2:40 pm

SOURCE:
TEST VOLUME: 1.0L
DILUTION WATER: Manasquan
TEST TEMPERATURE: 20 ± 2°C

CONCENTRATION (mg/l)	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	10	10	9'	9	9	9	9
CONTROL B	10	10	10	10	10	10	10
0.63 A	10	10	9'	8'	7'	7	7
B	10	10	10	9'	9	9	9
1.25 A	10	10	9	8'	8	8	8
B	10	10	10	10	10	10	10
2.50 A	10	10	2[3]	2	2	X[1]	1'
B	10	9'	2[3]	2	2	2	2
5.00 A	10	10	0[10]	—	—	—	—
B	10	9'	0[0]	—	—	—	—
NUO	✓	✓	✓	✓	✓	✓	✓
INITIALS	CV 01/07	CV 01/07	CV 01/07	CV 01/08	CV 01/08	CV 01/10	SAD 1/11
QA/QC	✓	✓			✓	✓	

(NUO = NOTHING UNUSUAL OBSERVED)
NOTES AND OBSERVATIONS:

① 1' 01/10/92 CV

SRT-LC.

AQUA SURVEY, INC

SALTWATER ORGANISMS

96 HOUR REFERENCE TOXICANT

SPECIES: A. Tonsa

TOXICANT: SODIUM DODECYL SULFATE LOT #:

START DATE: 07 Jan 92

START TIME: 2:45 PM

TEST VOLUME: 600ml 1.0L

DILUTION WATER: Marathon

TEST TEMPERATURE: 20 ± 2°C

SAMPLE ID	DISSOLVED OXYGEN (mg/l)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	7.2	6.3	6.4	5.5	7.4	20.5	22.0	20.5	20.5	18.0	8.1 ①	8.0	7.7	7.8	8.1	28.0	29.0	28.5	28.5	29.0
CONTROL B	7.2				7.4	20.5				18.0	8.1 ②				8.1	28.0				29.0
0.63 A	7.4	6.3	6.4	5.5	7.4	20.5	22.0	20.5	21.0	18.0	7.0	8.0	7.8	8.0	8.1	28.0	29.0	28.5	29.0	29.0
B	7.4				7.5	20.5				18.0	7.0				8.1	28.0				29.0
1.25 A	7.3	6.2	6.4	5.6	7.4	20.5	22.0	20.5	21.0	18.0	7.0	8.0	7.9	8.0	8.2	28.0	29.0	28.5	29.0	28.5
B	7.3				7.5	20.5				18.0	7.0				8.2	28.0				29.0
2.50 A	7.3	6.1	6.4	5.7	7.4	20.5	22.0	20.5	21.0	18.0	7.7	8.0	8.0	8.0	8.2	28.0	28.5	28.5	28.5	29.0
B	7.3				7.5	20.5				18.0	7.7				8.2	28.0				28.0
5.00 A	7.3	5.2	—	-	—	20.5	22.0	—	—	—	7.7	8.0	—	—	-	28.0	28.0	-	-	—
B	7.3				—	20.5					7.7		—	-	-	28.0				-
INITIALS	CL JB 1/7	JB CL 1/8	CL JB 1/9	JB 1/10	SD 1/11	CL JB 1/7	JB 1/8	SD CL 1/9	CL JB 1/9	JB 1/10	SD 1/11	CL JB 1/7	JB CL 1/9	CL JB 1/9	JB 1/10	SD JB 1/11	CL JB 1/7	JB CL 1/8	CL JB 1/9	JB 1/10	SD 1/11
QA/QC																				

① 7.6 ? JE 1/7

② 7.6 ?

00078

Aqua-Survey Stock and Treatments Preparation Sheet
**** ALL UNITS ARE IN PPM UNLESS OTHERWISE SPECIFIED ****

Job No. :QA/QC Species: A. tonsa

Date :10/10/91 Location:ASI Flemington,NJ

TOXICANT:SLS SOURCE/LOT No.: Aldrich, 70% / #04619LW

Enter ratio of stock solution to highest test concentration in 14A:
20.00 Enter Stock Solution Volume: 1000.00 ml.

Enter concentrations in PPM, highest to lowest, in column A below:
5.00
2.50
1.25
0.63
0.00
0.00

Enter total volume of each container in Milliliters in A-25:
200.00
Enter number of replicates per treatment in A-27:
2.00
Enter excess solution for each treatment in A-29:
200.00 . Total ml= 600.00

First, prepare STOCK SOLUTION by adding
0.1000 grams [Note:Stock conc.,mg./ml.= 0.10
of stock chemical to a 1000.00 ml. volumetric flask.
Mix, then pour to mixing chambers as follows:

Conc., PPM	ml. Stock Sol'n.	ml. Dilution Water	Total Vol
0.00	0.00	600.00	600.00
0.00	0.00	600.00	600.00
0.00	0.00	600.00	600.00
0.63	3.75	596.25	600.00
1.25	7.50	592.50	600.00
2.50	15.00	585.00	600.00
5.00	30.00	570.00	600.00
Totals:	56.25	4143.75	4200.00

by Chris Nally

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 1-7-92 QA/QC: _____

TEST JOB #: _____ CLIENT: SRT

IN-LAB [✓] MOBILE [ ] SATELLITE [ ]

TEST SPECIES: A. tonsa

Total Number of organisms acclimated: 100

AQUA SURVEY, INC Investigators: ERIC/JOE

A. **ORGANISMS**

1. ASI Culture/Holding [Tank/Receiving Log #]: 16l / 4l JARS
2. Procured From/Date Received: N/A
3. Age Information: MIXED ADULTS

B. **RECEIVING WATER PARAMETERS** (Non Cultured Organisms)

1. Temperature: _____
2. Salinity: _____
3. Alkalinity: _____

C. **HOLDING** [ ] **CULTURE** [✓] **WATER PARAMETERS**

1. Temperature: 20°C
2. Salinity: 15ppt
3. Alkalinity: _____
4. Water Source: FILTERED/CHLORINATED MANASQUAN : D.I. WELL WATER

D. **ACCLIMATION** [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 16l
2. Acclimation Water Type: MANASQUAN/FILTERED
3. Acclimation Water Temperature: 20°C
4. Acclimation Water Salinity: 30 ppt
5. Acclimation Commencement - Date: 1-3-92 Time: 1300HRS
6. Change-Over Rate (ml/minute): 10-15 ml/min.
7. Culture Acclimation Ending-Date: 1-7-92 Time: 1400HRS
8. _____ Acclimation Ending-Date: _____ Time: _____

E. **TRANSFER CUSTODY & TRANSFER WATER PARAMETERS**

1. Culture Lab > Test Lab: -Date: 1-7-92 Time: 1400HRS
2. Temperature: 20°C
3. Salinity: 30 ppt
4. Alkalinity: _____
5. Culture Lab Technician Initials: EL/JMcD [Transfer]
6. Test Lab Technician Initials: _____ [Receiving]

REMARKS: _____

00080

SRT M. bohin 2/11/92

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
	20	20	100	9.536743E-05
	20	10	50	58.80986
2.5	20	1	5	2.002716E-03
1.25	20	1	5	2.002716E-03

THE BINOMIAL TEST SHOWS THAT 2.5 AND 10 CAN BE
USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS 99.99791 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 5

>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.0657294	4.564774	3.740288	5.774934

>>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
7	3.208889	5.007452	6.687999E-03

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 4.55015
95 PERCENT CONFIDENCE LIMITS =-3.600703 AND 12.701

LC50 = 4.537153
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
LC1 = 1.397713
95 PERCENT CONFIDENCE LIMITS = 0 AND 3.791053

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR REFERENCE TOXICANT

SPECIES: M bahia
TOXICANT: SODIUM DODECYL SULFATE LOT #:
START DATE: 2/11/92
START TIME: 4:50

SOURCE:
TEST VOLUME: 1 liter
DILUTION WATER: manasquan
TEST TEMPERATURE: 20° ± 2°C

CONCENTRATION (mg/l)	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	10	10	10	9	9	9	9
CONTROL B	10	10	10	10	10	10	10
1.25 A	10	10	10	10	10	10	10
B	10	10	9	9	9	9	9
2.50 A	10	10	10	10	10	10	10
B	10	10	10	10	10	10	9
5.0 A	10	10	7 [3]	6 [1]	5 [1]	5	5
B	10	10	8 [2]	6 [1]	6	5	5
10.0 A	10	10	8 [2]	4 [1]	0 [4]	—	—
B	10	10	2 [8]	1	0 [1]	—	—
NUO	—	✓	✓	✓	✓	✓	✓
INITIALS	RW	CL 2/11/92	CL 2/12/92	JB 2/12	CL 2/13	JB 2/14	CL 2/15
QA/QC	2/11/92						

(NUO = NOTHING UNUSUAL OBSERVED)
NOTES AND OBSERVATIONS:

SRT-LC

AQUA SURVEY, INC

SALTWATER ORGANISMS

96 HOUR REFERENCE TOXICANT

SPECIES: M. bahia

TOXICANT: SODIUM DODECYL SULFATE LOT #:

START DATE: 2/11/92

START TIME: 4:50

TEST VOLUME: 1 Liter

DILUTION WATER: manasquan

TEST TEMPERATURE: 20 ± 2°C

SAMPLE ID	DISSOLVED OXYGEN (mg/l)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	7.5	6.5	6.6	6.7	7.2	19.5	20.5	20.0	20.0	20.5	7.8	8.1	8.2	8.1	8.1	31.0	29.0	28.0	29.5	30.0
CONTROL B	7.5				7.2	19.5				20.5	7.8				8.1	31.0				30.0
1.25 A	7.4	6.6	6.6	6.8	7.2	19.5	20.5	20.0	20.5	20.5	7.9	8.0	8.2	8.0	8.1	31.0	30.0	28.0	30.5	30.0
B	7.4				7.1	19.5				20.5	7.9				8.1	31.0				30.0
2.50 A	7.4	6.5	6.5	6.7	6.8	19.5	20.5	20.0	20.5	20.5	7.9	8.0	8.1	8.0	8.1	31.0	30.0	28.0	30.5	30.0
B	7.4				6.7	19.5				20.5	7.9				8.1	31.0				30.0
5.0 A	7.4	6.5	6.5	6.8	6.7	19.5	20.5	20.0	20.5	20.5	7.9	8.0	8.1	8.0	8.1	31.0	30.0	28.0	30.5	30.0
B	7.4				6.7	19.5				20.5	7.9				8.1	31.0				30.0
10.0 A	7.4	6.4	6.3	–	–	19.5	20.5	20.0	–	–	7.9	8.0	8.0	–	–	31.0	30.0	28.0	–	–
B	7.4		6.2	–	–	19.5		20.0	–	–	7.9		8.0	–	–	31.0		28.0	–	–
INITIALS	CL 2/11	SB/CL 2/12	CL/JB 2/13	[illegible]	[illegible]	CL 2/11	CL 2/11	SB/CL 2/12	JB/CL 2/13	[illegible]	[illegible]	CL 2/11	SB/CL 2/12	CL/JB 2/13	[illegible]	CL 2/11	CL 2/11	SB/CL 2/12	CL/JB 2/13	[illegible]
QA/QC																				

00083

Aqua-Survey Stock and Treatments Preparation Sheet
**** ALL UNITS ARE IN PPM UNLESS OTHERWISE SPECIFIED ****

Job No. :QA/QC Species: M. bahia

Date :02/11/92 Location:ASI Flemington,NJ

TOXICANT:SLS SOURCE/LOT No.: Aldrich, 70% / #04619LW

Enter ratio of stock solution to highest test concentration in 14A:
20.00 Enter Stock Solution Volume: 1000.00 ml.

Enter concentrations in PPM, highest to lowest, in column A below:
10.00
5.00
2.50
1.25
0.00
0.00

Enter total volume of each container in Milliliters in A-25:
1000.00
Enter number of replicates per treatment in A-27:
2.00
Enter excess solution for each treatment in A-29:
200.00 . Total ml= 2200.00

First, prepare STOCK SOLUTION by adding
0.2000 grams [Note:Stock conc.,mg./ml.= 0.20
of stock chemical to a 1000.00 ml. volumetric flask.
Mix, then pour to mixing chambers as follows:

Conc., PPM	ml. Stock Sol'n.	ml. Dilution Water	Total Vol
0.00	0.00	2200.00	2200.00
0.00	0.00	2200.00	2200.00
0.00	0.00	2200.00	2200.00
1.25	13.75	2186.25	2200.00
2.50	27.50	2172.50	2200.00
5.00	55.00	2145.00	2200.00
10.00	110.00	2090.00	2200.00
Totals:	206.25	15193.75	15400.00

BY: CHRIS NALLY

A Q U A S U R V E Y I N C.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 2-11-92 QA/QC: _____

TEST JOB #: 1010 CLIENT: In-house

IN-LAB [✓] MOBILE [ ] SATELLITE [ ]

TEST SPECIES: M. bahia

Total Number of organisms acclimated: 100

AQUA SURVEY, INC Investigators: [illegible]

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: 92-0098 test log#
2. Procured From/Date Received: Aqua Survey Inc.
3. Age Information: <5 days Hatch date 2-9-92

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: ✓
2. Salinity: ✓
3. Alkalinity: _____

C. HOLDING [ ] CULTURE [✓] WATER PARAMETERS

1. Temperature: 25.0°C
2. Salinity: 25.0ppt
3. Alkalinity: 30?
4. Water Source: 4C Filtered/UV well water

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 114 ℓ
2. Acclimation Water Type: Manuequan
3. Acclimation Water Temperature: 23.0°C
4. Acclimation Water Salinity: 30.0ppt
5. Acclimation Commencement - Date: 2-10-92 Time: 1200hrs
6. Change-Over Rate (ml/minute): 50-40 ml/minute
7. Culture Acclimation Ending-Date: 2-11-92 Time: 1200hrs
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 2-11-92 Time: 1510hrs
2. Temperature: 25.5°C
3. Salinity: 30.0ppt
4. Alkalinity: 30?
5. Culture Lab Technician Initials: CW26 [Transfer]
6. Test Lab Technician Initials: [illegible] [Receiving]

REMARKS: SRT

00085

SDS Menidia spp 1/29/92 96hr LC50 = 2.5 (1.25-5 Binomial

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
	20	20	100	9.536743E-05
	20	10	50	58.80986
1.25	20	0	0	9.536743E-05
.63	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 1.25 AND 5 CAN BE USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 99.99982 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 2.5

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

Area #1

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
5	20	20	100	9.536743E-05
	20	10	50	58.80986
1.25	20	0	0	9.536743E-05
.63	20	10	50	58.80986

THE BINOMIAL TEST SHOWS THAT 0 AND 5 CAN BE
USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS 99.99991 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 2.5

>>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.2065832	2.499996	1.759925	4.253644

>>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
7	17.60089	14.66638	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 1.839658
95 PERCENT CONFIDENCE LIMITS =-5.878338 AND 9.557653

LC50 = 1.706368
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
LC1 = 9.274234E-02
1 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY

AQUA SURVEY, INC
SALTWATER ORGANISMS
96 HOUR REFERENCE TOXICANT

SPECIES: M. menidia
TOXICANT: SODIUM DODECYL SULFATE LOT #:
START DATE: 29-Jan-92
START TIME: 12:10

SOURCE:
TEST VOLUME: 18L
DILUTION WATER: Marinequa
TEST TEMPERATURE: 20° ± 2°

CONCENTRATION (mg/l)	LIVE COUNTS						
	INITIAL	4	8	24	48	72	96
CONTROL A	10	10	10	10	10	10	10
CONTROL B	10	10	10	10	10	10	10
0.63 A	10	① 10	0	0	—	—	—
B	10	10	10	10	10	10	10
1.25 A	10	10	10	10	10	10	10
B	10	10	10	10	10	10	10
2.50 A	10	10	10	10	10	10	10
B	10	0 10	0	—	—	—	—
5.00 A	10	0 10	0	—	—	—	—
B	10	0 10	0	—	—	—	—
NUO	✓	✓	✓	✓	✓	✓	✓
INITIALS	LB 1/29	CL 1/29	CL 1/30	CL 1/30	CL 1/31	DH 2/1	DH 2/2
QA/QC							

(NUO = NOTHING UNUSUAL OBSERVED)
NOTES AND OBSERVATIONS:

① 1⁹ mistake CL 1/29

SRT-LC

00088

AQUA SURVEY, INC

SALTWATER ORGANISMS

96 HOUR REFERENCE TOXICANT

SPECIES: M. menidia

TOXICANT: SODIUM DODECYL SULFATE LOT #:

START DATE: 29 Jan 92

START TIME: 12:10

TEST VOLUME: 18 L

DILUTION WATER: Manasquan

TEST TEMPERATURE: 20 ± 2°C

SAMPLE ID	DISSOLVED OXYGEN (mg/l)					TEMPERATURE (DEGREES CELCIUS)					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	8.8	6.2	5.9	3.8	3.4	18.5	21.0	21.5	20.0	19.5	7.7	7.7	7.6	7.5	7.4	31.0	31.5	31.0	31.0	31.0
CONTROL B	8.6	6.2	5.9	3.9 7.2	3.7	18.5	21.0	21.5	20.0	19.5	7.7	7.7	7.6	7.6	7.4	31.0	31.5	31.0	31.0	31.0
0.63 A	8.8	6.2	5.5	3.3 6.2	3.1	18.5	21.0	21.5	20.0	19.5	7.8	7.8	7.7	7.8	7.7	31.0	31.5	31.0	31.0	31.0
B	8.8	6.4	5.5	3.8	3.6	19.0	21.0	21.5	20.5	20.0	7.8	7.8	7.7	7.6	7.6	31.0	31.5	31.0	31.0	31.0
1.25 A	8.8	6.3	5.6	3.1	3.3	19.0	21.0	21.5	20.0	20.0	7.8	7.7	7.7	7.5	7.5	31.0	31.5	31.0	31.0	31.0
B	8.8	6.0	5.5	3.6	3.6	18.5	21.0	21.5	20.0	20.0	7.8	7.7	7.6	7.5	7.5	31.0	31.5	31.0	31.0	31.0
2.50 A	8.8	6.0	5.1	3.8	3.7	19.0	21.0	21.5	20.5	20.0	7.7	7.8	7.6	7.6	7.6	31.0	31.5	31.0	31.0	31.0
B	8.8	7.0	—	—	—	19.0	21.0	① 21.5	—	—	7.6	7.8	—	—	—	31.0	31.5	—	—	—
5.0 A	8.8	7.3	—	—	—	18.0	21.0	—	—	—	7.7	7.9	—	—	—	31.0	31.5	—	—	—
B	8.8	7.0	—	—	—	18.0	21.5	—	—	—	7.8	7.9	—	—	—	31.0	31.5	—	—	—
INITIALS																				
QA/QC																				

① Dead 1:51

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 1/29/92 QA/QC: _____

TEST JOB #: — CLIENT: In House

IN-LAB [/] MOBILE [ ] SATELLITE [ ]

TEST SPECIES: M. MENIDIA

Total Number of organisms acclimated: 100

AQUA SURVEY, INC Investigators: JM

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: Q52 92-0061
2. Procured From/Date Received: 92-0012 Multi AQUA 1/20/92
3. Age Information: MIXED ADULTS

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 7.5° DO: Sat.
2. Salinity: 30.0 ppt
3. Alkalinity: —

C. HOLDING [/] CULTURE [ ] WATER PARAMETERS

1. Temperature: 22.0°
2. Salinity: 29 ppt
3. Alkalinity: —
4. Water Source: Forty Fathoms Sea Water

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 19l Plastic Bags
2. Acclimation Water Type: 40 FATHOMS
3. Acclimation Water Temperature: 21.5°
4. Acclimation Water Salinity: 28.5 ppt
5. Acclimation Commencement - Date: 1/28/92 Time: 0900 HRS
6. Change-Over Rate (ml/minute): 15-20 ml/Min
7. Culture Acclimation Ending-Date: 1/29/92 Time: 1400 HRS
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 1/29/92 Time: 1000 HRS
2. Temperature: 20.0°
3. Salinity: 29 ppt
4. Alkalinity: —
5. Culture Lab Technician Initials: JM [Transfer]
6. Test Lab Technician Initials: [Receiving]

REMARKS: SRT

00090

Aqua-Survey Stock and Treatments Preparation Sheet
**** ALL UNITS ARE IN PPM UNLESS OTHERWISE SPECIFIED ****

Job No. :QA/QC Species: M. menidia

Date :01/29/92 Location:ASI Flemington,NJ

TOXICANT:SLS SOURCE/LOT No.: Aldrich, 70% / #04619LW

Enter ratio of stock solution to highest test concentration in 14A:
75.00 Enter Stock Solution Volume: 1000.00 ml.

Enter concentrations in PPM, highest to lowest, in column A below:
5.00
2.50
1.25
0.63
0.00
0.00

Enter total volume of each container in Milliliters in A-25:
18000.00
Enter number of replicates per treatment in A-27:
2.00
Enter excess solution for each treatment in A-29:
0.00 . Total ml=36000.00

First, prepare STOCK SOLUTION by adding
0.3750 grams [Note:Stock conc.,mg./ml.= 0.38
of stock chemical to a 1000.00 ml. volumetric flask.
Mix, then pour to mixing chambers as follows:

Conc., PPM	ml. Stock Sol'n.	ml. Dilution Water	Total Vol
0.00	0.00	36000.00	36000.00
0.00	0.00	36000.00	36000.00
0.00	0.00	36000.00	36000.00
0.63	60.48	35939.52	36000.00
1.25	120.00	35880.00	36000.00
2.50	240.00	35760.00	36000.00
5.00	480.00	35520.00	36000.00
Totals:	900.48	*********	*********

By: Chris Nally

Menidia spp 96hr LC50 SDS = 1.77 (1.25-2.50) 4/3/92

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (%)
5	20	20	100	9.536743E-05
2.5	20	20	100	9.536743E-05
1.25	20	0	0	9.536743E-05
.63	20	0	0	9.536743E-05

THE BINOMIAL TEST SHOWS THAT 1.25 AND 2.5 CAN BE USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 99.99982 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1.767766

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

Area #2

96 HR. REFERENCE TOXICANT TEST

JOB # QA / QC CLIENT ACOE NW / Atlantic SLC TOXICANT SDS

START DATE 30 March 92 END DATE 4/3/92 SPECIES M. meridia TEST TEMP 20 ± 2°C

START TIME 11:25 am END TIME 11:25 TEST WATER: Manasquan TEST VOLUME 19L

SAMPLE ID	LIVE COUNTS							pH					SALINITY PPT.				
	00	04	08	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	10	10	10	10	10	10	10	8.0	7.9	7.9	7.9	7.9	27.5	28.0	28.0	28.0	28.0
CONTROL B	10	10	10	10	10	10	10	8.0	7.9	7.8	7.9	7.9	27.5	28.0	28.0	28.0	28.0
0.1.3 A	10	10	10	10	10	10	10	8.0	7.9	7.8	7.9	7.9	27.5	28.0	28.0	28.0	28.0
B	10	10	10	10	10	10	10	8.0	7.9	7.8	7.8	7.9	27.5	28.0	28.0	28.0	28.0
1.25 A	10	10	10	10	10	10	10	8.0	7.9	7.8	7.8	7.9	27.5	28.0	28.0	28.0	28.0
B	10	10	10	10	10	10	10	8.0	7.9	7.8	7.8	7.9	27.5	28.0	28.0	28.0	28.0
2.50 A	10	0 10	-	-	-	-	-	8.0	7.9	-	-	-	27.5	28.0	-	-	-
B	10	0 10	-	-	-	-	-	8.0	7.9	-	-	-	27.5	28.0	-	-	-
5.0 A	10	0 10	-	-	-	-	-	8.0	7.9	-	-	-	27.5	28.0	-	-	-
B	10	0 10	-	-	-	-	-	8.0	7.9	-	-	-	27.5	28.0	-	-	-
DATE	3/30	3/30	03/31	3/31	4/1	4/2	4/3	3/30	03/31	4/1	4/2	4/3	3/30	03/31	4/1	4/2	4/3
INITIALS	CL	CL	CV	CL	CL	CL	CL	CL	CV/CL	CL TR	CL TR	CL TR	CL	CV/CL	CL TR	TR CL	CL JB

SAMPLE ID	TEMPERATURE °C					DISSOLVED OXYGEN mg/L				
	00	24	48	72	96	00	24	48	72	96
CONTROL A	18.0	18.5	20.5	19.0	19.0	7.8	7.4	6.8	6.7	6.7
CONTROL B	18.0	18.5	20.5	18.5	19.0	7.8	7.4	6.7	6.7	6.2
0.1.3 A	18.0	18.5	20.5	18.5	19.0	7.8	7.5	6.7	6.2	6.2
B	18.0	18.5	20.5	18.5	19.0	7.8	7.4	6.6	6.2	6.2
1.25 A	18.0	18.5	20.5	18.5	19.0	7.8	7.3	6.6	6.2	6.2
B	18.0	18.5	20.5	18.5	19.0	7.8	7.2	6.6	6.3	6.3
2.50 A	18.0	18.5	-	-	-	7.8	7.3	-	-	-
B	18.0	18.5	-	-	-	7.8	7.5	-	-	-
5.0 A	18.0	18.5	-	-	-	7.7	7.5	-	-	-
B	18.0	18.5	-	-	-	7.7	7.5	-	-	-
DATE	3/30	03/31	4/1	4/2	4/3	3/30	03/31	4/1	4/2	4/3
INITIALS	CL	CV/CL	CL TR	TR CL	CL TR	CL	CV/CL	CL TR	TR CL	CL JB

NOTES & OBSERVATIONS

SWREF96

Aqua-Survey Stock and Treatments Preparation Sheet
**** ALL UNITS ARE IN PPM UNLESS OTHERWISE SPECIFIED ****

Job No. :QA/QC Species: M. menidia

Date :03/30/92 Location:ASI Flemington,NJ

TOXICANT:SLS SOURCE/LOT No.: Aldrich, 70% / #04619LW

Enter ratio of stock solution to highest test concentration in 14A:
75.00 Enter Stock Solution Volume: 1000.00 ml.

Enter concentrations in PPM, highest to lowest, in column A below:
5.00
2.50
1.25
0.63
0.00
0.00

Enter total volume of each container in Milliliters in A-25:
18000.00
Enter number of replicates per treatment in A-27:
2.00
Enter excess solution for each treatment in A-29:
0.00 . Total ml=36000.00

First, prepare STOCK SOLUTION by adding
0.3750 grams [Note:Stock conc.,mg./ml.= 0.38
of stock chemical to a 1000.00 ml. volumetric flask.
Mix, then pour to mixing chambers as follows:

Conc., PPM	ml. Stock Sol'n.	ml. Dilution Water	Total Vol
0.00	0.00	36000.00	36000.00
0.00	0.00	36000.00	36000.00
0.00	0.00	36000.00	36000.00
0.63	60.48	35939.52	36000.00
1.25	120.00	35880.00	36000.00
2.50	240.00	35760.00	36000.00
5.00	480.00	35520.00	36000.00
Totals:	900.48	*********	*********

By: Chris Nally

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 3-30-92 QA/QC: _____

TEST JOB #: 92-053 CLIENT: ATLANTIC SALT

IN-LAB [✓] MOBILE [ ] SATELLITE [ ]

TEST SPECIES: MENIDIA Sp

Total Number of organisms acclimated: 100

AQUA SURVEY, INC Investigators: JH EP DB

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: QSI 92-0209
2. Procured From/Date Received: 92-0047 S.I. ENGINEERING 3/27/92
3. Age Information: MIXED ADULTS

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 18°C
2. Salinity: 31ppt
3. Alkalinity: _____

C. HOLDING [✓] CULTURE [ ] WATER PARAMETERS

1. Temperature: 24.0°C
2. Salinity: 28.0ppt
3. Alkalinity: _____
4. Water Source: MANASQUAN

D. ACCLIMATION [Temperature - Water Type] (1)

1. Acclimation Chamber Volume (Liters): 20 l - shipping Bags
2. Acclimation Water Type: MANASQUAN
3. Acclimation Water Temperature: 23°C
4. Acclimation Water Salinity: 30ppt
5. Acclimation Commencement - Date: 3/28/92 Time: 0800HRS
6. Change-Over Rate (ml/minute): 100 ml/min
7. Culture Acclimation Ending-Date: 3/28/92 Time: 1500 HRS
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 3-30-92 Time: 1115
2. Temperature: 24.00C
3. Salinity: 28.0ppt
4. Alkalinity: _____
5. Culture Lab Technician Initials: DM [Transfer]
6. Test Lab Technician Initials: SRT [Receiving]

REMARKS: SRT

(1) FISH REQUIRED FOR QUICK ACCLIMATION - TEMP & SALINITY MATCHED BEFORE INTRODUCTION TO LARGE CIRCULAR TANK (500l

00095

GDS. M. meridia 3/2/92. SRT. 96hr

5	20	20	100	9.536743E-05
2.5	20	20	100	9.536743E-05
1.25	20	2	10	2.012253E-02
.63	20	2	10	2.012253E-02

THE BINOMIAL TEST SHOWS THAT 1.25 AND 2.5 CAN BE
USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS 99.97978 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1.639814

>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	7.559081E-02		1.415677	1.103995
1.750591				

>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
7	5.246558	7.313695	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 5.639067
95 PERCENT CONFIDENCE LIMITS =-7.277424 AND 18.55556

LC50 = 1.472872
95 PERCENT CONFIDENCE LIMITS = 0 AND + INFINITY
LC1 = .5695676
95 PERCENT CONFIDENCE LIMITS = 0 AND 1.63894

Urea #3

AQUA-SURVEY, INC.
96 HOUR REFERENCE TOXICANT TEST

JOB #: QA/QC TOXICANT: SDS SPECIES: M. mexidia SOURCE: _____

START DATE: 22 March 92 END DATE: 26 March 92 TEST TEMPERATURE: 20±2°C

START TIME: 12:30 pm END TIME: 12:35 pm TEST WATER: Mono Lake TEST VOLUME: 19L

SAMPLE ID	LIVE COUNTS					DISSOLVED OXYGEN (mg/L)					TEMPERATURE (°CELSIUS)					pH				
	00 *	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	10	10	10	10	9'	7.9	5.7	5.9	3.9	7.5	18.0	20.5	20.5	20.5	19.5	7.8	7.6	7.5	7.3	7.9
CONTROL B	10	10	10	9'	9	7.9	5.7	5.8	3.7	7.5	18.0	20.5	20.5	20.5	19.5	7.8	7.7	7.5	7.4	7.9
0.63A	10	10	10	9'	9	8.0	5.8	5.4	3.2	7.3	18.0	21.0	20.5	20.5	19.5	7.8	7.7	7.5	7.3	7.9
B	10	10	10	10	9'	8.1	5.7	5.4	3.4	7.4	18.0	21.0	20.5	21.0	19.5	7.9	7.7	7.5	7.3	7.9
1.25A	10	10	10	9'	9	7.8	4.5	5.4	2.4	7.3	18.0	21.0	20.5	21.0	19.0	7.9	7.6	7.5	7.3	7.9
B	10	(1) 9	9	9	9	7.7	4.7	5.4	3.1	7.4	18.0	21.0	20.5	21.0	19.0	7.9	7.6	7.5	7.3	8.0
2.50A	10	0	-	-	-	7.7	6.3	-	-	-	18.0	21.0	-	-	-	7.9	7.9	-	-	-
B	10	0	-	-	-	7.7	6.5	-	-	-	18.0	21.0	-	-	-	7.9	7.9	-	-	-
5.0A	10	0	-	-	-	7.8	6.9	-	-	-	18.0	21.0	-	-	-	7.9	7.9	-	-	-
B	10	0	-	-	-	7.8	6.8	-	-	-	18.0	21.0	-	-	-	7.9	7.9	-	-	-
NUO	✓	✓	✓	✓					(2)											
DATE	3/2	3/3	3/4	3/5	03/06	3/2	3/3	3/4	3/5	03/06	3/2	3/3	3/4	3/5	03-06	3/2	3/3	3/4	03/05	03/06
INITIALS	CL JB	CL	CL	CL	CL	CL JB	JB	CL JB	SB CL	CL	CL JB	JB	CL JB	SB CL	CL	CL JB	JB	CL JB	CL	CL

NUO = NOTHING UNUSUAL OBSERVED

SAMPLE ID	~~CONDUCTIVITY (µmhos)~~ SALINITY (ppt)					OTHER _____				
	00	24	48	72	96	00	24	48	72	96
CONTROL A	29.0	29.5	29.0	29.0	29.5					
CONTROL B	29.0	29.5	29.0	29.0	29.5					
0.63A	29.0	29.5	29.0	29.0	29.5					
B	29.0	30.0	29.0	29.5	30.0					
1.25A	29.0	30.0	29.0	29.5	30.0					
B	29.0	30.0	29.0	29.5	30.0					
2.50A	29.0	30.0	-	-	-					
B	29.0	30.0	-	-	-					
5.0A	29.0	30.0	-	-	-					
B	29.0	30.5	-	-	-					
DATE	3/2	3/3	3/4	3/5	03/06					
INITIALS	CL JB	JB	CL JB	SB CL	CL					

(1) test aerated

NOTES AND OBSERVATIONS: _____

* Live counts

con A	10	10
B	10	10
0.63A	10	10
B	10	10
1.25A	10	10
B	10	9'
2.50A	0 10	-
B	2 8	0 2
5.0A	0 10	-
B	0 10	-
	4hr	8hr
initials	OB	CL
	3/2	3/3

SRT-96

00097

Aqua-Survey Stock and Treatments Preparation Sheet
**** ALL UNITS ARE IN PPM UNLESS OTHERWISE SPECIFIED ****

Job No. :QA/QC Species: M. menidia

Date :03/02/92 Location:ASI Flemington,NJ

TOXICANT:SLS SOURCE/LOT No.: Aldrich, 70% / #04619LW

Enter ratio of stock solution to highest test concentration in 14A:
75.00 Enter Stock Solution Volume: 1000.00 ml.

Enter concentrations in PPM, highest to lowest, in column A below:
5.00
2.50
1.25
0.63
0.00
0.00

Enter total volume of each container in Milliliters in A-25:
18000.00
Enter number of replicates per treatment in A-27:
2.00
Enter excess solution for each treatment in A-29:
0.00 . Total ml=36000.00

First, prepare STOCK SOLUTION by adding
0.3750 grams [Note:Stock conc.,mg./ml.= 0.38
of stock chemical to a 1000.00 ml. volumetric flask.
Mix, then pour to mixing chambers as follows:

Conc., PPM	ml. Stock Sol'n.	ml. Dilution Water	Total Vol
0.00	0.00	36000.00	36000.00
0.00	0.00	36000.00	36000.00
0.00	0.00	36000.00	36000.00
0.63	60.48	35939.52	36000.00
1.25	120.00	35880.00	36000.00
2.50	240.00	35760.00	36000.00
5.00	480.00	35520.00	36000.00
Totals:	900.48	*********	*********

By: Chris Nally

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 3-2-92 QA/QC: _____

TEST JOB #: _____ CLIENT: In house

IN-LAB [✓] MOBILE [ ] SATELLITE [ ]

TEST SPECIES: M. mercenaria

Total Number of organisms acclimated: 100

AQUA SURVEY, INC Investigators: [illegible]

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: 92-0037/0252 / Test Log #92-0
2. Procured From/Date Received: Mult. Aquaculture Systems Inc. 2-27-92
3. Age Information: mixed adult

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 11.5°C
2. Salinity: 10.0ppt
3. Alkalinity: n/a

C. HOLDING [✓] CULTURE [ ] WATER PARAMETERS

1. Temperature: 23.5°C
2. Salinity: 23.0ppt
3. Alkalinity: n/a
4. Water Source: Marinure

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 19
2. Acclimation Water Type: Marinure
3. Acclimation Water Temperature: 23.0°C
4. Acclimation Water Salinity: 23.0ppt
5. Acclimation Commencement - Date: 2-29-92 Time: 1000hrs
6. Change-Over Rate (ml/minute): 15-20 ml/minute
7. Culture Acclimation Ending-Date: 3-1-92 Time: 1000hrs
8. _____ Acclimation Ending-Date: _____ Time: _____

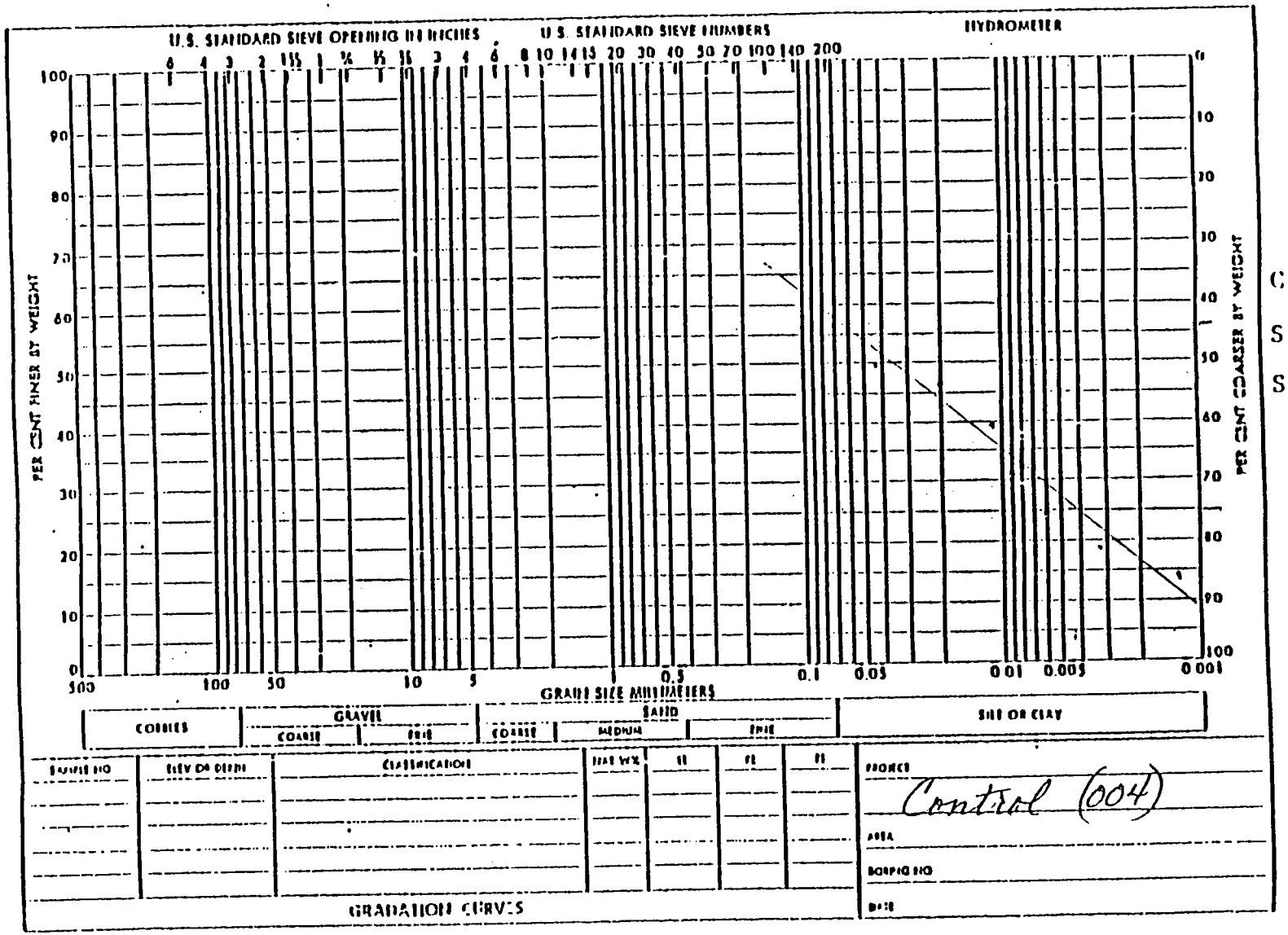
E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 3-2-92 Time: 1205 hrs
2. Temperature: 23.0°C
3. Salinity: 23.0ppt
4. Alkalinity: n/a
5. Culture Lab Technician Initials: [illegible] [Transfer]
6. Test Lab Technician Initials: [illegible] [Receiving]

REMARKS: SRT

00099

Sand ≥ 0.0625 0.0039 < Silt < 0.0625 Clay ≥ 0.0039



Clay- 25%
Silt- 31%
Sand- 44%

00100

Report Date: 03/05/92

te: 03/03/92
:al # of Samples: 1
Site: Control #004

Dispersant Correction: 3.0
Number of Entries: 7

Temperature: 21.000
Specific Gravity: 2.650

K Constant: 0.01348

Samples #: 1 Grams Used: 50.00

Hydroscopic Moisture Factor $\left|\frac{f}{m}\right|$: 0.97000

Clock Time	Elapse Time (T)	Hydrometer Reading $\left\|\frac{R}{h}\right\|$	Effective Depth (L)	Percent Suspend (%)	Grain Size (mm) (GS mm.)
09:02am	2.0	27.00	11.90	49.484536	0.0328813
09:05am	5.0	26.00	12.00	47.422680	0.0208831
09:15am	15.0	22.00	12.70	39.175258	0.0124036
09:30am	30.0	18.00	13.30	30.927835	0.0089754
10:00am	60.0	15.00	13.80	24.742268	0.0064648
01:10pm	250.0	12.00	14.30	18.556701	0.0032239
09:00am	1440.0	10.00	14.70	14.432990	0.0013620

Master

Client: Control Job #: _____

Sample #	Pan Weight	Pan Weight & Wet Sed.	Pan Weight & Air Dry	Percent Moisture	Pan Weight & Oven Dry	Hygroscopic Moisture	HMCF **	Grams used for sed.
#001 5-30-91	1.088	34.534	16.459	54.04	16.071		0.98	
#002 9-28-91	1.153	30.595	10.232	68.17	10.339		0.98	
#003 11-20-91	1.520	54.757	22.577	60.45	22.001		0.97	
#004 3-3-92	1.542	47.588	22.296	54.93	21.657		0.97	

** Percent Moisture = $\frac{\text{(Wet sample \& dish) - (Dry sample \& dish)}}{\text{(Wet sample \& dish) - dish}} \times 100$

Hygroscopic Moisture Correction Factor = oven dried / air dried

Date: _____ Site: _____

Dispersant Correction: 7

Sample # #001 Grams used: 50 f _____ M

5-30-91 Dis. Cyl

Clock Time	T	R h	L	Z	GS mm.
9:02	2	26			
9:05	5	24			
9:15	15	22			
9:30	30	20			
10:00	60	17			
1:16	250	14			
9:00	1440				

Sample # 004 Grams used: 50 f _____ M

3-3-92 Dis Cyl 3

Clock Time	T	R h	L	Z	GS mm.
9:02	2	27			
9:05	5	26			
9:15	15	22			
9:30	30	18			
10:00	60	15			
1:10	250	12			
9:00	1440	10			

Sample # 002 Grams used: 50 f _____ M

9-24-91 Dis Cyl 2

Clock Time	T	R h	L	Z	GS mm.
9:02	2	31			
9:05	5	33			
9:15	15	29			
9:30	30	24			
10:00	60	19			
1:16	250	15			
9:00	1440	8			

Sample # _____ Grams used: _____ f _____ M

Clock Time	T	R h	L	Z	GS mm.
	2				
	5				
	15				
	30				
	60				
	250				
	1440				

Sample # #003 Grams used: 50 f _____ M

11-5-91 Dis Cyl 4

Clock Time	T	R h	L	Z	GS mm.
9:02	2	34			
9:05	5	29			
9:15	15	25			
9:30	30	22			
10:00	60	18			
1:16	250	13			
9:00	1440	10			

T - Time in minutes after initial mixing

f - Hygroscopic Moisture Factor M

R - Hygrometer Reading h

L - Effective Depth, derived from table #2

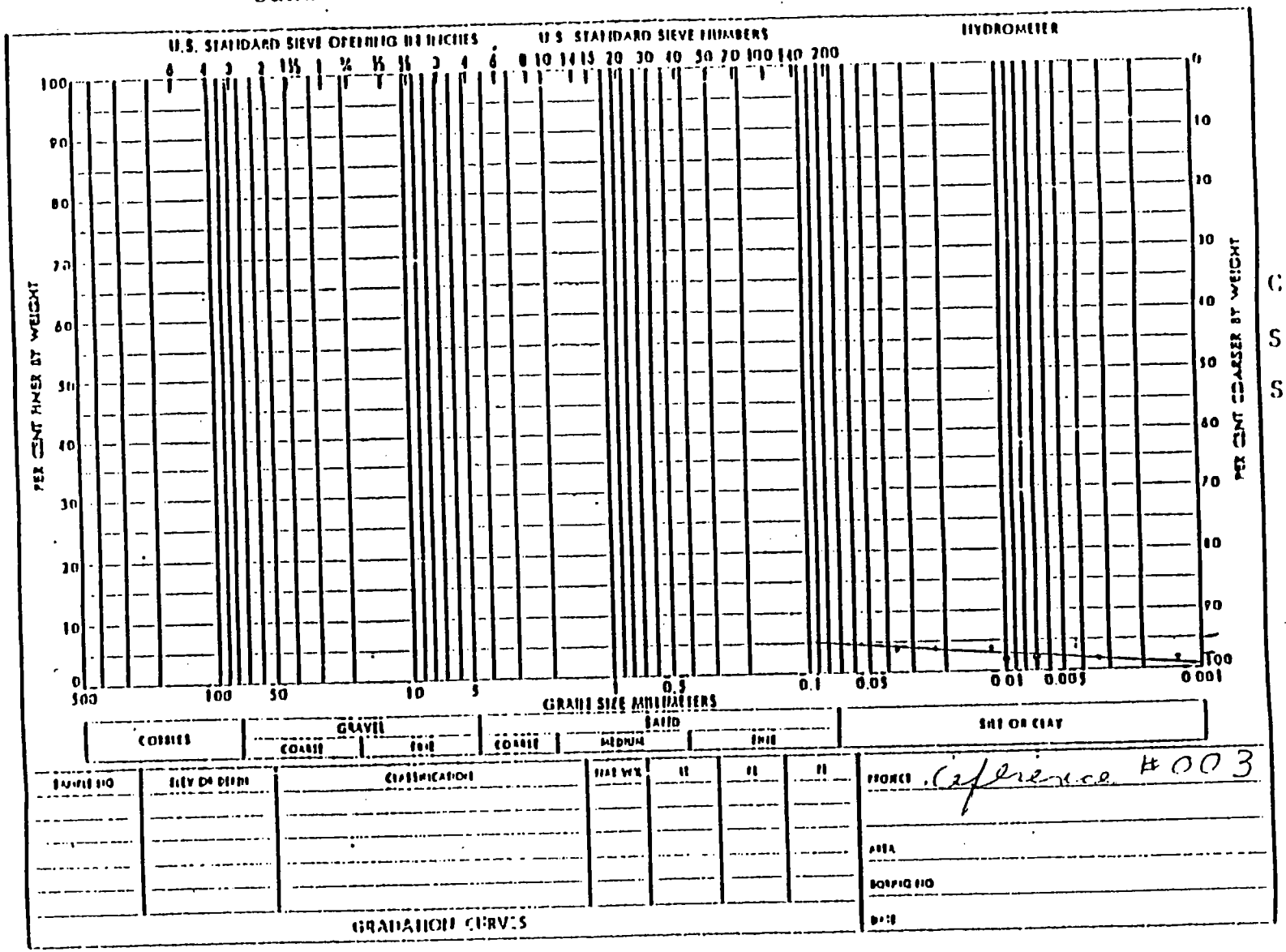
Z - % suspended (prog. #1): input f M, then each R h

GS - Grain Size (prog. #2): input T and L

Master Cyl 1

J 13 Micro Cylinder 9/25/91 DJC

Sand ≥ 0.0625 0.0039 < Silt < 0.0625 Clay ≥ 0.0039



Clay- 2%

Silt- 3%

Sand- 95%

Report Date: 03/05/92

Page: 1

r e: 03/03/92
al # of Samples: 1
Sice: Reference #003

Dispersant Correction: 3.000
Number of Entries: 7

Temperature: 21.000
Specific Gravity: 2.650

K Constant: 0.01348

Samples #: 1

Grams Used: 50.00

Hydroscopic Moisture Factor $|f_m|$: 1.00000

Clock Time	Elapse Time (T)	Hydrometer Reading $\|R_h\|$	Effective Depth (L)	Percent Suspend (%)	Grain Size (mm) (GS mm.)
09:06am	2.0	5.00	15.50	4.000000	0.0375267
09:09am	5.0	5.00	15.50	4.000000	0.0237340
09:19am	15.0	5.00	15.50	4.000000	0.0137028
09:34am	30.0	4.00	15.60	2.000000	0.0097206
10:04am	60.0	4.00	15.60	2.000000	0.0068735
01:14pm	250.0	4.00	15.60	2.000000	0.0033673
09:04am	1440.0	4.00	15.60	2.000000	0.0014030

FIGURE

Client: Reference Job #: _____

Sample #	Pan Weight	Pan Weight & Wet Sed.	Pan Weight & Air Dry	Percent Moisture	Pan Weight & Oven Dry	Hygroscopic Moisture	HMCF ¤	Grams used for sed.
#001 5-5-91	1.099	35.172	28.732	18.90	28.646		1.00	
#002 11/26/91	1.5352	67.6054	55.324	18.59	55.156		1.00	
#003 3-3-92	1.549	61.891	51.098	17.89	50.916		1.00	

¤ Percent Moisture = $\frac{\text{(Wet sample \& dish) - (Dry sample \& dish)}}{\text{(Wet sample \& dish) - dish}} \times 100$

Hygroscopic Moisture Correction Factor = oven dried / air dried

Date: ____ Site: ____

Dispersant: corrections: 4

Sample # 001 Grams used: 50 f_M ____

5-8-91 Dis. cor

Clock Time	T	R h	L	Z	GS mm.
9:06	2	6			
9:09	5	5			
9:19	15	5			
9:34	30	5			
10:04	60	5			
1:20	250	5			
9:04	1440	5			

Sample # ____ Grams used: ____ f_M ____

Clock Time	T	R h	L	Z	GS mm.
	2				
	5				
	15				
	30				
	60				
	250				
	1440				

Sample # 002 Grams used: 50 f_M 1.60

1-3-92 Dis Cor 4

Clock Time	T	R h	L	Z	GS mm.
9:06	2	7			
9:09	5	6			
9:19	15	5			
9:34	30	5			
10:04	60	4			
1:20	250	4			
9:04	1440	5			

Sample # ____ Grams used: ____ f_M ____

Clock Time	T	R h	L	Z	GS mm.
	2				
	5				
	15				
	30				
	60				
	250				
	1440				

Sample # 003 Grams used: 50 f_M ____

3-3-92 Dis Cor 3

Clock Time	T	R h	L	Z	GS mm.
9:06	2	5			
9:09	5	5			
9:19	15	5			
9:34	30	4			
10:04	60	4			
1:14	250	4			
9:04	1440	4			

T - Time in minutes after initial mixing

f_M - Hygroscopic Moisture Factor

R_h - Hydrometer Reading

L - Effective Depth, derived from table #2

Z - % suspended (prog. #1): input f_M, then each R_h

GS - Grain Size (prog. #2): input T and L

AQUA SURVEY INC.

TEST ORGANISM ACCLIMATION & TRANSPORTATION

DATE: 1/29/92 QA/QC: _____

TEST JOB #: — CLIENT: In House

IN-LAB [/] MOBILE [ ] SATELLITE [ ]

TEST SPECIES: M. MENIDIA

Total Number of organisms acclimated: 100

AQUA SURVEY, INC Investigators: JM

A. ORGANISMS

1. ASI Culture/Holding [Tank/Receiving Log #]: Q52 92-0061
2. Procured From/Date Received: 92-0012 Mutt AQUA 1/30/92
3. Age Information: MIXED ADULTS

B. RECEIVING WATER PARAMETERS (Non Cultured Organisms)

1. Temperature: 7.5° DO: Sat.
2. Salinity: 30.0ppt
3. Alkalinity: —

C. HOLDING [/] CULTURE [ ] WATER PARAMETERS

1. Temperature: 22.0°
2. Salinity: 29 ppt
3. Alkalinity: —
4. Water Source: Forty Fathoms Sea Water

D. ACCLIMATION [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): 19l Plastic Bags
2. Acclimation Water Type: 40 Fathoms
3. Acclimation Water Temperature: 21.5°
4. Acclimation Water Salinity: 28.5ppt
5. Acclimation Commencement - Date: 1/28/92 Time: 0900 HRS
6. Change-Over Rate (ml/minute): 15-20 ml/min
7. Culture Acclimation Ending-Date: 1/29/92 Time: 1400 HRS
8. _____ Acclimation Ending-Date: _____ Time: _____

E. TRANSFER CUSTODY & TRANSFER WATER PARAMETERS

1. Culture Lab > Test Lab: -Date: 1/29/92 Time: 1000 HRS
2. Temperature: 20.0°
3. Salinity: 29 ppt
4. Alkalinity: —
5. Culture Lab Technician Initials: JM [Transfer]
6. Test Lab Technician Initials: [Receiving]

REMARKS: SRT

00108

Aqua-Survey Stock and Treatments Preparation Sheet
**** ALL UNITS ARE IN PPM UNLESS OTHERWISE SPECIFIED ****

Job No. :QA/QC Species: M. menidia

Date :01/29/92 Location:ASI Flemington,NJ

TOXICANT:SLS SOURCE/LOT No.: Aldrich, 70% / #04619LW

Enter ratio of stock solution to highest test concentration in 14A:
75.00 Enter Stock Solution Volume: 1000.00 ml.

Enter concentrations in PPM, highest to lowest, in column A below:
5.00
2.50
1.25
0.63
0.00
0.00

Enter total volume of each container in Milliliters in A-25:
18000.00
Enter number of replicates per treatment in A-27:
2.00
Enter excess solution for each treatment in A-29:
0.00 . Total ml=36000.00

First, prepare STOCK SOLUTION by adding
0.3750 grams [Note:Stock conc.,mg./ml.= 0.38
of stock chemical to a 1000.00 ml. volumetric flask.
Mix, then pour to mixing chambers as follows:

Conc., PPM	ml. Stock Sol'n.	ml. Dilution Water	Total Vol
0.00	0.00	36000.00	36000.00
0.00	0.00	36000.00	36000.00
0.00	0.00	36000.00	36000.00
0.63	60.48	35939.52	36000.00
1.25	120.00	35880.00	36000.00
2.50	240.00	35760.00	36000.00
5.00	480.00	35520.00	36000.00
Totals:	900.48	*********	*********

By: Chris Nally

00109

Menidia spp 96hr LC50 SDS = 1.77 (1.25-2.50) 4/3/92

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
5	20	20	100	9.536743E-05
2.5	20	20	100	9.536743E-05
1.25	20	0	0	9.536743E-05
.63	20	0	0	9.536743E-05

THE BINOMIAL TEST SHOWS THAT 1.25 AND 2.5 CAN BE USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 99.99982 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1.767766

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

Area #2

96 HR. REFERENCE TOXICANT TEST

JOB # QA / QC CLIENT ACOE XIV / Atlantic Gulf TOXICANT SDS

START DATE 30 March 92 END DATE 4/3/92 SPECIES M. meridia TEST TEMP 20 ± 2°C

START TIME 11:25 am END TIME 11:25 TEST WATER: Mississippi TEST VOLUME 19L

SAMPLE ID	LIVE COUNTS							pH					SALINITY PPT.				
	00	04	08	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	10	10	10	10	10	10	10	8.0	7.9	7.9	7.7	7.9	27.5	28.0	28.0	28.0	28.0
CONTROL B	10	10	10	10	10	10	10	8.0	7.9	7.8	7.9	7.9	27.5	28.0	28.0	28.0	28.0
0.13 A	10	10	10	10	10	10	10	8.0	7.9	7.8	7.9	7.9	27.5	28.0	28.0	28.0	28.0
B	10	10	10	10	10	10	10	8.0	7.9	7.8	7.8	7.9	27.5	28.0	28.0	28.0	28.0
1.25 A	10	10	10	10	10	10	10	8.0	7.9	7.8	7.8	7.9	27.5	28.0	28.0	28.0	28.0
B	10	10	10	10	10	10	10	8.0	7.9	7.8	7.8	7.9	27.5	28.0	28.0	28.0	28.0
2.50 A	10	0 10	-	-	-	-	-	8.0	7.9	-	-	-	27.5	28.0	-	-	-
B	10	0 10	-	-	-	-	-	8.0	7.9	-	-	-	27.5	28.0	-	-	-
5.0 A	10	0 10	-	-	-	-	-	8.0	7.9	-	-	-	27.5	28.0	-	-	-
B	10	0 10	-	-	-	-	-	8.0	7.9	-	-	-	27.5	28.0	-	-	-
DATE	3/30	3/30	03/31	3/31	4/1	4/2	4/3	3/30	03/31	4/1	4/2	4/3	3/30	03/31	4/1	4/2	4/3
INITIALS	CL	CL	CL	CL	CL	CL	CL	CL	CL/VK	CL TR	AS IL	CL TR	CL	CL/VK	CL TR	TR IL	CL JB

SAMPLE ID	TEMPERATURE °C					DISSOLVED OXYGEN mg/L				
	00	24	48	72	96	00	24	48	72	96
CONTROL A	18.0	18.5	20.5	19.0	19.0	7.8	7.4	6.8	6.2	6.2
CONTROL B	18.0	18.5	20.5	18.5	19.0	7.8	7.4	6.7	6.2	6.2
0.13 A	18.0	18.5	20.5	18.5	19.0	7.8	7.5	6.7	6.2	6.2
B	18.0	18.5	20.5	18.5	19.0	7.8	7.4	6.6	6.2	6.2
1.25 A	18.0	18.5	20.5	18.5	19.0	7.8	7.3	6.6	6.2	6.2
B	18.0	18.5	20.5	18.5	19.0	7.8	7.2	6.6	6.3	6.3
2.50 A	18.0	18.5	-	-	-	7.8	7.3	-	-	-
B	18.0	18.5	-	-	-	7.8	7.5	-	-	-
5.0 A	18.0	18.5	-	-	-	7.7	7.5	-	-	-
B	18.0	18.5	-	-	-	7.7	7.5	-	-	-
DATE	3/30	03/31	4/1	4/2	4/3	3/30	03/31	4/1	4/2	4/3
INITIALS	CL	CL/VK	CL TR	TR IL	CL TR	CL	CL/VK	CL TR	TR IL	CL JB

NOTES & OBSERVATIONS

SWREF96

Date: ___ Site: ___

Dispersant correction: 4

Sample # 001 Grams used: 50 f M ___

5-8-91 Dis. Cor

Clock Time	T	R h	L	%	GS mm.
9:06	2	6			
9:09	5	5			
9:19	15	5			
9:34	30	5			
10:04	60	5			
1:20	250	5			
9:04	1440	5			

Sample # ___ Grams used: ___ f M ___

Clock Time	T	R h	L	%	GS mm.
	2				
	5				
	15				
	30				
	60				
	250				
	1440				

Sample # 002 Grams used: 50 f M 1.60

1-3-92 D. Cor 4

Clock Time	T	R h	L	%	GS mm.
9:06	2	7			
9:09	5	6			
9:19	15	5			
9:34	30	5			
10:04	60	4			
1:20	250	4			
9:04	1440	5			

Sample # ___ Grams used: ___ f M ___

Clock Time	T	R h	L	%	GS mm.
	2				
	5				
	15				
	30				
	60				
	250				
	1440				

Sample # 003 Grams used: 50 f M ___

3-3-92 Dis Cor 3

Clock Time	T	R h	L	%	GS mm.
9:06	2	5			
9:09	5	5			
9:19	15	5			
9:34	30	4			
10:04	60	4			
1:14	250	4			
9:04	1440	4			

T - Time in minutes after initial mixing

f - Hygroscopic Moisture Factor
M

R - Hygrometer Reading
h

L - Effective Depth, derived from table #2

% - % suspended (prog. #1): input f M, then each R h

GS - Grain Size (prog. #2): input T and L

master reverse

10 DAY BIOACCUMULATION

NYTEST ENVIRONMENTAL Inc.

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
1144901	PT-W1	Miscell.
1144902	PT-W2	Miscell.
1144903	PT-W3	Miscell.
1144904	PT-C1	Miscell.
1144905	PT-C2	Miscell.
1144906	PT-C3	Miscell.
1144907	PT-S1	Miscell.
1144908	PT-S2	Miscell.
1144909	PT-S3	Miscell.
1144910	S-REF1	Miscell.
1144911	S-REF2	Miscell.
1144912	S-REF3	Miscell.
1144913	S-REF3A	Miscell.
1144914	S-REF3B	Miscell.
1144915	S-REF4	Miscell.
1144916	S-REF5	Miscell.
1144917	W-REF1	Miscell.
1144918	W-REF2	Miscell.
1144919	W-REF3	Miscell.
1144920	W-REF3A	Miscell.
1144921	W-REF3B	Miscell.
1144922	W-REF4	Miscell.
1144923	W-REF5	Miscell.
1144924	C-REF1	Miscell.
1144925	C-REF2	Miscell.
1144926	C-REF3	Miscell.
1144927	C-REF3A	Miscell.
1144928	C-REF3B	Miscell.
1144929	C-REF4	Miscell.
1144930	C-REF5	Miscell.
1144931	A1-S1	Miscell.
1144932	A1-S2	Miscell.
1144933	A1-S3A	Miscell.
1144934	A1-S3B	Miscell.
1144935	A1-S3C	Miscell.
1144936	A1-S4	Miscell.
1144937	A1-S5	Miscell.
1144938	A1-S3AR	Miscell.
1144939	A1-S3BR	Miscell.
1144940	A1-S3CR	Miscell.
1144941	A1-W1	Miscell.
1144942	A1-W2	Miscell.
1144943	A1-W3A	Miscell.
1144944	A1-W3B	Miscell.
1144945	A1-W3C	Miscell.
1144946	A1-W4	Miscell.
1144947	A1-W5	Miscell.
1144948	A1-W3AR	Miscell.
1144949	A1-W3BR	Miscell.

NYTEST ENVIRONMENTAL Inc.

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
1144950	A1-W3CR	Miscell.
1144951	A1-C1	Miscell.
1144952	A1-C2	Miscell.
1144953	A1-C3A	Miscell.
1144954	A1-C3B	Miscell.
1144955	A1-C3C	Miscell.
1144956	A1-C4	Miscell.
1144957	A1-C5	Miscell.
1144958	A1-C3AR	Miscell.
1144959	A1-C3BR	Miscell.
1144960	A1-C3CR	Miscell.
1144961	A2-S1	Miscell.
1144962	A2-S2	Miscell.
1144963	A2-S3A	Miscell.
1144964	A2-S3B	Miscell.
1144965	A2-S3C	Miscell.
1144966	A2-S4	Miscell.
1144967	A2-S5	Miscell.
1144968	A2-S3AR	Miscell.
1144969	A2-S3BR	Miscell.
1144970	A2-S3CR	Miscell.
1144971	A2-W1	Miscell.
1144972	A2-W2	Miscell.
1144973	A2-W3A	Miscell.
1144974	A2-W3B	Miscell.
1144975	A2-W3C	Miscell.
1144976	A2-W4	Miscell.
1144977	A2-W5	Miscell.
1144978	A2-W3AR	Miscell.
1144979	A2-W3BR	Miscell.
1144980	A2-W3CR	Miscell.
1144981	A2-C1	Miscell.
1144982	A2-C2	Miscell.
1144983	A2-C3A	Miscell.
1144984	A2-C3B	Miscell.
1144985	A2-C3C	Miscell.
1144986	A2-C4	Miscell.
1144987	A2-C5	Miscell.
1144988	A2-C3AR	Miscell.
1144989	A2-C3BR	Miscell.
1144990	A2-C3CR	Miscell.

NYTEST ENVIRONMENTAL Inc.

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
1145001	A3-S1	Miscell.
1145002	A3-S2	Miscell.
1145003	A3-S3A	Miscell.
1145004	A3-S3B	Miscell.
1145005	A3-S3C	Miscell.
1145006	A3-S4	Miscell.
1145007	A3-S5	Miscell.
1145008	A3-S3AR	Miscell.
1145009	A3-S3BR	Miscell.
1145010	A3-S3CR	Miscell.
1145011	A3-W1	Miscell.
1145012	A3-W2	Miscell.
1145013	A3-W3A	Miscell.
1145014	A3-W3B	Miscell.
1145015	A3-W3C	Miscell.
1145016	A3-W4	Miscell.
1145017	A3-W5	Miscell.
1145018	A3-W3AR	Miscell.
1145019	A3-W3BR	Miscell.
1145020	A3-W3CR	Miscell.
1145021	A3-C1	Miscell.
1145022	A3-C2	Miscell.
1145023	A3-C3A	Miscell.
1145024	A3-C3B	Miscell.
1145025	A3-3C3	Miscell.
1145026	A3-C4	Miscell.
1145027	A3-C5	Miscell.
1145028	A3-C3AR	Miscell.
1145029	A3-C3BR	Miscell.
1145030	A3-C3CR	Miscell.

CHAIN OF CUSTODY RECORD

FACILITY/LOCATION:	METHOD OF SHIPMENT:
EXXON BAYWAY	TO NYTEST FROM ASI

SAMPLING AND ANALYSES AUTHORIZED BY:	DATE:

SAMPLE #	SAMPLING LOCATION AND DESCRIPTION	DATE	TIME	SAMPLE TYPE C	SAMPLE TYPE G	SAMPLE TYPE SOLID	# OF CONT.	ANALYSES REQUIRED
	N. virens CONTROL					TISSUE	3	
	N. virens REFERENCE						6	
	N. virens AREA 1						6	COMBINE 5A
	N. virens AREA 2						6	& 5B
	N. virens AREA 3						6	FOR QA ANALYSIS
	P. pugio CONTROL						3	
	P. pugio REFERENCE						6	COMBINE
	P. pugio AREA 1						6	5A & 5B
	P. pugio AREA 2						6	

SAMPLE COLLECTED BY:	EXACT SAMPLING LOCATION:		
ASI	Bayway Trailer		
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
C.W. Douglass	Robert Fenlaw	2/11/92	1:00 PM
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
Robert Fenlaw	[illegible]	2-11-92	6 PM
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME

SAMPLE RELINQUISHED AFTER ANALYSES:	ANALYZED SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE DESCRIPTION:	# OF CONTAINERS:		

FORM № 2274

AQUA SURVEY, INC.

CHAIN OF CUSTODY RECORD

FACILITY/LOCATION:	METHOD OF SHIPMENT:
EXXON BAYWAY	TO NYTEST FROM ASI
SAMPLING AND ANALYSES AUTHORIZED BY:	DATE:

SAMPLE #	SAMPLING LOCATION AND DESCRIPTION	DATE	TIME	SAMPLE TYPE C	SAMPLE TYPE G	SAMPLE TYPE SOLID	# OF CONT.	ANALYSES REQUIRED
	P. pugio AREA 3					TISSUE	~~3~~ 6	COMBINE 5A + 5B
	M. mercenaria CONTROL					|	3	
	M. mercenaria REFERENCE					|	6	} COMBINE
	M. mercenaria AREA 1					|	6	} 5A + 5B
	M. mercenaria AREA 2					|	6	} FOR QA/QC
	M. mercenaria AREA 3					/	6	}

SAMPLE COLLECTED BY:	EXACT SAMPLING LOCATION:		
ASI	Bayway Refinery		
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
W. S. Douglas	Peter Semeredo	2-11-92	1:00
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
Peter Semeredo	Robert Watts	2-11-92	6 PM.
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE RELINQUISHED BY:	SAMPLE RECEIVED BY:	DATE	TIME

SAMPLE RELINQUISHED AFTER ANALYSES:	ANALYZED SAMPLE RECEIVED BY:	DATE	TIME
SAMPLE DESCRIPTION:	# OF CONTAINERS:		

FORM № 2272

AQUA SURVEY, INC.

nytest environmental inc.

REPORT OF ANALYSIS

Log In No: 11449

Pre-Test Organisms (in Triplicate)

Results in mg/kg:

Identification		Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
Nereis virens						
1144901	A	<0.25	<0.20	<0.1	<0.04	<0.02
1144902	B	<0.25	<0.20	<0.1	<0.04	<0.02
1144903	C	<0.25	<0.20	<0.1	<0.04	<0.02
Mercenaria mercenaria						
1144904	A	<0.25	<0.20	<0.1	<0.04	<0.02
1144905	B	<0.25	<0.20	<0.1	<0.04	<0.02
1144906	C	<0.25	<0.20	<0.1	<0.04	<0.02
Paleamonetes pugio						
1144907	A	<0.25	<0.20	<0.1	<0.04	<0.02
1144908	B	<0.25	<0.20	<0.1	<0.04	<0.02
1144909	C	<0.25	<0.20	<0.1	<0.04	<0.02

nytest environmental inc

REPORT OF ANALYSIS

Log In No: 11449

BIOACCUMULATION ANALYSIS
AREA 1

NEREIS VIRENS

Results in mg/kg:

Identification		Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144917	1	<0.25	<0.20	<0.1	<0.04	<0.02
1144918	2	<0.25	<0.20	<0.1	<0.04	<0.02
1144919	3A	<0.25	<0.20	<0.1	<0.04	<0.02
1144920	3B	<0.25	<0.20	<0.1	<0.04	<0.02
1144921	3C	<0.25	<0.20	<0.1	<0.04	<0.02
1144922	4	<0.25	<0.20	<0.1	<0.04	<0.02
1144923	5	<0.25	<0.20	<0.1	<0.04	<0.02
TEST						
1144941	1	<0.25	<0.20	<0.1	<0.04	<0.02
1144942	2	<0.25	<0.20	<0.1	<0.04	<0.02
1144943	3A	<0.25	<0.20	<0.1	<0.04	<0.02
1144944	3B	<0.25	<0.20	<0.1	<0.04	<0.02
1144945	3C	<0.25	<0.20	<0.1	<0.04	<0.02
1144946	4	<0.25	<0.20	<0.1	<0.04	<0.02
1144947	5	<0.25	<0.20	<0.1	<0.04	<0.02
1144948	3A*	**	**	<0.1	<0.04	<0.02
1144949	3B*	**	**	<0.1	<0.04	<0.02
1144950	3C*	**	**	<0.1	<0.04	<0.02

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

00120

nytest environmental inc.

REPORT OF ANALYSIS

Log In No: 11449

BIOACCUMULATION ANALYSIS
AREA 1

MERCENARIA MERCENARIA

Results in mg/kg:

Identification		Lead	Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144924	1	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144925	2	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144926	3A	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144927	3B	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
144928	3C	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144929	4	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144930	5	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
TEST							
1144951	1	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144952	2	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144953	3A	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144954	3B	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144955	3C	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144956	4	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144957	5	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144958	3A*	**	**	**	<0.1	<0.04	<0.02
1144959	3B*	**	**	**	<0.1	<0.04	<0.02
1144960	3C*	**	**	**	<0.1	<0.04	<0.02

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

nytest environmental inc

REPORT OF ANALYSIS

Log In No: 11449

BIOACCUMULATION ANALYSIS
AREA 1

PALEAMONETES PUGIO

Results in mg/kg:

Identification		Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144910	1	<0.25	<0.20	<0.1	<0.02	<0.04
1144911	2	<0.25	<0.20	<0.1	<0.02	<0.04
1144912	3A	<0.25	<0.20	<0.1	<0.02	<0.04
1144913	3B	<0.25	<0.20	<0.1	<0.02	<0.04
144914	3C	<0.25	<0.20	<0.1	<0.02	<0.04
1144915	4	<0.25	<0.20	<0.1	<0.02	<0.04
1144916	5	<0.25	<0.20	<0.1	<0.02	<0.04
TEST						
1144931	1	<0.25	<0.20	<0.1	<0.02	<0.04
1144932	2	<0.25	<0.20	<0.1	<0.02	<0.04
1144933	3A	<0.25	<0.20	<0.1	<0.02	<0.04
1144934	3B	<0.25	<0.20	<0.1	<0.02	<0.04
1144935	3C	<0.25	<0.20	<0.1	<0.02	<0.04
1144936	4	<0.25	<0.20	<0.1	<0.02	<0.04
1144937	5	<0.25	<0.20	<0.1	<0.02	<0.04
1144938	3A*	**	**	<0.1	<0.02	<0.04
1144939	3B*	**	**	<0.1	<0.02	<0.04
1144940	3C*	**	**	<0.1	<0.02	<0.04

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

nytest environmental inc.

REPORT OF ANALYSIS

Log In No: 11449

BIOACCUMULATION ANALYSIS
AREA 2

NEREIS VIRENS

Results in mg/kg:

Identification		Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144917	1	<0.25	<0.20	<0.1	<0.04	<0.02
1144918	2	<0.25	<0.20	<0.1	<0.04	<0.02
1144919	3A	<0.25	<0.20	<0.1	<0.04	<0.02
1144920	3B	<0.25	<0.20	<0.1	<0.04	<0.02
144921	3C	<0.25	<0.20	<0.1	<0.04	<0.02
144922	4	<0.25	<0.20	<0.1	<0.04	<0.02
1144923	5	<0.25	<0.20	<0.1	<0.04	<0.02
TEST						
1144971	1	<0.25	<0.20	<0.1	<0.04	<0.02
1144972	2	<0.25	<0.20	<0.1	<0.04	<0.02
1144973	3A	<0.25	<0.20	<0.1	<0.04	<0.02
1144974	3B	<0.25	<0.20	<0.1	<0.04	<0.02
1144975	3C	<0.25	<0.20	<0.1	<0.04	<0.02
1144976	4	<0.25	<0.20	<0.1	<0.04	<0.02
1144977	5	<0.25	<0.20	<0.1	<0.04	<0.02
1144978	3A*	**	**	<0.1	<0.04	<0.02
1144979	3B*	**	**	<0.1	<0.04	<0.02
1144980	3C*	**	**	<0.1	<0.04	<0.02

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

nytest environmental inc.

REPORT OF ANALYSIS

Log In No:11449

BIOACCUMULATION ANALYSIS
AREA 2

MERCENARIA MERCENARIA

Results in mg/kg:

Identification		Lead	Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144924	1	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144925	2	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144926	3A	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144927	3B	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
144928	3C	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
144929	4	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144930	5	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
TEST							
1144981	1	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144982	2	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144983	3A	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144984	3B	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144985	3C	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144986	4	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144987	5	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144988	3A*	**	**	**	<0.1	<0.04	<0.02
1144989	3B*	**	**	**	<0.1	<0.04	<0.02
1144990	3C*	**	**	**	<0.1	<0.04	<0.02

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

nytest environmental inc.

REPORT OF ANALYSIS

Log In No: 11449

BIOACCUMULATION ANALYSIS
AREA 2

PALEAMONETES PUGIO

Results in mg/kg:

Identification		Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144910	1	<0.25	<0.20	<0.1	<0.02	<0.04
1144911	2	<0.25	<0.20	<0.1	<0.02	<0.04
1144912	3A	<0.25	<0.20	<0.1	<0.02	<0.04
1144913	3B	<0.25	<0.20	<0.1	<0.02	<0.04
144914	3C	<0.25	<0.20	<0.1	<0.02	<0.04
1144915	4	<0.25	<0.20	<0.1	<0.02	<0.04
1144916	5	<0.25	<0.20	<0.1	<0.02	<0.04
	TEST					
1144961	1	<0.25	<0.20	<0.1	<0.02	<0.04
1144962	2	<0.25	<0.20	<0.1	<0.02	<0.04
1144963	3A	<0.25	<0.20	<0.1	<0.02	<0.04
1144964	3B	<0.25	<0.20	<0.1	<0.02	<0.04
1144965	3C	<0.25	<0.20	<0.1	<0.02	<0.04
1144966	4	<0.25	<0.20	<0.1	<0.02	<0.04
1144967	5	<0.25	<0.20	<0.1	<0.02	<0.04
1144968	3A*	**	**	<0.1	<0.02	<0.04
1144969	3B*	**	**	<0.1	<0.02	<0.04
1144970	3C*	**	**	<0.1	<0.02	<0.04

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

nytest environmental inc

REPORT OF ANALYSIS

Log In No: 11450

BIOACCUMULATION ANALYSIS
AREA 3

NEREIS VIRENS

Results in mg/kg:

Identification		Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144917	1	<0.25	<0.20	<0.1	<0.04	<0.02
1144918	2	<0.25	<0.20	<0.1	<0.04	<0.02
1144919	3A	<0.25	<0.20	<0.1	<0.04	<0.02
1144920	3B	<0.25	<0.20	<0.1	<0.04	<0.02
144921	3C	<0.25	<0.20	<0.1	<0.04	<0.02
1144922	4	<0.25	<0.20	<0.1	<0.04	<0.02
1144923	5	<0.25	<0.20	<0.1	<0.04	<0.02
TEST						
1145011	1	<0.25	<0.20	<0.1	<0.04	<0.02
1145012	2	<0.25	<0.20	<0.1	<0.04	<0.02
1145013	3A	<0.25	<0.20	<0.1	<0.04	<0.02
1145014	3B	<0.25	<0.20	<0.1	<0.04	<0.02
1145015	3C	<0.25	<0.20	<0.1	<0.04	<0.02
1145016	4	<0.25	<0.20	<0.1	<0.04	<0.02
1145017	5	<0.25	<0.20	<0.1	<0.04	<0.02
1145018	3A*	**	**	<0.1	<0.04	<0.02
1145019	3B*	**	**	<0.1	<0.04	<0.02
1145020	3C*	**	**	<0.1	<0.04	<0.02

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

nytest environmental inc.

REPORT OF ANALYSIS

Log In No: 11450

BIOACCUMULATION ANALYSIS
AREA 3

MERCENARIA MERCENARIA

Results in mg/kg:

Identification		Lead	Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144924	1	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144925	2	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144926	3A	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144927	3B	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
144928	3C	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
144929	4	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1144930	5	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
TEST							
1145021	1	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1145022	2	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1145023	3A	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1145024	3B	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1145025	3C	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1145026	4	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1145027	5	<0.10	<0.25	<0.20	<0.1	<0.04	<0.02
1145028	3A*	**	**	**	<0.1	<0.04	<0.02
1145029	3B*	**	**	**	<0.1	<0.04	<0.02
1145030	3C*	**	**	**	<0.1	<0.04	<0.02

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

nytest environmental inc.

REPORT OF ANALYSIS

Log In No: 11450

BIOACCUMULATION ANALYSIS
AREA 3

PALEAMONETES PUGIO

Results in mg/kg:

Identification		Lead	Cadmium	Mercury	Total Petroleum Hydrocarbons AS C-10	PCB's	DDT's
1144910	1	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1144911	2	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1144912	3A	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1144913	3B	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
144914	3C	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1144915	4	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1144916	5	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
TEST							
1145001	1	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1145002	2	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1145003	3A	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1145004	3B	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1145005	3C	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1145006	4	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1145007	5	<0.10	<0.25	<0.20	<0.1	<0.02	<0.04
1145008	3A*	**	**	**	<0.1	<0.02	<0.04
1145009	3B*	**	**	**	<0.1	<0.02	<0.04
1145010	3C*	**	**	**	<0.1	<0.02	<0.04

* RE-EXTRACTED SAMPLES
** METALS COULD NOT BE RE-EXTRACTED

MSR
0184

CENAN-OP-R

MEMORANDUM FOR: Chief, Water Quality Compliance Branch

SUBJECT: Pre-Application Request for Sampling Scheme for Ocean Disposal of Dredged Material by Exxon Company, U.S.A. for Barge Piers A and B at the Bayway Refinery on the Arthur Kill in the City of Linden, Union County, New Jersey

1. We are requesting the following:

____ a. Analysis of the testing which has been submitted as part of the above application. Please indicate the completeness of the testing package and whether the proposed dredged material satisfies the Ocean Dumping Criteria.

____ b. Evaluation of the environmental significance of the mixing zone from the intentional barge overflow at the dredging site. This will be used in an evaluation of the proposed activity in accordance with the guidelines promulgated under Section 404(b)(1) of the Clean Water Act of 1972.

____ c. The presence of a Water Quality Compliance Section representative at a pre-application meeting with _____ _____ _____.

XXXX d. A sampling scheme and checklist of required testing for the subject project as further described in the attached information.

____ e. Review of the attached draft public notice for completeness and accuracy.

____ f. Request for re-authorization based upon the attached information.

____ g. Other.

2. It is requested that you respond within **fourteen (14)** working days to allow our expeditious processing of this application.

NOTE: Exxon has previously carried out a round of testing for the entire proposed dredge area; the sediment did not meet the criteria for disposal of dredged material at the Ocean Dump Site. Therefore, this request is for a sampling scheme that divides the proposed dredge area into three smaller, separate dredge areas.

NIEVES

JOSEPH J. SEEBODE
Chief, Regulatory Branch

RZT
TOMER

Attachments

SEEBODE

DISPOSITION FORM

For use of this form, see AR340-15; the proponent agency is TAGO.

Reference or office symbol	subject - Review of Bioassay Data:
CENAN-OP-W	EXXON - Bayway Refinery (Preapplication) ARTHUR KILL, Linden NJ

to: MEMO FOR THE RECORD from: CENAN-OP-W date: 28 Aug 90 CMT
WONG/YAREMKO/x5621

1. Enclosed is an interpretive summary of the results of three-phased bioassays performed on dredged material composited from 12 sampling sites (shown on enclosed map) located in the Arthur Kill.
Bioassays were run in accordance with "Ecological Evaluation of Proposed Discharge of Dredged Material into Ocean Waters", which is the Implementation Manual for Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972. At the time the samples were collected, the 21 Dec 84 edition of the NYD/EPA Region 2 Guidance Manual was in effect.

2. Bioassays were performed by New York Testing Laboratories, Inc.. Samples were collected on 9 & 12 March 1990 and test results were completed on 31 Mar 90.

3. All samples consisted of cores to project depth.
Stratification was not observed in sample cores. Grain size analyses indicated the proposed material to average:

sand: 60.54%
silt: 26.10%
clay: 13.37%

4. Analysis of the results for the three phases indicates that the LPC for this material is not within acceptable limits as defined in the EPA Ocean Dumping Regulations and the Corps/EPA Implementation Manual. *

5. Results of bioaccumulation analyses performed on organisms surviving the solid phase testing are also enclosed. An evaluation of these data indicates that the proposed dredge material does not exhibit an environmentally significant bioaccumulation potential.

mg 17 Oct

MONTE GREGES
Chief, Water Quality Compliance Section

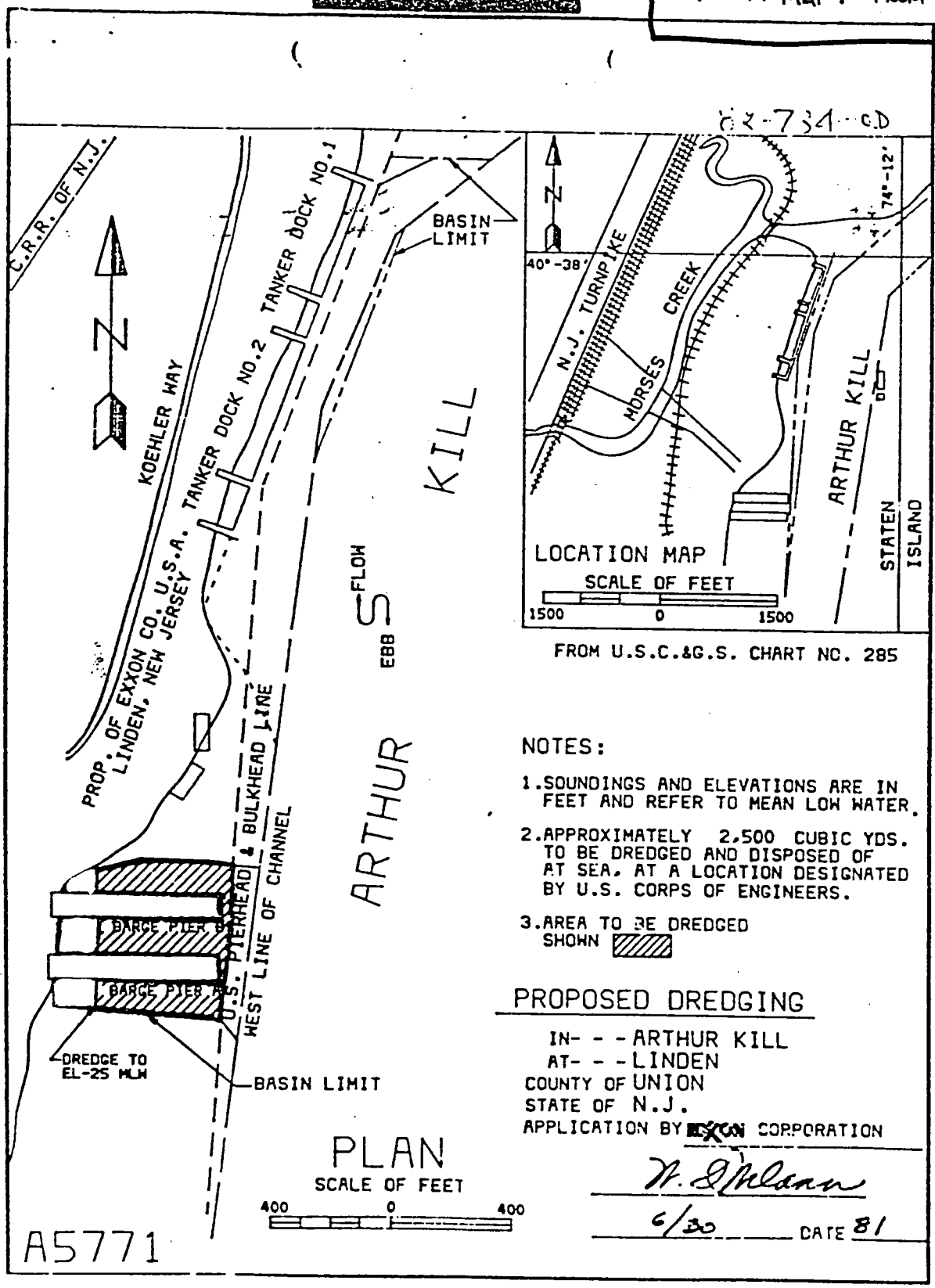
* Toxicity in Solid Phase bioassays was stat. sig. diff. @ >10% for N. virens.

DA form 2496

0 0 0 3

EXXON, USA - Bayways Refinery
(Pre-App)

LOCATION MAP: FROM PERMIT #12883



NOTES:

1. SOUNDINGS AND ELEVATIONS ARE IN FEET AND REFER TO MEAN LOW WATER.
2. APPROXIMATELY 2,500 CUBIC YDS. TO BE DREDGED AND DISPOSED OF AT SEA, AT A LOCATION DESIGNATED BY U.S. CORPS OF ENGINEERS.
3. AREA TO BE DREDGED SHOWN ▨

PROPOSED DREDGING

IN- - - ARTHUR KILL
AT- - - LINDEN
COUNTY OF UNION
STATE OF N.J.
APPLICATION BY EXXON CORPORATION

N. D'Adamo

6/30 DATE 81

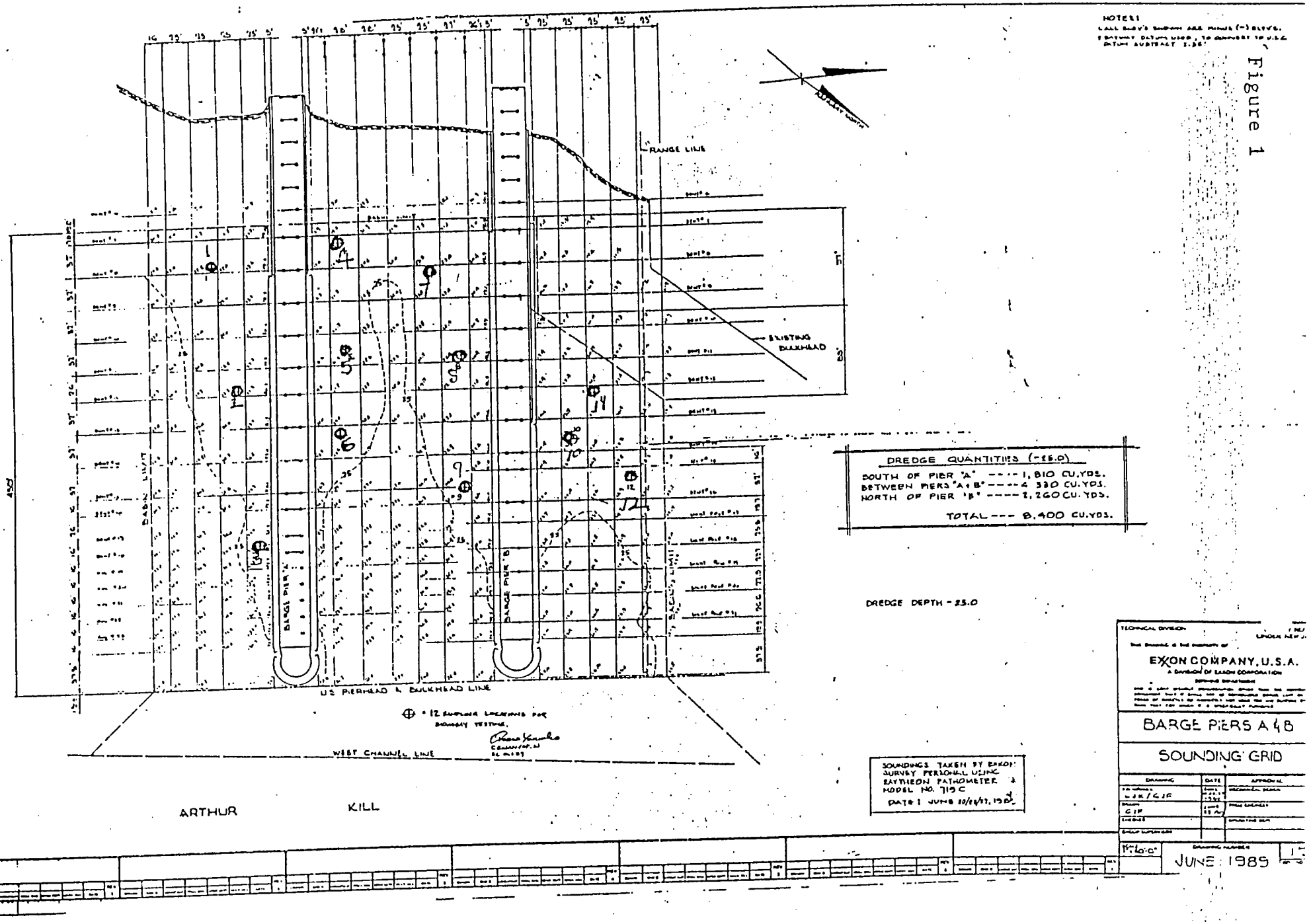

NOTES:
ALL BLDG'S SHOWN ARE MINUS (-) ELEVS.
RANGE LINE
EXISTING BULKHEAD
BARGE PIER 'A'
BARGE PIER 'B'
BASIN LIMIT
BASIN LIMIT
US PIERHEAD & BULKHEAD LINE
WEST CHANNEL LINE
ARTHUR KILL
DREDGE QUANTITIES (-25.0)
SOUTH OF PIER 'A' ---- 1,810 CU.YDS.
BETWEEN PIERS 'A & B' ---- 4,330 CU.YDS.
NORTH OF PIER 'B' ---- 2,260 CU.YDS.
TOTAL --- 8,400 CU.YDS.
DREDGE DEPTH - 25.0
SOUNDINGS TAKEN BY EXXON SURVEY PERSONNEL USING RAYTHEON PATHOMETER MODEL NO. 719 C
DATE: JUNE 10/15/17, 1989
EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION
BARGE PIERS A & B
SOUNDING GRID
JUNE 1989

Figure 1

3

Table 1. BIOASSAY RESULTS (96 hour test)

Applicant: Pre-App: Exxon - Bayway Refinery

	LC_50 or EC_50 (critical)	LPC after 4 hours	DILUTION after 4 hours
LIQUID PHASE			
Skeletonema costatum	--- %	--- %	0.0038 %
Mysidopsis bahia	--- %	--- %	
Menidia menidia	--- %	--- %	
SUSPENDED PARTICULATE PHASE			
Acartia tonsa	--- %	--- %	0.0038 %
Mysidopsis bahia	--- %	--- %	
Menidia menidia	--- %	--- %	

LC_50 - Lethal Concentration resulting in 50% mortality
EC_50 - Effective Concentration resulting in 50% inhibition (applies to phytoplankton)
LPC - Limiting Permissible Concentration (0.01 times critical EC_50 or LC_50)

SOLID PHASE (10 day test)	% SURVIVAL Cont (SDc)	Ref (SDr)	Test (SDt)	DIFF (SDd)	Is difference statistically significant? (p = 0.5)	"F" statistic =(d/SDdDd)^2	D.F.
Palaemonetes pugio	90.7 (5.51)	97.0 (1.00)	90.4 (12.03)	6.6 (5.40)	NO	1.494	8
Mercenaria mercenaria	98.3 (2.89)	89.0 (5.48)	96.0 (4.18)	-7.0 (3.08)	NO	5.158	8
Nereis virens	90.0 (5.00)	93.0 (2.74)	78.0 (9.75)	15.0 (4.53)	YES*	10.976	8
Total Community	93.0 (5.66)	93.0 (4.74)	88.1 (11.58)	4.9 (3.23)	NO	2.269	28

* = significant at 95% confidence level, but test < reference
** = significant at 95% confidence level, and test > reference
*** = significant at 95% confidence level, and test > reference, and difference between test and reference is greater than 10
\# = Control survival is less than 90%
SDc = standard deviation of control
SDr = standard deviation of reference sediment
SDt = standard deviation of test sediment
SDd = standard deviation of difference between means
DIFF = reference - test
D.F. = degrees of freedom

Table 4. Dilution Evaluation based on Tetra Tech Model

Applicant: Pre-App: Exxon - Bayway Refinery

The dilution of the proposed dredged meterial has been evaluated by use of the Tetra Tech computer model. A description of the model has been published as Technical Report D-78-47 of the Corps' Dredged Material Research Program, and is entitled Evaluation and Calibration of the Tetra-Tech Dredged Material Disposal Models Based on Field Data. The New York District requested that a study be conducted which would give example dilutions resulting from typical disposal operations and dredged material found in the New York District. This study has been completed and is entitled Discussion of Dredged Material Disposal Models and Their Application for the New York District.

This evaluation is based on model run number 18, which most closely approximates the project disposal operations and dredged material.

Based on this model run, the dilution of the material at four hours is predicted to be 0.0038%.

The model run selected most closely approximates the project material for the parameter of percent moisture content, because this parameter is the most sensitive.

Moisture content is 66.18%.

Table 5a. BIOACCUMULATION TEST RESULTS (10 Day Laboratory Test)

Applicant: Pre-App: Exxon - Bayway Refinery

n = 3

			MEAN	S.D.	DIFF	SDd	"F"	C.V. repl(3)	C.V. sub(n)	% Recovery
	Palaemonetes	Ref	<0.10	---	---	---	---	---	---	---
		Test	<0.10	---				---	---	
Pet										
Hydro	Mercenaria	Ref	<0.10	---	---	---	---	---	---	---
		Test	<0.10	---				---	---	
0.10										
ppm	Nereis	Ref	<0.10	---	---	---	---	---	---	---
		Test	<0.10	---				---	---	
	Palaemonetes	Ref	<0.04	---	---	---	---	---	---	---
		Test	<0.04	---				---	---	
PCB										
	Mercenaria	Ref	<0.04	---	---	---	---	---	---	---
0.04		Test	<0.04	---				---	---	
ppm										
	Nereis	Ref	<0.04	---	---	---	---	---	---	---
		Test	<0.04	---				---	---	
	Palaemonetes	Ref	<0.20	---	---	---	---	---	---	XXXX
		Test	<0.20	---				---	---	
Hg										
	Mercenaria	Ref	<0.20	---	---	---	---	---	---	XXXX
0.20		Test	<0.20	---				---	---	
ppm										
	Nereis	Ref	<0.20	---	---	---	---	---	---	XXXX
		Test	<0.20	---				---	---	

‡ = Statistically Significant (95% confidence level), but Test less than Reference, so no environmental significance

‡‡ = Statistically Significant (95% confidence level), and Test greater than Reference, so therefore results are environmentally significant

Table 5b. BIOACCUMULATION TEST RESULTS (10 Day Laboratory Test)

Applicant: Pre-App: Exxon - Bayway Refinery

n = 3

			MEAN	S.D.	DIFF	SDd	"F"	C.V. repl(3)	C.V. sub(n)	% Recovery
Cd 0.25 ppm	Palaemonetes	Ref	<0.25	---	---	---	---	---	---	XXXX
		Test	<0.25	---				---	---	
	Mercenaria	Ref	<0.25	---	---	---	---	---	---	XXXX
		Test	<0.25	---				---	---	
	Nereis	Ref	<0.25	---	---	---	---	---	---	XXXX
		Test	<0.25	---				---	---	
DDT 0.02 ppm	Palaemonetes	Ref	<0.02	---	---	---	---	---	---	---
		Test	<0.02	---				---	---	
	Mercenaria	Ref	<0.02	---	---	---	---	---	---	---
		Test	<0.02	---				---	---	
	Nereis	Ref	<0.02	---	---	---	---	---	---	---
		Test	<0.02	---				---	---	

‡ = Statistically Significant (95% confidence level), but Test less than Reference, so no environmental significance

‡‡ = Statistically Significant (95% confidence level), and Test greater than Reference, so therefore results are environmentally significant

Table 6. ELUTRIATE TEST RESULTS (10 Day Laboratory Tests)

Applicant: Pre-App: Exxon - Bayway Refinery

CHEMICAL CONSTITUENT	SITE WATER	(S.D.)	ELUTRIATE	(S.D.)	DIFF	(SDd)	"F"	D.F.
Pet Hydro	<50	(---)	<50	(---)	---	(---)	---	---
PCB's	<0.1	(---)	<0.1	(---)	---	(---)	---	---
Hg	<0.2	(---)	<0.2	(---)	---	(---)	---	---
Cd	<0.1	(---)	<0.1	(---)	---	(---)	---	---
DDT	<0.05	(---)	<0.05	(---)	---	(---)	---	---

Values are in ppb

* = Statistically Significant (95% confidence level), but Elutriate less than Site Water so no environmental significance

** = Statistically Significant (95% confidence level), and Elutriate greater than Site Water so therefore results are environmentally significant

DIFF = ELUTRIATE - SITE WATER

D.F. = Degrees of freedom = 2(n-1)

$$SDd = \sqrt{(SDs^2 + SDe^2)/n}$$

TABLE 7. BULK SEDIMENT ANALYSIS

Applicant: Pre-App: Exxon - Bayway Refinery

n = 12	MEAN	S.D.	units
Cu	331.1	96.27	mg/kg (ppm)
Ni	43.8	4.14	mg/kg (ppm)
Zn	404.3	65.61	mg/kg (ppm)
% Moisture	66.2	3.52	%
Total Organic C (loss on ignition)	62750	17457.1	mg/kg (ppm)

EXXON CO, USA - Bayway Refinery (Pre-App)

SECTION 404b EVALUATION

A) Elutriate Test Evaluation:

1. Mixing Zone Calculation (based on M.P. D-76-17)

Current Velocity: Max Ebb: 0.8 knots [1.689 fps/knots] · (1/2) = 0.68 fps

Rate of Overflow: 8.1 ft³/sec

If L= front edge of mixing zone
t= time (in seconds)
R= ½ width of source of overflow (84 ft)
r= radius of source of overflow (84 ft)
λ= turbulent dissapation parameter (0.005)
X= horizontal distance from source
Vw= current velocity
d= depth of channel (.25 ft.)

Then $L = \sqrt{\left(\frac{t(\lambda) + 0.149\ R^{.66}}{0.094}\right)^3}$ (t=1sec) = 160.8 ft

$A = X\left(\frac{L + 2r}{2}\right) = 112\ ft^2$

X= Vw·t = 0.68 ft.

Volume of mixing zone (Vm)= 2,795 ft³

2. Dillution Calculations

% dilution of elutriate (De) = $\frac{\text{Standard conc.-Ambient conc.}}{\text{Elutriate conc.-Standard conc.}} \times 100$

% dilution of overflow (D) = $\frac{\text{Volume of overflow (Vo)}}{\text{Volume of mixing zone (Vm)}} \times 100$

In order to meet water quality standards, the % dilution of overflow must not exceed the lowest % dilution of the elutriate necessary to reach ambient concentrations.

Chemical Constituent	De
All constituents tested were below detection	

Comments: _____

EXXON CO, USA - Baytown Refinery (TEXAS)

Total surface area of channel: ~ 500 ft x 500 ft = 250 000 ft²

t	% dilution	area affected	% of total area
1 sec	0.29 %	112 ft²	<<< 1%

*overflow has ceased

Based on the elutriate/~~bioassay~~ testing done, this material will dilute to acceptable levels in 1 sec affecting 112 ft² or << 1 % of the total area of the channel.

Comments:

29 Nov 1990

Meeting to Discuss the Exxon Corporation Proposal to Dredge in the Arthur Kill at Linden, Union County, New Jersey.

Name	Firm	Telephone
Sherman C Brown	Exxon Co USA, Bayway Refinery	201 474 6380
DAVID L. BRANDON	EXXON CO, U.S.A., BAYWAY REFINERY	(201) 474-6022
Mark L. Hinman	Exxon Biomedical Sciences, Inc	(908) 873-6112
OKSANA YAREMKO	COE, WATER QUALITY	212 264-5621
Joseph, OLHA	COE, WATER QUALITY	212 264 5621
Mark Rth	COE REGULATORY BR	212 264 3184
GEORGE NIEVES	" "	212 264-0182
Monte Greges		264-5021

EXXON COMPANY, U.S.A.

POST OFFICE BOX 222 • LINDEN, NEW JERSEY 07036-0222

REFINING DEPARTMENT
BAYWAY REFINERY

RECEIVED
CORPS OF ENGINEERS
OCT 17 12 30 PM '90

October 16, 1990

Renewal of Maintenance Dredging Permit for "A" and "B" Barge Piers at the Bayway Refinery - Proposal To Resolve Concern For Bioassay

Department of the Army
Operations Division
New York District, Corps of Engineers
26 Federal Plaza
New York, New York 10278-0090

ATTN: Mr. Joseph Seebode - Chief, Regulatory Branch

Dear Mr. Seebode:

Exxon Company, U.S.A.'s Bayway Refinery has been working with the New York District Army Corps of Engineers to renew the dredging permit for our "A" and "B" Barge Piers. Ocean disposal of the dredge spoils has been requested. Through communication with the District Engineer, Mr. George Nieves, we have learned that while in the process of reviewing bioassay, bioaccumulation, and bulk sediment test results for samples taken from the proposed dredge site, the Corps' Water Quality Branch expressed concern about a somewhat elevated mortality rate of Nereis Virens during the ten-day Solid Phase Bioassay.

Review of the bioaccumulation analysis results for this species, along with the results of the elutriate and bulk sediment testing have not given the Corps or Exxon an explanation for the mortality rate among the Nereis Virens. It does not appear that exposure to the test sediment caused the organisms to die since no detectable difference in tissue concentration for the contaminants tested exists between control and test organisms. The laboratory is not required to perform standard toxicant testing on organisms used for Solid Phase Bioassays, and no Reference Toxicity Data exists for the Nereis Virens. Without such data, we are unsure of the initial health of the test organisms. Poor health could have influenced the survival rate.

To resolve this concern, we propose to submit samples from the original sample sites to the same laboratory for 10-day Solid Phase Bioassay testing only using the Nereis Virens.

Your prompt response to this proposal is requested so that we may proceed with the steps necessary to complete the permit acquisition process.

Please contact S. C. Brown at (201) 474-6390, or D. L. Brandon at (201) 474-6022, should you require additional information.

Very truly yours,

S. C. Brown
Senior Staff Engineer

DLB/vob

EXXON COMPANY, U.S.A.
POST OFFICE BOX 222 • LINDEN, NEW JERSEY 07036-0222

REFINING DEPARTMENT
BAYWAY REFINERY

REGISTERED MAIL - RRR

September 13, 1990

New Jersey Department of
Environmental Protection Form CP-1
Maintenance Dredging - "A" & "B" Barge
Piers, Arthur Kill, Linden, New Jersey

Department of the Army
Operations Division
New York District, Corps of Engineers
26 Federal Plaza
New York, New York 10278-0090

Attn: Mr. George Nieves
Project Manager, Ocean Disposal
Western Permits Section

Dear Sir:

In conformance with regulations of the New Jersey Department of Environmental Protection, attached are three (3) copies of Department Form CP-1, Application for Permit.

The form covers our application for permits associated with maintenance dredging at "A" & "B" barge basins on the Arthur Kill at Exxon Corporation's Bayway Refinery in Linden, New Jersey.

Please contact the writer at (201) 474-6390 if you require additional information.

Very truly yours,

D. L. Brandon

D. L. Brandon

DLB/dw

Form DCR - 003
1/90

NJ DEP Division of Coastal Resources

PERMIT APPLICATION TRANSMITTAL

TO
- [ ] Division of Coastal Resources
- [-] Bureau of Coastal Enforcement
- [ ] Bureau of Coastal Engineering
- [-] Technical Services Section
- [-] Bureau of Tidelands
- [-] Division of Fish, Game and Wildlife
- [ ] Division of Solid Waste Management
- [ ] Division of Hazardous Waste Management
- [ ] Office of Natural Lands Management
- [ ] Office of New Jersey Heritage
- [ ] Pinelands Commission
- [ ] Green Acres
- [ ] US EPA
- [ ] Department of Transportation
- [-] Geodetic Survey
- [ ] Division of Water Resources
- [-] Bureau of Marine Water Classification and Analysis
- [ ] Bureau of Water Quality Planning
- [ ] Bureau of Connection and Construction Permits
- [-] Bureau of Monitoring Management
- [ ] Bureau of Water Quality Standards and Analysis
- [ ] Bureau of Water Allocation
- [ ] Bureau of Municipal Discharge Permits
- [ ] Bureau of Industrial Discharge Permits
- [ ] Division of Environmental Quality
- [-] US Army Corps of Engineers (N.Y. DISTRICT)
- [ ] Other _____

FROM: Regulatory Element, Coastal/Inland
501 East State Street - Station Plaza 5
Trenton, New Jersey 08625

Project Review Officer: MARK JOSEPH Phone: _____

SUBJECT: Permit Transmittal [ ] CAFRA [ ] Wetlands [X] Waterfront [ ] Upland Waterfront [ ] Stream Encroachment [ ] FWW

DOCKET #: 2009-90-0003.2 RECEIPT DATE: _____

APPLICANT: EXXON CORP.

SITE: LINDEN, UNION CO.

Attached is a DCR regulatory permit application. Please review the application for its completeness and send notice, as to its completeness or deficient status by dates listed. If you do not choose to respond by the requested response date, it is assumed the application is complete for filing. If complete, kindly note your approval, disapproval and comments if any, on this sheet and return. If you propose an alternate use or design, please annote a photocopy and return with your reply.

[ ] Please provide a copy of the final permit or decision upon issuance to: _____

[ ] A site inspection by the Division of Fish, Game and Wildlife should be performed.

[X] TSS - RICK RILEY [X] Please determine if this project will require a Stream Encroachment Permit and respond by the completeness comments due date.
[ ] Please review this project on its engineering aspects and coordinate your review with the project officer no later than the review comments due date.

TRANSMITTAL DATE: 10/12/90

COMPLETENESS COMMENTS DUE DATE: 10/25/90
- (X) 20 Day Administrative Review
- ( ) Additional Information Submission

REVIEW COMMENTS DUE DATE: 11/9/90
- ( ) Preliminary Analysis Review
- (X) Final Review

COMMENTS:

Let's protect our earth

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

STANDARD APPLICATION FORM (CP # 1)
CONSTRUCTION AND DISCHARGE PERMITS

FOR OFFICIAL USE

RECEIVED
DEPT ENVIR PROTECT
SEP 28 2 53 PM '90

READ REQUIREMENTS
PLEASE TYPE OR PRINT

1. Applicant/Owner* Exxon Corporation Telephone (201) 474-6390

   Permanent Legal Address Bayway Refinery, 1400 Park Avenue

   City or Town Linden State New Jersey Zip Code 07036

2. Location of Work Site Bayway Refinery

   Name of Facility, if applicable

   Street/Road

   Lot No. 5 Block No. 586

   City or Town State Zip Code

   Municipality Linden County Union

3. If applicable, give name of: Engineer/Surveyor/Well Driller/Geologist/Soil Scientist *(Specify).*

   Name P. J. Low-Beer N.J. License No. 13550

   Name of Firm, if employee Exxon Company, U.S.A.

   Address P. O. Box 222 County Union

   Municipality Linden State New Jersey Zip Code 07036

   Telephone (201) 474-7472

4. This is an application for Waterfront Development - Maintenance Dredge Permit
   (Name of permit, certification, approval or exemption. See Item 9. Next Page.)

5. Fee is attached (If applicable). $ 1100.00 (No fee required for compost application.)
   (1% x 110,000)
   (Provide explanation of how fee was calculated. Read Requirements Section of Standard Application booklet.)

6. Estimated construction cost of project:

   a. $ 110,000 total cost of the project.

   b. $ 110,000 portion for which this permit is requested.

7. I have included certifications of any public notifications. Yes X No

8. If applicable:
   (For Waterfront Development and Stream Encroachment applications, 8c. must be completed.)

   a. Source of Water Supply

   b. For Treatment at (Water Treatment Plant)

   c. Stream, Waterway, Pond or Lake Arthur Kill

   d. Wastewater Treatment Facility

* *Applicant/Owner must be the individual or municipality, public agency, utility, company, industry who will be the eventual owner and operator of said facility (sewer extension or treatment works) when completed.*

ENDORSEMENTS

SOME PERMIT APPLICATIONS REQUIRE SPECIFIC ENDORSEMENTS OF OWNERS, AGENTS, MUNICIPALITIES, ETC. ENDORSEMENTS MAY BE REQUIRED FOR YOUR PERMIT.

VERIFY THE NEED FOR ENDORSEMENTS IN THE "REQUIREMENTS" SECTION OF THE STANDARD APPLICATION FORM CP #1 BOOKLET OR WITH THE APPROPRIATE DEP AGENCY.

****

A. PROPERTY OWNER'S CERTIFICATION*†

I hereby certify that Exxon Corporation
Property Owner's Name

is the owner of the property upon which the proposed work is to be done. This endorsement is certification that the owner grants permission for the conduct of the proposed activity.

In addition, the aforementioned property owner shall certify:

1. Whether any work is to be done within an easement — Yes ____ *(initial)* No X DWJ *(initial)*
2. Whether any part of the entire project (i.e., pipeline, roadway, cable, transmission line, etc.) will be located within property belonging to the State of New Jersey. Yes ____ *(initial)* No X DWJ *(initial)*

Type or Print Name and Address of Owner, if different from Item 1 on Page 1

Sept 12, 1990
Date

Dwight L Wiggins
Signature of Owner

* Not required for Sewer System Application.
† Required for the Land Application of Sludge, Septage or Compost.

B. APPLICANT'S AGENT

I, the applicant (name) D. L. Wiggins, Manager, Bayway Refinery authorize to act as my agent/representative in all matters pertaining to my application the following person:

Name D. L. Brandon Phone (201) 474-6390

Address P. O. Box 222 County Union

City or Town Linden State New Jersey Zip Code 07036

Occupation/Profession Engineer

Dwight L Wiggins
Signature of Applicant

ANGELA DILEO
Notary Public of New Jersey
My Commission Expires May 30, 1993

AGENT'S CERTIFICATION

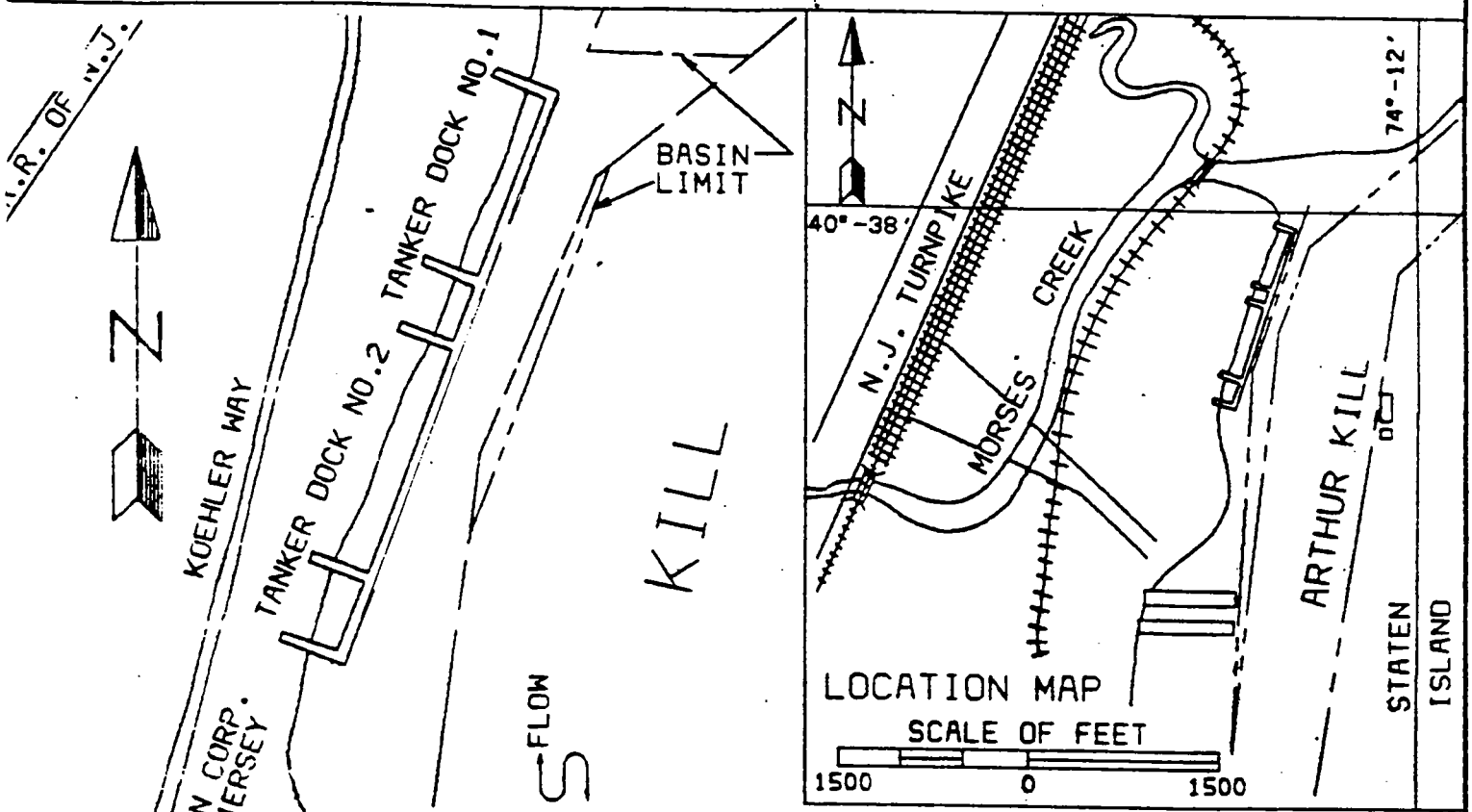
State of Union County

Sworn before me
this 8 day of
AUGUST 19 90

Angela DiLeo
Notary Public

I agree to serve as agent for the above-named applicant

David L. Brandon 8/8/90
Signature of Agent



FROM U.S.C.&G.S. CHART NO. 285

PLAN

SCALE OF FEET

400 0 400

NOTES:

1. SOUNDINGS AND ELEVATIONS ARE IN FEET AND REFER TO MEAN LOW WATER. DATUM - ELEVATION SHOWN - 2.35 = U.S.C. & G.
2. APPROXIMATELY 8400 CU. YDS. TO BE DREDGED AND DISPOSED OF AT SEA, AT A LOCATION DESIGNATED BY U.S. CORPS OF ENGINEERS.
3. AREA TO BE DREDGED SHOWN ▨

PROPOSED DREDGING

IN- - - ARTHUR KILL
AT- - - LINDEN
COUNTY OF UNION
STATE OF N.J.
APPLICATION BY EXXON CORPORATION

Paul J. Lino-Beer
P.E. # 13550
AUG 13 1990
DATE

10 October 1990

CENAN-OP-W

MEMORANDUM FOR: Chief, Regulatory Branch

SUBJECT: Review of Data for Ocean Disposal of Dredged Material, Preapplication by Exxon Company, USA - Bayway Refinery, in the Arthur Kill at Linden, NJ.

1. As requested by your memo dated 25 July 1990, we have evaluated the bioassay testing results submitted by the applicant to determine the material's suitability for ocean disposal at the Mud Dump Site.

2. As indicated in the attached Memo for the Record, results of bioassay/bioaccumulation testing indicate that the proposed dredged material does not meet current ocean disposal testing criteria and cannot, therefore, be disposed at the Mud Dump Site. The solid phase of the proposed dredged material showed toxicity to Nereis virens which was statistically significant and greater than 10%, and thus does not meet the Limiting Permissible Concentration (LPC) for the solid phase.

3. Questions concerning this analysis can be directed to Oksana Yaremko of my staff.

Monte Greges.

MONTE GREGES
Acting Chief, Water
Quality Compliance Branch

Enclosure

10 October 1990

CENAN-OP-W

MEMORANDUM FOR THE RECORD

SUBJECT: Review of Bioassay Test Report (dated 31 Mar 90) for a Preapplication by Exxon Company, USA - Bayway Refinery, Arthur Kill, Linden, NJ

1. An evaluation of the subject test report indicated that the solid phase of the proposed dredged material showed toxicity to Nereis virens which was statistically significant and greater than 10%, and thus does not meet the Limiting Permissible Concentration (LPC) for the solid phase.

2. Since another applicant recently had similar test results (Appl. #90-0666-OD, Independent Cement Co., Flushing Bay) and had used the same testing laboratory, Nytest Environmental Inc. of Port Washington NY, I checked to see whether this could have been due to poor laboratory practice.

3. The two sets of tests were not run at the same time. Exxon's bioassay was started on 19 Feb 90, while Independent Cement's was started on 11 May 90. The problem, thus, does not seem to be confined to one particular batch of bioassays.

4. On 10 Oct 90 I called Remo Gigante at Nytest and asked him whether they had observed anything out of the ordinary when running the Exxon bioassays. He informed me that these bioassays were subcontracted to Aqua Survey of Flemington, NJ. ASI's lab director, Jim Todd, called back and reported that the bioassays went smoothly, and he could not attribute the test results to anything other than the sediment being tested.

Oksana Yaremko
Environmental Engineer
Water Quality
Compliance Branch

ROUTING AND TRANSMITTAL SLIP Date 3 Dec 90

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. C, CENAN-OP-R		
2. Attn G Nieves		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
✓	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
C, CENAN-OP-(J	Phone No. x 5621

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

* U S GPO 1990 — 262-080

28 November 1990

MEMO TO REGULATORY BRANCH

SUBJECT: Preapplication by Exxon USA, Bayways Refinery: Request to retest the solid phase bioassay

1. This concerns the attached letter from the applicant, dated 16 Oct 90, in which the applicant suggests retesting the solid phase bioassay using only the Nereis virens. The reason for doing this was because the original test results showed toxicity of the test organisms which was below the allowable LPC.

2. A quality assurance review of lab notes has not yielded any abnormalities in the data. After reviewing all pertinent information, CENAN-OP-W has concluded that the data is valid and that, therefore, a retest would not be necessary.

3. If the applicant wishes to pursue this further, CENAN-OP-W suggests subdividing the project area into two or three smaller areas, and testing them separately. This would make it possible to identify specific problem areas within the proposed project area, thus eliminating them from further consideration for ocean disposal, while allowing the others to be disposed.

4. The applicant should also be made aware of the fact, that sediment testing shows levels of 2,3,7,8-TCDD above 1 part per trillion (pptr) in sediment from the project area. For this reason, if the area is subdivided and tested, both areas would need to have a 28-day bioaccumulation test for dioxin performed.

5. You may call Oksana Yaremko (x5621) of my staff if you have any questions about this.

Monte Greges

MONTE GREGES
Chief, Water Quality
Compliance Branch

Hoit

EXXON COMPANY, U.S.A.

POST OFFICE BOX 222 • LINDEN, NEW JERSEY 07036-0222

RECEIVED
CORPS OF ENGINEERS
NEW YORK DISTRICT

OCT 17 12 30 PM '90

October 16, 1990

REFINING DEPARTMENT
BAYWAY REFINERY

Renewal of Maintenance Dredging Permit for "A" and "B" Barge Piers at the Bayway Refinery - Proposal To Resolve Concern For Bioassay

Department of the Army
Operations Division
New York District, Corps of Engineers
26 Federal Plaza
New York, New York 10278-0090

ATTN: Mr. Joseph Seebode - Chief, Regulatory Branch

Dear Mr. Seebode:

Exxon Company, U.S.A.'s Bayway Refinery has been working with the New York District Army Corps of Engineers to renew the dredging permit for our "A" and "B" Barge Piers. Ocean disposal of the dredge spoils has been requested. Through communication with the District Engineer, Mr. George Nieves, we have learned that while in the process of reviewing bioassay, bioaccumulation, and bulk sediment test results for samples taken from the proposed dredge site, the Corps' Water Quality Branch expressed concern about a somewhat elevated mortality rate of Nereis Virens during the ten-day Solid Phase Bioassay.

Review of the bioaccumulation analysis results for this species, along with the results of the elutriate and bulk sediment testing have not given the Corps or Exxon an explanation for the mortality rate among the Nereis Virens. It does not appear that exposure to the test sediment caused the organisms to die since no detectable difference in tissue concentration for the contaminants tested exists between control and test organisms. The laboratory is not required to perform standard toxicant testing on organisms used for Solid Phase Bioassays, and no Reference Toxicity Data exists for the Nereis Virens. Without such data, we are unsure of the initial health of the test organisms. Poor health could have influenced the survival rate.

To resolve this concern, we propose to submit samples from the original sample sites to the same laboratory for 10-day Solid Phase Bioassay testing only using the Nereis Virens.

Your prompt response to this proposal is requested so that we may proceed with the steps necessary to complete the permit acquisition process.

Please contact S. C. Brown at (201) 474-6390, or D. L. Brandon at (201) 474-6022, should you require additional information.

Very truly yours,

S. C. Brown
Senior Staff Engineer

DLB/vob

PAULUS
SOKOLOWSKI
and SARTOR, INC.
CONSULTING ENGINEERS

67A MOUNTAIN BOULEVARD EXTENSION
P.O. BOX 4039 • WARREN, NEW JERSEY 07059-0039
(908) 560-9700 • FAX (908) 560-9768

PRINCIPALS
William Paulus, Jr., P.E.
Anthony J. Sartor, Ph.D., P.E., P.P.
O. von Bradsky, P.E.
Philip A. Falcone, P.E.

David R. Antes, P.E.
Michael J. Dillon, P.P., P.E.
Michael M. Gennaro, P.E.
Marilyn Lennon, P.P.
James R. Mehltretter, P.E.
Carroll J. Oliva, P.E., R.A.
Frank P. Vultaggio, P.E.

SENIOR ASSOCIATES
Michael P. Cohen, P.E.
Joseph J. Fleming, P.E.
Leonard C. Grayson, Ph.D., P.E.
Bruce T. Hawkins, C.L.A.
Todd R. Heacock, P.E.
S. Louis Kelter, P.E.
Joseph J. Lifrieri, P.E.
Emad Youssef, P.E.

ASSOCIATES
Joseph P. Barry, P.E.
William J. Berk, P.G.
John Bolan, P.E.
Walter W. Burke, P.E.
Elpidio C. Carbonell, P.E.
Jon D. Engle, P.E.
Mark Lennon
Elizabeth S. McLoughlin, P.P.
Theodore J. Mezzacapo, P.P., P.E.
P. Steve Oliver
Eric Simone, P.E.
David W. Smith
Janos Szeman
Mark C. von Bradsky, P.E.
Francis Wecht, L.S.

October 29, 1991
1517-0001-24

FEDERAL EXPRESS

Mr. George Nieves, Chief
Western Permits Section
Regulatory Branch
U.S. Army Corps of Engineers
26 Federal Plaza
New York, New York 10278-0090

RE: Sampling Scheme Request for Barge Piers A and B
Exxon Bayway Refinery
Linden, Union County, New Jersey

Dear Mr. Nieves:

On behalf of Exxon Company, U.S.A. (Exxon), Paulus, Sokolowski and Sartor, Inc. (PS&S) is requesting three separate sampling schemes for Barge Piers A and B at the Exxon Bayway Refinery located on the Arthur Kill in Linden, Union County, New Jersey. The sampling schemes are being requested to restore navigable depths for areas that have been historically dredged with ocean disposal. This proposed maintenance dredging activity is totally independent of other proposed redevelopment activities at the Exxon Bayway Refinery.

Enclosed for your review and information are the following:

a. Vicinity Map showing the project location;
b. Location Plan depicting the existing project area;
c. Three copies of a bathymetric survey dated October 9, 1991;
d. Ocean disposal information sheet; and
e. Recent history of spills in the area.

Exxon has not dredged at Barge Piers A and B since the mid 1980's. Similar facilities in the Arthur Kill usually require dredging every two years to maintain navigable depths. Due to current silting conditions, the depths at the Barge Piers are inadequate for a fully loaded barge to dock. The barges are now loaded to only about half their capacity which has resulted in an increase in barge traffic leaving and entering the Bayway facility. Without this increase in barge

traffic Exxon would not be able to meet their production requirements. In addition to the increase in barge traffic on the Arthur Kill, there are increased numbers of transfers of oil to the barges from the large tankers located in Raritan Bay.

Based on the enclosed bathymetric survey, Exxon estimates that approximately 3,100 cubic yards of material would be dredged initially in Area 1, 6,000 cubic yards in Area 2 and 2,300 cubic yards in Area 3 for a total of approximately 11,400 cubic yards of dredged material to be removed within the proximity of Barge Piers A and B to obtain a navigable depth of 25 feet below mean low water. Exxon will utilize a clamshell bucket and barge scow for the proposed dredging activities. The proposed depths are required to restore full navigability and to continue safe loading and unloading operations at the Exxon Bayway Refinery waterfront.

Exxon has determined that there are three separate and distinct areas at Barge Piers A and B that require dredging at this time. The three proposed dredge areas are not dependent upon each other and all three areas can be dredged independently of each other without affecting the other areas. As indicated on the enclosed drawing depicting the proposed dredge areas at Barge Piers A and B, Areas 1, 2 and 3 have been previously dredged, with the last time being approximately five years ago under Department of the Army Permit No. 12883. The New Jersey Department of Environmental Protection and Energy issued Waterfront Development Permit No. 2009-90-0003.2 on February 14, 1991 for the proposed Barge Pier A and B dredging.

Exxon is aware that the new Federal criteria for disposal of dredged material in the Atlantic Ocean has not been established as of the date of this request. The ACOE has also indicated to PS&S that they will not approve of a sampling scheme without attaching the appropriate criteria to be tested. Due to severe time constraints and existing operational difficulties, a sampling scheme is requested as soon as the criteria is established so that Exxon can proceed with the required sampling as soon as possible.

As a result of this, Exxon is requesting that three distinct, independent sampling schemes be designated by the ACOE so that each area can be tested independently of the other areas. Although this will result in a more costly sampling protocol, if one of the three dredge areas contains material that is unacceptable for ocean disposal and the other areas do not, by not compositing this material with the other proposed dredge areas, the unacceptable dredge area will not impose dredging restrictions on the other areas. This initial identification to isolate any unacceptable dredge materials would allow Exxon to proceed through the ACOE permitting process for the other areas deemed suitable for ocean disposal of dredged material without having to wait for additional sampling and testing to try to isolate the unacceptable areas.

This request for three separate sampling schemes within one project area is being made in order to expedite the evaluation and approval process. Testing can take six to eight weeks,

not including the time required for scheduling and mobilization of the lab to take the required core samples. If one unacceptable sample contaminates an entire composite, additional testing would be needed to isolate the unacceptable area. Exxon would like to avoid this potential time delay.

Due to extensive on-site oil and chemical processing facilities located at the site, Exxon does not have the capability to dispose of the dredged material at an upland location at their facility, as demonstrated in past ocean disposal permit applications on which the ACOE has concurred. Exxon, in conjunction with PS&S, will submit a detailed alternatives analysis to ocean disposal of the dredged material as part of the formal permit application.

A favorable review and approval of the sampling scheme is requested so that the application process can move forward in a timely fashion to meet Exxon's anticipated Spring 1992 dredging schedule. If you have any questions concerning this correspondence please do not hesitate to contact us.

Very truly yours,

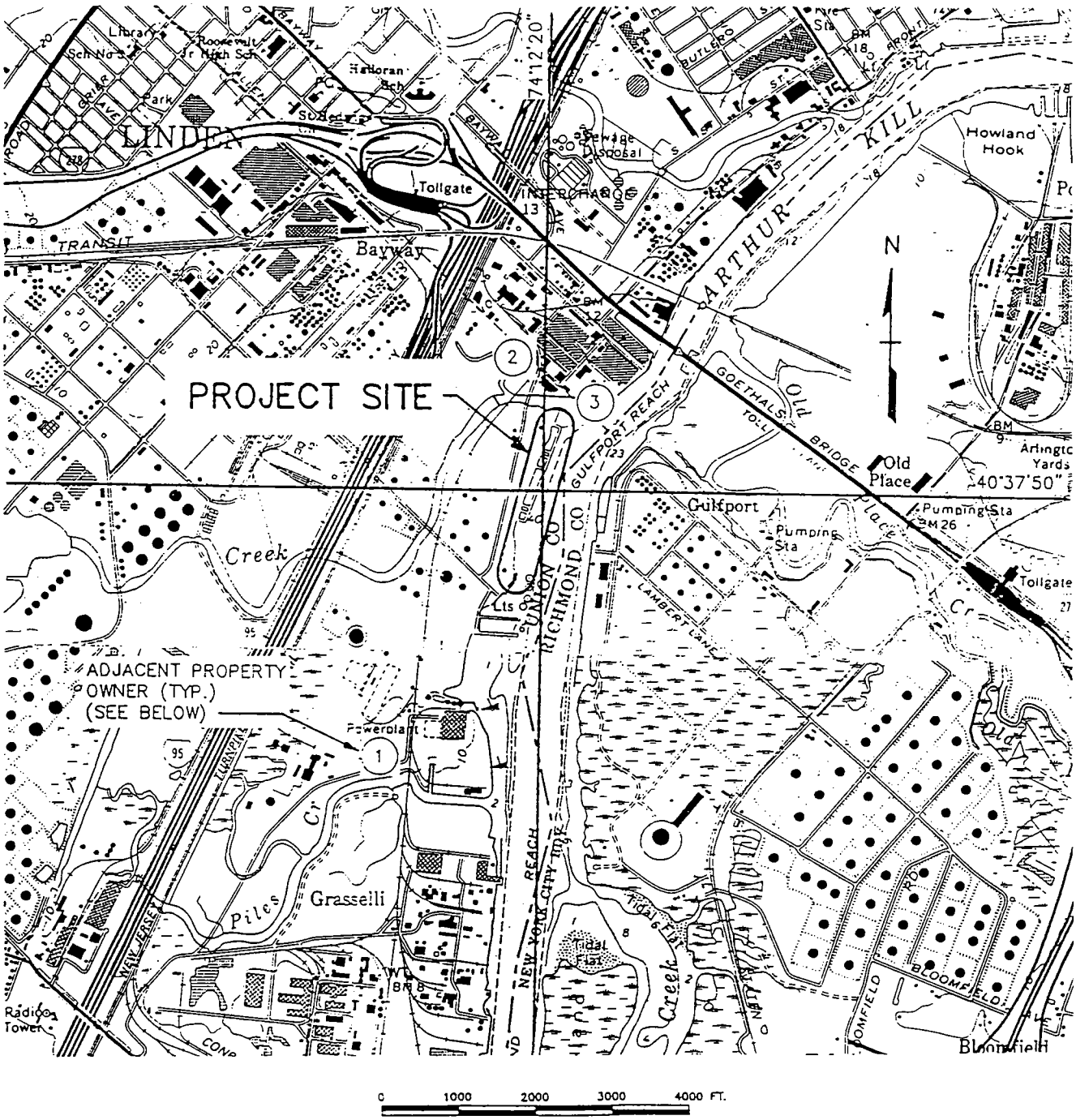
PAULUS, SOKOLOWSKI AND SARTOR, INC.

Ingro Desvousges
Project Manager

David Charette
Senior Project Manager

IPD/law
Enclosures

cc: Tom Accetta, Exxon
Kim Ie, Exxon
Brad Miller, Exxon
Monte Greges, ACOE
Mark Roth, ACOE
Steve Oliver, PS&S



SOURCE: USGS ELIZABETH, NJ QUADRANGLE MAP

PREPARED BY HAN-PADRON ASSOCIATES

PURPOSE: MAINTENANCE DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:

1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

VICINITY MAP

EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY
MARINE PROJECTS

IN: ARTHUR KILL

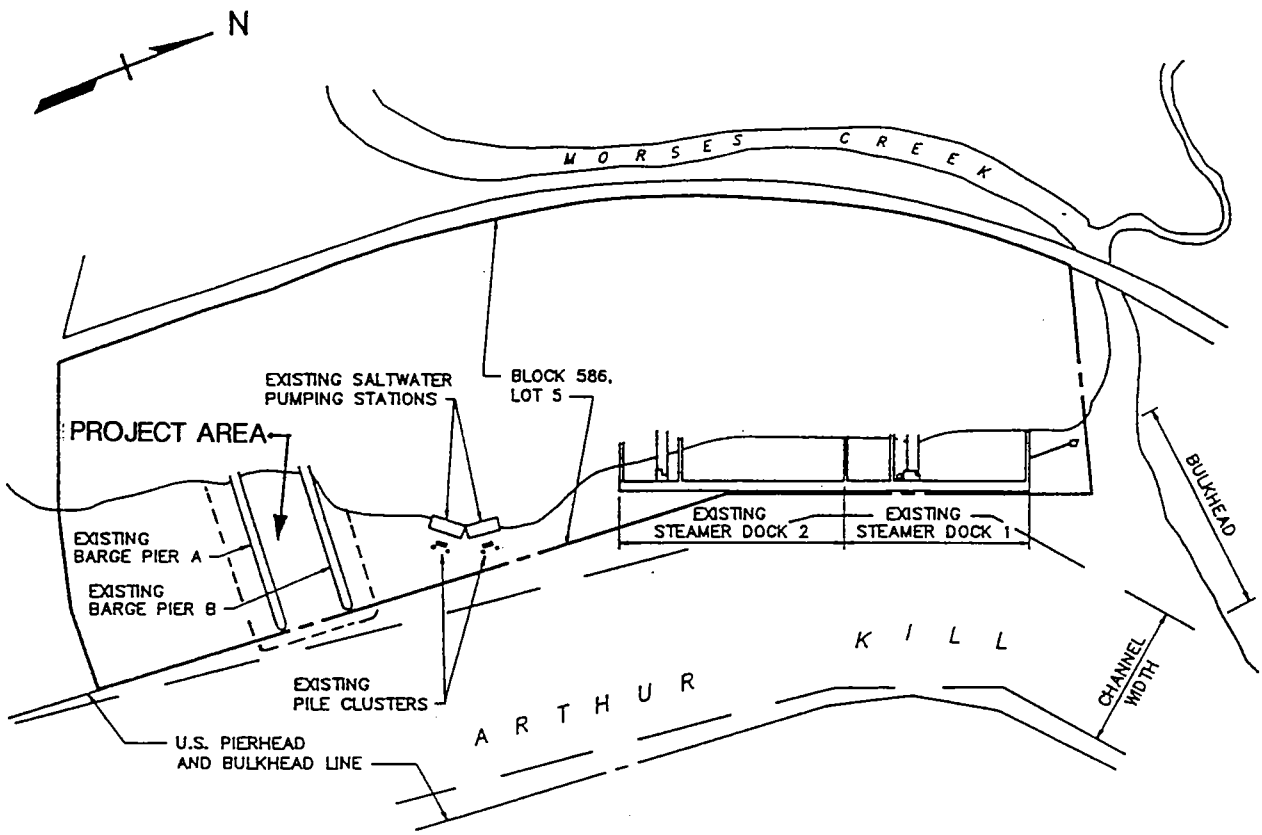
AT: EXXON BAYWAY REFINERY

COUNTY OF: UNION STATE: NJ

APPLICATION BY: EXXON CO., U.S.A.

SHEET 1 OF 2 DATE 8/14/91

402-01\FIG\FIG-1 (1)



0 200 400 600 800 1000 FT.

PREPARED BY HAN-PADRON ASSOCIATES

PURPOSE: **MAINTENANCE DREDGING**

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:

1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

LOCATION PLAN

EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY
MARINE PROJECTS

IN: ARTHUR KILL

AT: EXXON BAYWAY REFINERY

COUNTY OF: UNION STATE: NJ

APPLICATION BY: EXXON CO., U.S.A.

SHEET 2 OF 2 DATE 8/14/91

402-01\FIG\FIG-2C (600)

OCEAN DISPOSAL INFORMATION SHEET

PLEASE COMPLETE THIS FORM AND RETURN IT TO THIS OFFICE

APPLICANT/APPLICATION NUMBER: Exxon Company, U.S.A.
1400 Park Avenue
Linden, New Jersey 07036

LOCATION OF WORK/WATERWAY: Exxon Bayway Refinery/Arthur Kill

***PROPOSED ACTIVITY* (INDICATE IF THERE WILL BE BARGE OVERFLOW):**

Maintenance dredge at Exxon's Barge Piers A and B with ocean disposal of the dredged material at the Mud Dump site. A clamshell bucket and barge scow will be used to perform the dredging activities. There will be no barge overflow.

VOLUME OF MATERIAL PROPOSED TO BE DREDGED: Approximately 11,400 cubic yards.

VOLUME OF MATERIAL TO BE DISPOSED OF AT THE MUD DUMP SITE: Approximately 11,400 cubic yards.

PROPOSED DREDGING DEPTH: 25 feet below mean low water.

AREA TO BE DREDGED (SQUARE FEET): Approximately 92,000 square feet.

LOCATION OF OUTFALLS, IF ANY: None

LIST OF ANY SPILLS IN VICINITY OF PROJECT AREA: See attached sheet.

***METHOD OF PROPOSED DREDGING* (CLAMSHELL BUCKET, HYDRAULIC, ETC.):**

Clamshell bucket and barge scow.

***HISTORY* (PLEASE LIST PAST CORPS PERMIT NUMBERS WITH DATE OF ISSUANCE AND DATE THE PROJECT AREA WAS LAST DREDGED):**

Department of the Army Permit No. 12883 was issued on May 5, 1983. The area was last dredged in June 1985 to a depth of 25 feet below mean low water. The dredged material was disposed of at the Mud Dump site.

gn/6-89

SPILLS IN VICINITY OF EXXON BAYWAY REFINERY WATERFRONT

DATE	MATERIAL SPILLED	QUANTITY SPILLED	DESCRIPTION
09/29/91	Diesel	8 gal	Deck spill of pump diesel fuel washed overboard by barge deckman. Spill was cleaned.
08/30/91	Bunker C	25 gal	Release discovered within boom in loading operation, as well as in the Kill. Source of oil never determined although vessel suspected. Spill was cleaned.
06/20/91	Lube Oil	0.25 gal	Heat exchanged leak in ship cooling water system. Spill was cleaned.
05/22/91	Slop Oil	0.25 gal	Flange leak due to thermal pressure in line blocked-in for maintenance. Spill was cleaned.
05/19/91	Heartcut Reformate	3 gal	Pinhole leak in hull seam. Spill was cleaned.
05/03/91	Slop Oil	2 gal	Leak during flood test of S/D 2 through open electrical conduit. Spill was cleaned.
04/24/91	Slop Oil	1 gal	Pinhole pipeline leak in S/D 1 slop oil line which was disturbed during maintenance inspection activities. Spill was cleaned.
03/24/91	Heating Oil	<1 gal	Small leak through stress crack in barge hull. Spill was cleaned.
03/13/91	RSFO	3 gal	Sump overflowed N/B and leaked through cracks in dock deck. Spill was cleaned.
12/15/90	Heating Oil	~1 pt	Seepage through loose drain plug on drip pan. Spill was cleaned.
12/09/90	Crude	<1 gal	Leaking ships valve on bilge line. Spill was cleaned.
12/02/90	PGO	42 gal	Improper alignment of hose flange within manifold "Cam-lock" filling. Spill was cleaned.
11/08/90	Arab Heavy	10 bbl	Discharge from vessel's dirty ballast system while preparing to leave berth. Spill was cleaned.
09/18/90	Diesel Oil	~1 gal	Small leak thru stress crack in bottom shell plating. Spill was cleaned.
08/28/90	Hydraulic Fluid	1-2 gal	1" hydraulic hose burst on barge while adjusting cargo transfer hose. Spill was cleaned.
08/27/90	Gasoline	1 gal	Overfilled tank due to stripping value leakage. Spill was cleaned.
07/29/90	Oily Water	~200 gal	Bilge tanks overflowed due to barge cooling water hose failure while at Steamer Dock 2. Spilled was cleaned.
07/18/90	Heating Oil	875 bbl	Oil spilled during Vessel collision while leaving docks. Spill was cleaned.
03/01/90	N/A	114 bbl	Leak at #1 Tanker Dock-loading arm coupling. Spill was cleaned.

DATE	MATERIAL SPILLED	QUANTITY SPILLED	DESCRIPTION
01/25/90	Oil	2 gal	Vessel spilled oil onto water. Spill was cleaned.
01/02/90	Heating Oil	567,000 gal	Pipeline leak. Spill was cleaned.
12/13/89	Heating Oil	5 gal	Vessel spilled oil. Spill was cleaned.
09/03/90	Diesel	10 gal	Vessel spilled oil. Spill was cleaned.
07/05/89	Slop Oil	5 gal	Sump overfill during rain storm. Spill was cleaned.
06/15/89	Mogas	5 gal	Vessel spilled oil. Spilled was cleaned.
06/14/89	Crude Oil	10 gal	Vessel overfilled onboard slop tank. Spill was cleaned.
06/10/89	Gasoline	1 qt	A pressure gauge failure at A pier. Spill was cleaned.
06/06/89	Gasoline	3 gal	Vessel spilled oil. Spill was cleaned.
04/07/89	PGO	1 qt	Vessel spilled oil. Spill was cleaned.
12/01/88	Gasoline	50 gal	Vessel overfilling compartment. Spill was cleaned.
08/03/88	Crude	2 bbl	Tanker dock arm failure. Spill was cleaned.
08/25/88	Jet fuel	30 gal	Barge compartment leak. Spill was cleaned.
08/02/88	Gasoline	25 gal	Vessel overfilled compartment. Spill was cleaned.
12/29/88	Oil	3 bbl	Chartered vessel spilled oil. Oil was cleaned.
06/18/88	Slop Oil	30 gal	Overflow of pier sump spilled oil onto water. Spill was cleaned.
07/02/87	Asphalt-unknown source	1 bbl	Not an EXXON spill, oil floated in with tide. Area cleaned by EXXON.
06/02/87	No 2 fuel oil	2 qts	A pressure gauge failure at Pier A sprayed oil onto water. Sheen was cleaned up.
03/17/87	Diesel	1 gal	Failure of a relief valve connection sprayed oil. Sheen was cleaned up.
09/25/86	Asphalt-unknown source	1 bbl	Fugitive spill, no sources found on Piers. Oil was cleaned up.
12/17/85	Asphalt	40 gal	Onshore pipeline failure leaked oil to waterline. Oil was cleaned up.

CENAN-OP-W 3 December 1991

MEMORANDUM FOR C, CENAN-OP-R

SUBJECT Sampling/testing scheme for Exxon Company, USA Bayway Refinery, Arthur Kill, New Jersey.

1. As requested in a letter from the applicant, dated 29 October 1991, a sediment sampling scheme and list of required testing for the above proposed dredging project are enclosed.

2. The sampling scheme (see attached map), listing a total of ten (10) sampling locations, has been provided for the new permit application for the proposed project based on sounding surveys performed in October 1991. As requested by the applicant CENAN-OP-W has divided the Barge Piers "A" & "B" into three separate and distinct areas, independent and apart from each other. Individual area volumes are given on the enclosed map.

3. Combined, a total volume of 11,400 cubic yards will be dredged by clamshell bucket dredge to a depth of -25 ft. MLW. Should conditions at the site change due to deposition or erosion, the applicant must notify us prior to collecting any samples. Samples must be collected no deeper than project depth plus 2 ft. allowable overdraft.

4. The testing scheme is based on the location of the project site within the upper reaches of the Arthur Kill. You will note that bulk sediment testing of each composite core for dioxin (2,3,7,8-TCDD) is being required. If dioxin is detected, at a 1 part per trillion detection level, 28-day bioaccumulation testing will be required. The applicant is to notify the NY District upon completion of the bulk chemical analysis in order to confirm the need for bioaccumulation testing.

5. The applicant must inform CENAN-OP-W as to which analytical laboratory will be performing the sample analysis prior to initiation of testing so that we can verify that the facility has been inspected by the NY District and is qualified to do the required testing.

6. Questions regarding our determination can be directed to Brian May of my staff at X5621.

for Monte P. Greges, Chief,
Water Quality
Compliance Branch

Enclosures:

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

Regulatory Branch

SUBJECT: Amended Sampling scheme and required testing for Ocean Disposal of Dredged Sediment at the Mud Dump, by EXXON, Company USA, from their Bayway Refinery facility in the Arthur Kill, Union County, New Jersey

Mr. D. L. Brandon
EXXON, Company, USA
P. O. Box 222
Linden, New Jersey 07038-0222

Dear Mr. Brandon:

Enclosed please find an amended sediment sampling scheme for the required testing for the subject pre-application. This scheme divides the previously tested areas into three smaller areas and is is based on the October, 1991 soundings, a project depth of -25 feet (+ 2 feet of allowable overdredge) below the plane of Mean Low Water, and an assumed total volume of approximately 11,400 cubic yards of material. If site conditions have changed or these assumptions are incorrect, you are required to contact us prior to sampling.

The proposed dredge area requires the taking of ten samples. The sampling, to be done by core, is required to be to project depth plus two feet. The locations of the required samples are on the attached sheets. Chemical bulk sediment testing of a **composite of each individual** core for dioxin is being required. If dioxin is detected at a 1 part per trillion concentration level, 28 day bioaccumulation testing will be required. Therefore, the applicant must notify the New York District upon completion of the bulk chemical analysis in order to confirm the need for the additional testing. All biologic tests (the 10 and 28 day ones) will be done on a composite sample of the cores from **each area.**

- To insure that the laboratory you select to perform this testing is a USEPA approved laboratory for 2,3,7,8-TCDD (Dioxin) and ocean disposal testing, it is recommended that you contact Ms. Oksana Yaremko at (212) 264-5621 or the undersigned at telephone number (212) 264-0184 for confirmation.

Sincerely,

MSR

Mark Steven Roth
Ocean Disposal Project Manager,
Western Permits Section

REQUIRED TESTING
For
Ocean Disposal of Dredged Material

Applicant EXXON COMPANY, USA Appl.No. PRE-APPLICATION

Address BAYWAY REFINERY, BARGE PIERS "A" & "B" AREA "3"

Waterway ARTHUR KILL LINDEN NEW JERSEY

Proposed Volume: 2,288 cu.yds.

No meeting was held at NYD offices in New York.

The sampling and testing scheme described below was approved for the proposed project area based upon the information contained in the attached map.

Testing will be performed by the following labs:
Biological: ? Analytical: ?

SAMPLING SCHEME

3 sample sites, as indicated on attached map (cores to project depth) with 2 ft. allowable overdraft

REQUIRED TESTING

1. GRAIN SIZE ANALYSIS
(% sand, % silt, % clay)
   a. X Test sediment from each sample site
   (NOTE: If stratification is observed, each layer within a core must be analyzed separately)
   b. X Reference sediment
   c. X Control sediment

2. BULK SEDIMENT ANALYSIS
(NOTE: On test sediment from each sample site)
   a. X Copper
   b. X Nickel
   c. X Zinc
   d. X % Total Organic Carbon
   e. X % Moisture
   f. X DIOXIN (2,3,7,8-TCDD) Detection level= 1 ng/kg (1 part per trillion)

3. BIOASSAYS
   a. X Suspended Particulate Phase (A.tonsa, M.bahia, M.menidia) *(See attached Scope of Work)
   b. X Standard Toxicant Analysis (A.tonsa, M.bahia, M.menidia)
   c. X 10-Day Solid Phase (P.pugio, M.mercenaria, N.virens)

4. BIOACCUMULATION ANALYSIS
   a. X Petroleum hydrocarbons
   b. X PCBs
   c. X Mercury
   d. X Cadmium
   e. X DDT
   f. X DIOXIN (2,3,7,8-TCDD) May be necessary. Contact the New York District when sediment analysis is complete.

5. CHEMICAL ANALYSIS OF SITE WATER & ELUTRIATE
   a. X Petroleum hydrocarbons
   b. X PCBs
   c. X Mercury
   d. X Cadmium
   e. X DDT
   f. ___

PREPARED BY: Brian May, Oceanographer, CENAN-OP-W

Attachment

REQUIRED TESTING
For
Ocean Disposal of Dredged Material

Applicant EXXON COMPANY, USA Appl.No. PRE-APPLICATION

Address BAYWAY REFINERY BARGE PIERS "A" & "B" AREA "2"

Waterway ARTHUR KILL, LINDEN, NEW JERSEY

Proposed Volume: 5,935 cu.yds.

No meeting was held _____ at NYD offices in New York.

The sampling and testing scheme described below was approved for the proposed project area based upon the information contained in the attached map.

Testing will be performed by the following labs:
Biological: ? Analytical: ?

SAMPLING SCHEME

_4_ sample sites, as indicated on attached map (cores to project depth) with 2 ft. allowable overdraft.

REQUIRED TESTING

1. GRAIN SIZE ANALYSIS
(% sand, % silt, % clay)
   a. X Test sediment from each sample site
   (NOTE: If stratification is observed, each layer within a core must be analyzed separately)
   b. X Reference sediment
   c. X Control sediment

2. BULK SEDIMENT ANALYSIS
(NOTE: On test sediment from each sample site)
   a. X Copper
   b. X Nickel
   c. X Zinc
   d. X % Total Organic Carbon
   e. X % Moisture
   f. X DIOXIN (2,3,7,8-TCDD) Detection level= 1 ng/kg (1 pa rt per trillion)

3. BIOASSAYS
   a. X Suspended Particulate Phase (A.tonsa, M.bahia, M.menidia) * (See attached Scope of Wo
   b. X Standard Toxicant Analysis (A.tonsa, M.bahia, M.menidia)
   c. X 10-Day Solid Phase (P.pugio, M.mercenaria, N.virens)

4. BIOACCUMULATION ANALYSIS
   a. X Petroleum hydrocarbons
   b. X PCBs
   c. X Mercury
   d. X Cadmium
   e. X DDT
   f. X DIOXIN (2,3,7,8-TCDD) May be necessary. Contact the New York District when sediment analysis is complete.

5. CHEMICAL ANALYSIS OF SITE WATER & ELUTRIATE
   a. X Petroleum hydrocarbons
   b. X PCBs
   c. X Mercury
   d. X Cadmium
   e. X DDT
   f. __

PREPARED BY: Brian May, Oceanographer, CENAN-OP-W

REQUIRED TESTING
For
Ocean Disposal of Dredged Material

Applicant EXXON COMPANY, USA Appl.No. PRE-APPLICATION

Address BAYWAY REFINERY BARGE PIERS "A" & "B" AREA "1"

Waterway ARTHUR KILL, LINDEN, NEW JERSEY

Proposed Volume: 3,095 cu.yds.

no meeting was held at NYD offices in New York.

The sampling and testing scheme described below was approved for the proposed project area based upon the information contained in the attached map.

Testing will be performed by the following labs:
Biological: ? Analytical: ?

SAMPLING SCHEME

3 sample sites, as indicated on attached map (cores to project depth) with 2 ft. allowable overdraft.

REQUIRED TESTING

1. GRAIN SIZE ANALYSIS
(% sand, % silt, % clay)
   a. X Test sediment from each sample site
      (NOTE: If stratification is observed, each layer within a core must be analyzed separately)
   b. X Reference sediment
   c. X Control sediment

2. BULK SEDIMENT ANALYSIS
(NOTE: On test sediment from each sample site)
   a. X Copper
   b. X Nickel
   c. X Zinc
   d. X % Total Organic Carbon
   e. X % Moisture
   f. X DIOXIN (2,3,7,8-TCDD) Detection level= 1 ng/kg (1 part per trillion)

3. BIOASSAYS
   a. X Suspended Particulate Phase (A.tonsa, M.bahia, M.menidia)
   b. X Standard Toxicant Analysis (A.tonsa, M.bahia, M.menidia)
   c. X 10-Day Solid Phase (P.pugio, M.mercenaria, N.virens)

(See attached Scope of Work)

4. BIOACCUMULATION ANALYSIS
   a. X Petroleum hydrocarbons
   b. X PCBs
   c. X Mercury
   d. X Cadmium
   e. X DDT
   f. X DIOXIN (2,3,7,8-TCDD)

May be necessary. Contact the New York District when sediment analysis is complete.

5. CHEMICAL ANALYSIS OF SITE WATER & ELUTRIATE
   a. X Petroleum hydrocarbons
   b. X PCBs
   c. X Mercury
   d. X Cadmium
   e. X DDT
   f.

PREPARED BY: Brian May, Oceanographer CENAN-OP-W

Attachment

*

SCOPE OF WORK

SAMPLING & TESTING
FOR
PROJECTS WHICH REQUIRE 2,3,7,8-TCDD TESTING

1. Cores must be collected to project depth plus two feet and composited into one sample per station.

2. All composite core samples must be analyzed for 2,3,7,8-TCDD to 1 part per trillion (pptr). Samples must also be analyzed for total organic carbon, percent moisture and grain size.

3. If 2,3,7,8-TCDD is detected at 1 pptr in any single sample, the whole reach must undergo solid phase bioaccumulation testing for 2,3,7,8-TCDD using the polychaete Nereis virens. This is in addition to the 10-day solid phase bioassays and is identical to them except for the following:

   a. Instead of layering test sediment over reference sediment as is currently done, the laboratory is to use whole test sediment alone in the test aquaria, reference sediment alone in the reference aquaria and control sediment alone in the control aquaria.

   b. The polychaetes are to be held in tanks for 28 days, as opposed to the currently required 10 days. At the end of this time, they are to be purged in clean water for 24 hours, and the tissue is to be analyzed for 2,3,7,8-TCDD to a detection level of 1 pptr (wet weight).

4. Five replicates of the sediment composite (i.e, test sediment) for each reach are to be tested. A minimum of 20 organisms per replicate are to be used in order to ensure adequate tissue amounts for the required detection levels. Each replicate must be analyzed separately for 2,3,7,8-TCDD to a detection level of 1 pptr (wet weight).

5. Five replicates of reference sediment, with a minimum of 20 organisms per replicate, are to be tested as well. Each replicate of reference organisms must also be analyzed for 2,3,7,8-TCDD to a detection level of 1 pptr (wet weight).

6. Three replicates of control sediment, with a minimum of 20 organisms per replicate, must be tested. Organisms tested in the control sediment need not be analyzed; however, they must be frozen and stored for possible future testing.

7. As with 10-day solid phase bioassays, organisms being used for the 28-day bioaccumulation must be tested for 2,3,7,8-TCDD prior to initiation of the test (i.e., "Pretest tissue analysis"). Three aliquots, with a minimum of 20 organisms per aliquot, are to be analyzed. Should 2,3,7,8-TCDD be detected in any one of these aliquots (at 1 pptr detection level), the organism batch must be discarded and substituted with a new one. Data from these analyses are to be submitted to New York District as part of the testing report.

8. The laboratory doing the analytical work must be approved by EPA for performing these analyses to the required detection limit of 1 pptr.

9. The 2,3,7,8-TCDD sediment data must be submitted to the New York District, Corps of Engineers immediately upon receipt from the laboratory, along with a copy of the sampling log. Upon submission of the sediment data for dioxin, a sampling scheme will be determined by the Corps.

12/4/91

CENAN-OP-R

JUL 2 5 1990

MEMORANDUM FOR: Chief, Water Quality Compliance Branch

SUBJECT: Request for Data Review and Analysis for a Pre-Application by the Exxon Company, U. S. A., at the Bayway Refinery, in the Arthur Kill, at Linden, Union County, New Jersey

1. We are requesting the following:

XXXX a. Analysis of the attached testing which has been submitted as part of the above application. Please indicate the completeness of the testing package and whether the proposed dredged material satisfies the Ocean Dumping Criteria.

XXXX b. Evaluation of the environmental significance of the mixing zone from the intentional barge overflow at the dredging site. This will be used in an evaluation of the proposed activity in accordance with the guidelines promulgated under Section 404(b)(1) of the Clean Water Act of 1972.

____ c. The presence of a Water Quality Compliance Section representative at a pre-application meeting with

_____

_____

_____.

____ d. A sampling scheme and checklist of required testing for the subject project as further described in the attached information.

____ e. Review of the attached draft public notice for completeness and accuracy.

____ f. Other.

2. It is requested that you respond within fourteen (14) working days to allow our expeditious processing of this application.

JOSEPH J. SEEBODE
Chief, Regulatory Branch

Attachments

NIEVES

TOMER

SEEBODE

EXXON COMPANY, U.S.A.
POST OFFICE BOX 222 • LINDEN, NEW JERSEY 07036-0222

REFINING DEPARTMENT
BAYWAY REFINERY

July 17, 1990

Maintenance Dredging at Barge Piers

Department of The Army
Operations Division
New York District, Corps of Engineers
26 Federal Plaza
New York, New York 10278-0090

ATTN: Mr. George Nieves
Project Manager, Ocean Disposal
Western Permits Section

Dear Sir:

Pursuant to your request, included herein are two copies of results from biological assays and analytical tests performed on samples of material to be dredged from Exxon Company, U.S.A., Bayway Refinery barge piers and disposed of in ocean waters.

Please call me at (201) 474-6390 if you have questions or require additional information.

Very truly yours,

D. L. Brandon

D. L. Brandon
Senior Engineer

DLB/vob

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT
nytest environmental inc.

May 29, 1990

Exxon USA
1400 Park Avenue
Linden, N.J. 07036

Attention: R.A. Greaux
Subject : NEI Project No. 90-16673
Login #3871
Bioassay/Bioaccumulation Report - Bowery Bay

Dear Mr. Greaux:

With reference to the subject matter, enclosed please find a revision to our report, Pages 8, 33, 34, 35, and 35A (3 copies each).

Earlier this year, a computer program was written to perform grain size calculations. We have discovered an error in this program and accordingly have issued a revision of these pages.

Please discard the Grain Size Analysis pages and correlating appendix pages in the raw data section of the original report and substitute the enclosed corrected pages.

I am sorry for any inconvenience this may have caused.

Regards,

Nytest Environmental Inc.

Remo Gigante
Exec. VP

RG:gd
Encs.

box 1518 □ 60 seaview blvd., port washington, ny 11050 □ (516) 625-5500

B. Physical Testing

Test sediment samples were cored from 12 project areas. Grain size and water content determinations were made for each test sediment, composite from the twelve test sediments, reference and control sediment. Grain size distribution is defined by the following criteria:

Sand > 0 = to 0.0625 mm
Silt < 0.0625 but > 0.0039 mm
Clay < 0.0039 mm

Table 2. Results of Grain Size and Percent Moisture.

Sample ID	% Sand	% Silt	% Clay	% Moisture
Core 1	49.60	34.78	15.63	70.13
Core 2	56.51	29.38	14.10	66.45
Core 3	53.43	33.32	13.25	67.65
Core 4	74.91	15.29	9.80	63.43
Core 5	66.00	21.24	12.76	64.45
Core 6	61.50	21.31	17.19	63.85
Core 7	68.44	18.16	13.40	70.60
Core 8	54.42	30.83	14.75	65.99
Core 9	61.37	24.77	13.86	68.18
Core 10	49.64	33.95	16.41	64.91
Core 11	81.05	12.79	6.17	58.34
Core 12	49.58	37.35	13.09	70.13
Composite	63.71	20.99	15.30	71.17
Control	70.46	18.06	11.48	20.89
Reference	98.81	0.17	1.02	47.8

Grain Size Analysis

Core #	Y Intercept	Slope	% Sand	% Silt	% Clay
1	11.75	994.46	49.60	34.78	15.63
2	10.72	867.30	56.51	29.38	14.10
3	9.74	900.95	53.43	33.32	13.25
4	7.75	527.49	74.91	15.29	9.80
5	10.01	704.14	66.00	21.24	12.76
6	13.92	838.70	61.50	21.31	17.19
7	10.76	677.07	68.44	18.16	13.40
8	11.21	908.63	54.42	30.83	14.75
9	10.78	790.54	61.37	24.77	13.86
10	12.49	1005.57	49.64	33.95	16.41
11	4.69	378.27	81.05	12.79	6.17
12	9.36	956.84	49.58	37.35	13.09
Composite	12.27	776.97	63.71	20.99	15.30
Control	9.07	617.73	70.46	18.06	11.48
Reference	0.89	33.27	98.81	0.17	1.02

$y = m.\ lm\ (x) + b$

From the above data the % Clay, % Sand, and % Silt was generated by computer using the "numerical method for line best fitting data".

Date: 2/14/90 Site: [illegible]

Sample # 1 Grams used: 50 f_M 0.949

K = 0.01348

Clock Time	T	R h	L	Z	GS mm.
1200	2	24.5	12.4	41.10	0.0336
1203	5	22.0	12.7	35.83	0.0245
1213	15	20.0	13.0	31.61	0.0125
1228	30	15.0	13.8	21.07	0.0091
1258	60	13.5	14.1	17.91	0.0065
408	250	10.5	14.6	11.59	0.0033
11.58	1440	10.0	14.7	10.54	0.0014

Sample # 2 Grams used: 50 f_M 0.954

Clock Time	T	R h	L	Z	GS mm.
1203	2	23.0	12.5	37.74	0.0337
1206	5	19.5	13.1	30.40	0.0218
1216	15	17.5	13.4	26.21	0.0127
1231	30	14.5	13.9	19.92	0.0092
101	60	13.0	14.2	16.77	0.0066
411	250	10.0	14.7	10.48	0.0033
1201	1440	10.0	14.7	10.48	0.0014

Sample # 3 Grams used: 50 f_M 0.945

Clock Time	T	R h	L	Z	GS mm.
1206	2	22.5	12.6	37.04	0.0338
1209	5	20.0	13.0	31.75	0.0217
1219	15	17.0	13.5	25.40	0.0128
1234	30	14.0	14.0	19.05	0.0092
104	60	12.5	14.25	15.87	0.0066
414	250	10.0	14.7	10.58	0.0033
1204	1440	9.0	14.8	8.47	0.0014

Sample # 4 Grams used: 50 f_M 0.936

Clock Time	T	R h	L	Z	GS mm.
1212	2	16.0	13.7	23.50	0.0353
1215	5	15.5	13.75	22.44	0.0224
1225	15	13.5	14.1	18.16	0.0131
1240	30	11.0	14.5	12.82	0.0094
110	60	10.0	14.7	10.68	0.0067
420	250	9.0	14.8	9.55	0.0033
1210	1440	8.0	15.0	6.41	0.0014

Sample # 5 Grams used: 50 f_M 0.937

Clock Time	T	R h	L	Z	GS mm.
1219	2	20.5	12.95	33.08	0.0343
1220	5	17.6	13.5	25.61	0.0221
1230	15	15.5	13.75	22.41	0.0129
1245	30	13.0	14.2	17.08	0.0093
115	60	11.5	14.4	13.87	0.0064
425	250	10.0	14.7	10.67	0.0033
1215	1440	10.0	14.7	10.67	0.0014

T - Time in minutes after initial mixing

f_M - Hygroscopic Moisture Factor

R h - Hydrometer Reading

L - Effective Depth, derived from table #2

Z - % suspended (prog. #1): input f_M, then each R h

GS - Grain Size (prog. #2): input T and L

Sample # 6 Grams used: 50.01 f_M 0.952

K = .01348

Clock Time	T	R h	L	Z	GS mm.
200	2	23.0	12.5	37.52	0.0337
203	5	21.5	12.8	34.66	0.0216
213	15	19.5	13.2	30.46	0.0126
228	30	17.0	13.5	25.21	0.0090
258	60	14.0	14.0	18.91	0.0065
653	250	11.5	14.4	13.66	0.0032
1158	1440	10.0	14.7	10.50	0.0014

Sample # 7 Grams used: 50 f_M 0.948

Clock Time	T	R h	L	Z	GS mm.
201	2	20.0	13.0	31.65	0.0344
204	5	18.0	13.3	27.43	0.0210
214	15	16.0	13.7	23.21	0.0129
229	30	14.0	14.0	18.99	0.0092
259	60	11.0	14.5	12.66	0.0066
609	250	10.5	14.6	11.60	0.0033
1159	1440	10.0	14.7	10.55	0.0014

Sample # 8 Grams used: 50 f_M 0.958

Clock Time	T	R h	L	Z	GS mm.
204	2	23.0	12.5	37.58	0.0337
207	5	22.0	12.7	35.49	0.0215
217	15	18.0	13.3	27.4	0.0127
232	30	14.0	14.0	18.79	0.0092
302	60	13.5	14.1	17.75	0.0065
612	250	10.5	14.1	11.48	0.0033
1202	1440	10.0	14.7	10.44	0.0014

Sample # 9 Grams used: 50 f_M 0.946

Clock Time	T	R h	L	Z	GS mm.
206	2	21.0	12.9	33.83	0.0342
209	5	20.0	13.0	31.71	0.0217
219	15	17.5	13.4	26.43	0.0127
234	30	14.0	14.0	19.03	0.0092
304	60	11.5	14.4	13.74	0.0066
614	250	10.0	14.7	10.57	0.0033
1204	1440	10.0	14.7	10.57	0.0014

Sample # 10 Grams used: 50 f_M 0.953

Clock Time	T	R h	L	Z	GS mm.
402	2	25.0	12.2	41.97	0.0333
905	5	22.0	12.7	35.68	0.0214
915	15	20.0	13.0	31.48	0.0125
930	30	17.0	13.5	25.18	0.0090
1000	60	14.0	14.0	18.89	0.0065
1100	250	11.5	14.5	13.64	0.0032
900	1440	9.0	14.8	8.39	0.0014

T - Time in minutes after initial mixing

f_M - Hygroscopic Moisture Factor

R - Hydrometer Reading
h

L - Effective Depth, derived from table #2

Z - Z suspended (prog. #1): input f_M, then each R
h

GS - Grain Size (prog. #2): input T and L

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Sample # 11 Grams used 50 f M 0.956

k = 0.01345

Clock Time	T	R h	L	Z	GS mm.
902	2	13.0	14.2	16.74	0.0359
905	5	12.0	14.3	14.64	0.0228
915	15	10.0	14.7	10.46	0.0133
930	30	9.5	14.75	9.41	0.0095
1000	60	9.0	14.80	8.37	0.0067
1:10	250	8.0	15.0	6.28	0.0033
900	1440	6.0	15.3	2.09	0.0014

Sample # 12 Grams used: 50.0 f M 0.952

Clock Time	T	R h	L	Z	GS mm.
903	2	23.0	12.5	37.92	0.0337
906	5	20.5	12.95	32.56	0.0217
916	15	17.5	13.4	26.26	0.0127
931	30	15.0	13.8	21.01	0.0091
1001	60	12.5	14.25	15.76	0.0066
1:11	250	10.0	14.7	10.50	0.0033
9:01	1440	8.0	15.0	6.30	0.0014

Sample # B-1 Grams used: 50 f M 0.955

Clock Time	T	R h	L	Z	GS mm.
907	2	6.0	15.3	2.09	0.0373
910	5	6.0	15.3	2.09	0.0236
920	15	5.5	15.4	1.05	0.0137
935	30	5.5	15.4	1.05	0.0097
1005	60	5.5	15.4	1.05	0.0068
1:15	250	5.0	15.5	0	0.0039
905	1440	6.0	15.3	2.09	0.0014

Sample # Comp Grams used: 50.0 f M 0.998

Clock Time	T	R h	L	Z	GS mm.
907	2	20.0	13.0	30.06	0.0344
910	5	16.5	13.6	23.05	0.0222
920	15	13.5	14.1	17.03	0.0131
935	30	12.5	14.25	15.03	0.0093
1005	60	12.0	14.3	14.03	0.0066
115	250	10.0	14.7	10.02	0.0033
905	1440	10.0	14.7	10.02	0.0014

Sample # Comp. Grams used: 50.0 f M 0.969

Clock Time	T	R h	L	Z	GS mm.
908	2	22.6	12.7	35.09	0.0340
911	5	20.5	12.95	31.99	0.0217
921	15	17.5	13.4	25.80	0.0127
936	30	15.5	13.75	21.67	0.0091
1006	60	14.0	14.0	18.58	0.0065
116	250	10.5	14.6	11.35	0.0033
906	1440	10.0	14.7	10.32	0.0014

T - Time in minutes after initial mixing

f - Hygroscopic Moisture Factor
M

R - Hydrometer Reading
h

L - Effective Depth, derived from table #2

Z - Z suspended (prog. #1): input f M, then each R h

GS - Grain Size (prog. #2): input T and L

000035A

nytest environmental inc.

Project No.: 90-16673

Log in No: 3871

P.O. No.: Pending

Date: March 31, 1990

ANALYTICAL DATA REPORT PACKAGE
FOR

Exxon USA

1400 Park Avenue

Linden, N.J. 07036

Re: Bayway
Attn: R.A. Greaux

SAMPLE IDENTIFICATION	LABORATORY NUMBER	TYPE OF SAMPLE	DATE AND TIME OF SAMPLE COLLECTION
Cores 1 - 12	See following pages.		

REPORT PREPARED BY:
PARAG K. SHAH, Ph. D.
ORGANIC LAB. MANAGER

DOUGLAS SHEELEY
LABORATORY DIRECTOR

NJ Cert. #73469

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

Remo Gigante

REMO GIGANTE
EXECUTIVE V.P.

Report on sample(s) furnished by client applies to sample(s). Report on sample(s) obtained by us applies only to lot sampled. Information contained herein is not to be used for reproduction except by special permission. Sample(s) will be retained for thirty days maximum after date of report unless specifically requested otherwise by client. In the event that there are portions or parts of sample(s) remaining after Nytest has completed the required tests, Nytest shall have the option of returning such sample(s) to the client at the client's expense.

nytest environmental inc.

PROJECT NO. 90-16673
LOGIN NO. 3871

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	Solid Phase Data Sheets Grain Size Data Sheets	

I. SCOPE OF WORK

The field sampling, biological assay and analytical testing described in this report was performed with respect to dredged material to be disposed of in ocean waters.

1. NEI Inc. was engaged to perform the following services in accordance with:

   Ecological Evaluation of Proposed Discharge of Dredged Material Into Ocean Waters
   (Implementation Manual for Section 103 of the Public Law 92-532 [Marine Protection, Research and Sanctuaries Act of 1972], EPA/COE (July 1977.)

   Guidance for Performing Tests on Dredged Material to be Disposed of in Ocean Waters
   EPA Region II/COE Regulatory Branch (Water Quality Compliance Section), (21 December 1984).

   a. Collection of twelve core samples of sediment to the project depth of 23+2 feet below mean low water were taken from locations identified on a Sampling Plan developed by the Army Corps of Engineers (ACE).

   b. Control and reference sediment samples were collected from locations designated by the ACE.

   c. Homogenized each core and provided homogeneous samples for bulk sediment analyses.

   d. Sediment samples from cores, composite, control and reference sediment were examined for particle grain size (ASTM Method D 422, March 1972) and percent moisture.

   e. Site water collection and elutriate preparation for chemical analyses.

   f. Perform solid phase bioassays to determine the acute 10-day toxicity to Mercenaria mencenaria, Palaemonetes pugio and Neries virens.

   g. Perform Bioaccumlation analysis on the test organisms (tissue samples) from the Solid Phase Bioassay.

II. METHODOLOGY

A. Sediment Sampling

1. Test sediments were cored on March 9 and 12, 1990 from 12 sampling points at the site of the proposed dredging. Sampling points were numbered 1-12 (See Figure 1). Sediment samples were cored to project depth.

2. Control sediment was Petersen-dredged from Milton Harbor, New York in ACE designated area (see Figure 2).

3. Reference Sediment was dredged from ACE designated area off the New Jersey coast (Loran C Coordinates on 9960 X and Y are 26910.7, 43629.2).

4. All test sediment samples were collected in new five-gallon polyethylene containers, covered with polyethylene lids and directly transported to the laboratory. Test, control and reference sediments as well as site water samples were maintained at 4 Deg. ± 2 Deg. C. prior to testing.

B. Bioassay/Bioaccumulation Procedures

1. Procedures for conducting the Solid Phase Bioassays, Bioaccumulations and grain size analysis:

   a. Ecological Evaluation of Proposed Discharge Of Dredged Material Into Ocean Waters

      (Implementation Manual for Section 103 of the Public Law 92-532 [Marine Protection, Research and Sanctuaries Act of 1972], EPA/COE (July 1977).

   b. Guidance For Performing Tests on Dredged Material to Be Disposed Of In Ocean Waters EPA Region II/COE Regulatory Branch (Water Quality Compliance Section), (21 December 1984).

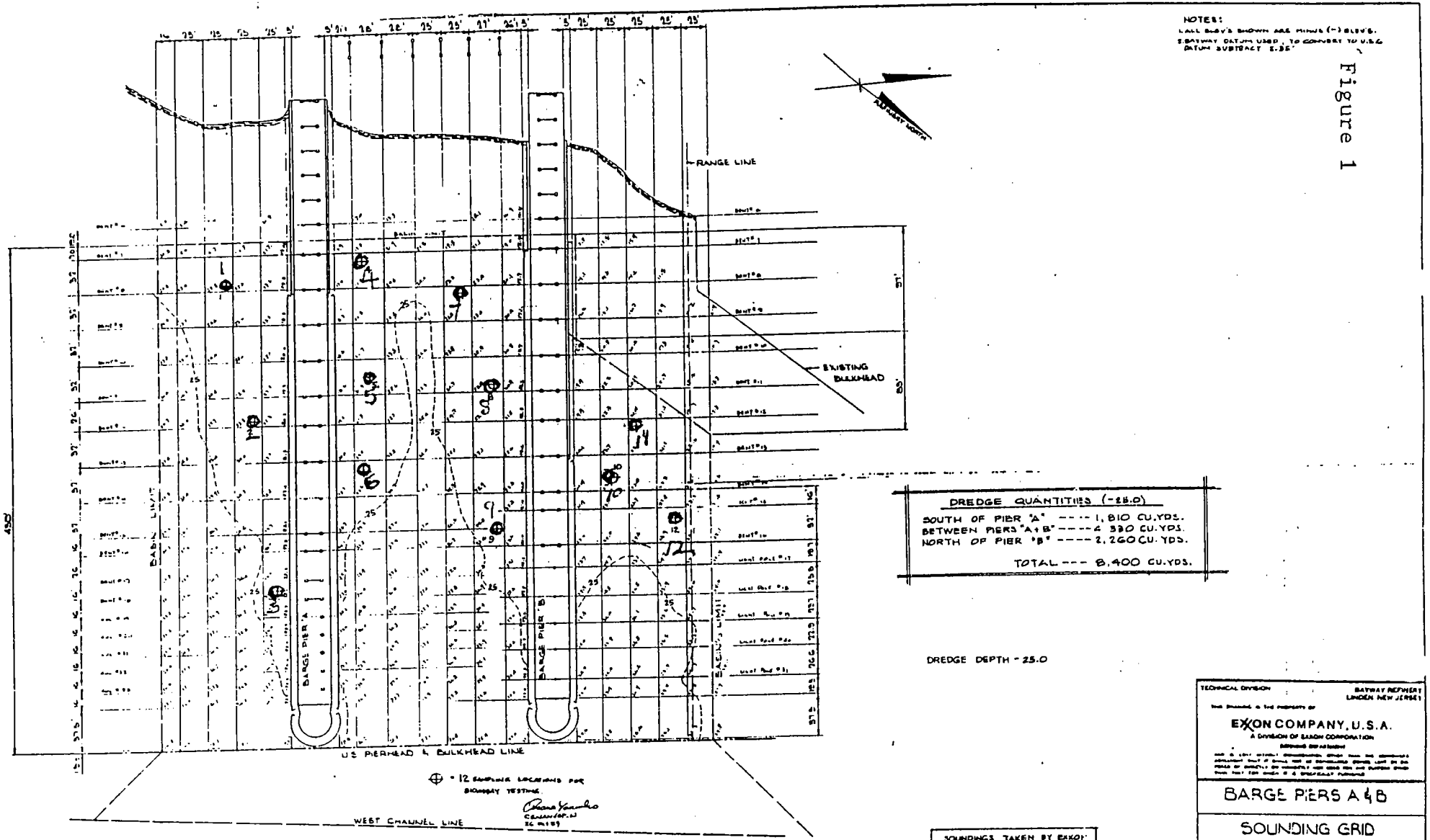
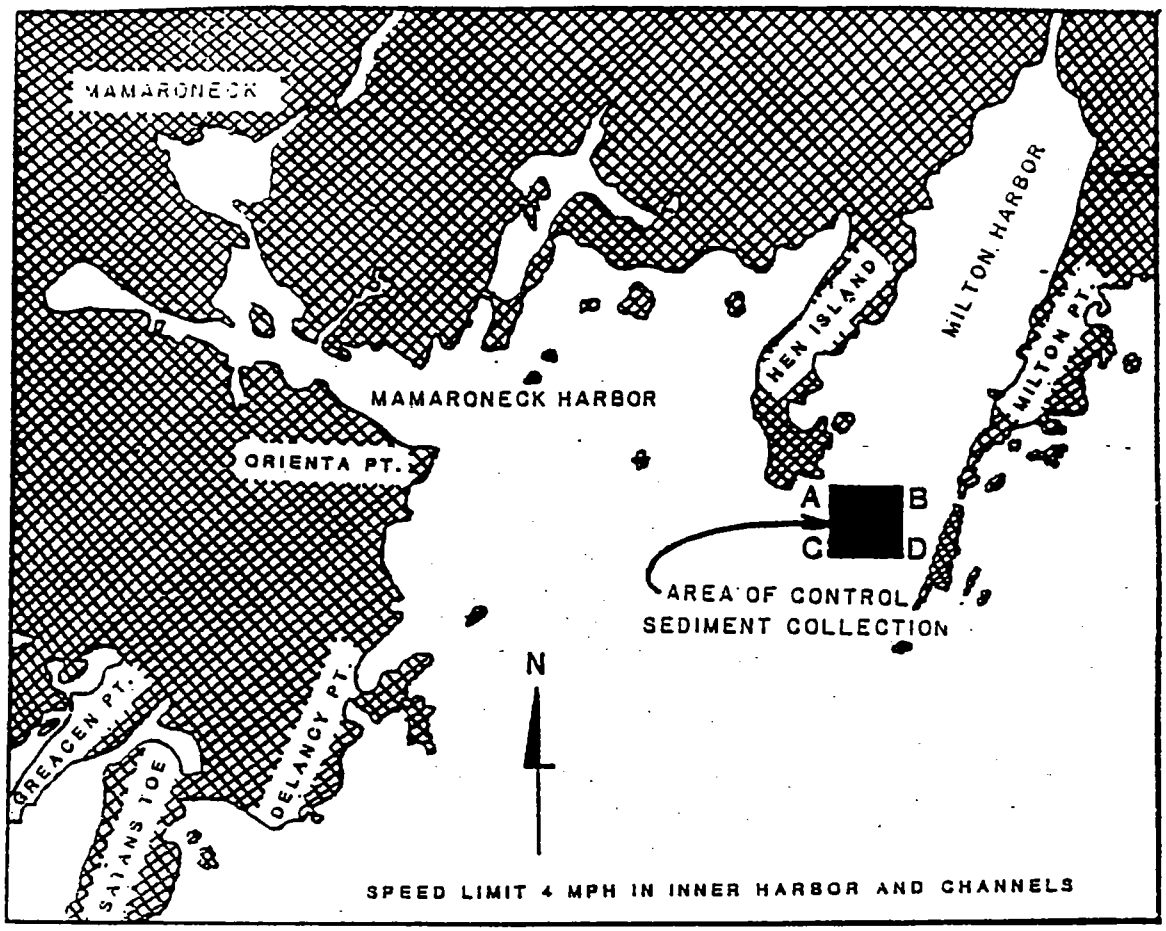

NOTES:
1. ALL ELEV'S SHOWN ARE MINUS (-) ELEV'S.
2. BATHY DATUM USED, TO CONVERT TO U.S.G. DATUM SUBTRACT 2.35'
ALTERNATE NORTH
RANGE LINE
EXISTING BULKHEAD
BARGE PIER 'A'
BARGE PIER 'B'
BASIN LIMIT
BASIN LIMIT
U.S. PIERHEAD & BULKHEAD LINE
⊕ = 12 SAMPLING LOCATIONS FOR BIOASSAY TESTING
WEST CHANNEL LINE
ARTHUR
KILL
DREDGE QUANTITIES (-25.0)
SOUTH OF PIER 'A' ---- 1,810 CU.YDS.
BETWEEN PIERS 'A & B' ---- 4,330 CU.YDS.
NORTH OF PIER 'B' ---- 2,260 CU.YDS.
TOTAL --- 8,400 CU.YDS.
DREDGE DEPTH - 25.0
SOUNDINGS TAKEN BY EXXON SURVEY PERSONNEL USING RAYTHEON PATHOMETER MODEL NO. 719C
DATE: JUNE 20/22/23, 1989
TECHNICAL DIVISION
BAYWAY REFINERY
LINDEN, NEW JERSEY
EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION
BARGE PIERS A & B
SOUNDING GRID
DRAWING
DATE
APPROVAL
DATE
JUNE 1989

Figure 1

3

Figure 2

Chart showing area for control sediment collection



SCALE 1:20,000 NAUTICAL MILES

1/2 0 1/2 1

YARDS

500 0 500 1000 1500

CORNER	
A	73° 42' 19"
	40° 56' 17"
B	73° 42' 08"
	40° 56' 17"
C	73° 42' 19"
	40° 56' 08"
D	73° 42' 08"
	40° 56' 08"

MILTON HARBOR

RYE, NEW YORK

C. Analysis

1. Solid Phase and grain size analyses were performed in the Sample Preparation Laboratory in accordance with the:

   Standard Method for Particle-Size Analysis of Soils ASTM Designation: D 422 - 63 (Reapproved 1972) American National Standard A37 145-1972 Approved March 2, 1972 by American National Standard Institute.

2. Test organism acclimations, Solid Phase Bioassays and organism depurations were performed in the Acute Laboratory. The environmentally controlled Acute Laboratory has a synthetic seawater supply system.

3. Mercenaria mercenaria were purchased from Mariculture Industries, Atlantic City, New Jersey. Nereis virens were purchased from Frank Hammond of Wiscasset, Maine. Palaemonetes pugio were purchased from Aquatic Indicators of St. Augustine, Florida. All organisms were acclimated to and tested in Forty Fathoms artificial seawater mix. No behavioral abnormalities were observed.

III. RESULTS

A. Solid Phase Bioassay

The 10-day Solid Phase Bioassay required that live counts be attempted each day. A definitive count could only be made at the end of the exposure (240-hour). See Tables 1.A-C for test results.

Table 1.A Results of the 10-day Solid Phase Bioassay. Testing was initiated with 20 Nereis virens per replicate.

Test Replicate Sample	Final Live Count
Control 1	19
Control 2	18
Control 3	17
Reference 1	19
Reference 2	18
Reference 3	19
Reference 4	18
Reference 5	19
Test 1	15
Test 2	14
Test 3	15
Test 4	15
Test 5	19

Table 1.B Results of the 10-day Solid Phase Bioassay. Testing was initiated with 20 Mercenaria mercenaria per replicate.

Test Replicate Sample	Final Live Count
Control 1	19
Control 2	20
Control 3	20
Reference 1	17
Reference 2	19
Reference 3	17
Reference 4	17
Reference 5	19
Test 1	19
Test 2	20
Test 3	20
Test 4	19
Test 5	18

Table 1.C Results of the 10-day Solid Phase Bioassay. Testing was initiated with 100 Paleomonetes pugio per replicate.

Test Replicate Sample	Final Live Count
Control 1	88
Control 2	87
Control 3	97
Reference 1	96
Reference 2	98
Reference 3	97
Reference 4	96
Reference 5	98
Test 1	95
Test 2	95
Test 3	95
Test 4	98
Test 5	69

III. RESULTS - cont'd.

Table 1.D Chemical ranges during the 10-day exposure per replicate

Concentration		pH	Salinity (ppt)
Control	1 - 3	7.8 - 8.2	28.0 - 32.0
Reference	1 - 5	7.8 - 8.2	28.0 - 33.0
Test	1 - 5	7.7 - 8.1	28.5 - 33.5

Table 1.E Chemical ranges during the 10-day exposure per replicate

Concentration		Temp. (C)	Dissolved Oxygen (ppm)
Control	1 - 3	19.5 - 21.0	5.5 - 8.1
Reference	1 - 5	19.0 - 21.5	5.3 - 8.0
Test	1 - 5	19.5 - 22.0	5.6 - 7.9

B. Physical Testing

Test sediment samples were cored from 12 project areas. Grain size and water content determinations were made for each test sediment, composite from the test sediments, reference and control sediment. Grain size distribution is defined by the following criteria:

Sand > 0 = to 0.0625 mm
Silt < 0.0625 but > 0.0039 mm
Clay < 0.0039 mm

See Table 2 for grain size and percent moisture results.

Table 2. Results of Grain Size and Moisture Content Analysis.

Sample ID	% Sand	% Silt	% Clay	% Moisture
CORE 1	91.9	3.98	4.12	70.13
CORE 2	91.67	5.19	3.14	66.45
CORE 3	93.02	4.54	2.44	67.65
CORE 4	96.14	2.37	1.49	63.43
CORE 5	95.06	2.92	2.02	64.45
CORE 6	91.43	5.12	3.45	63.85
CORE 7	93.85	3.58	2.57	70.60
CORE 8	90.49	5.98	3.53	65.99
CORE 9	93.36	4.09	2.56	68.18
CORE 10	91.39	4.20	4.41	64.91
CORE 11	96.01	2.62	1.37	58.34
CORE 12	91.58	5.70	2.72	70.13
COMPOSITE	91.51	5.09	3.40	71.17
CONTROL	92.02	4.00	3.98	20.89
REFERENCE	92.67	1.06	6.27	47.8

C. CHEMICAL TESTING

C-1 Elutriate Analysis

Results in ug/L (in triplicate)

	Cadmium	Mercury	Petroleum Hydrocarbons	PCB's	DDT's
1	< 0.1	< 0.2	< 50	< 0.1	< 0.05
2	< 0.1	< 0.2	< 50	< 0.1	< 0.05
3	< 0.1	< 0.2	< 50	< 0.1	< 0.05

Site Water Analysis

Results in ug/L (in triplicate)

	Cadmium	Mercury	Petroleum Hydrocarbons	PCB's	DDT's
1	< 0.01	< 0.2	< 50	< 0.1	< 0.05
2	< 0.01	< 0.2	< 50	< 0.1	< 0.05
3	< 0.01	< 0.2	< 50	< 0.1	< 0.05

C-2 Bulk Sediments

RESULTS IN PPM DRY WT. BASIS, EXCEPT WHERE NOTED:

SAMPLE IDENTIFICATION		COPPER	NICKEL	ZINC	% BY WT. TOC
CORE:	1	302	43.7	384	6.1
	2	287	41.5	349	5.6
	3	345	39.4	391	6.5
	4	410	49.2	463	11.5
	5	549	54.0	579	6.9
	6	134	40.9	344	4.8
	7	379	44.4	434	5.8
	8	280	41.0	359	5.2
	9	304	41.1	360	5.3
	10	327	43.7	378	5.7
	11	347	45.3	421	5.6
	12	309	41.6	389	6.3

III. RESULTS - cont'd.

C-3 2,3,7,8-TCDD

SEE FOLLOWING PAGES

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #1 CORE
Lab ID: 051566-0001-SA
Matrix: SOLID
Authorized: 20 FEB 90

Sampled: 09 FEB 90
Prepared: 08 MAR 90

Received: 19 FEB 90
Analyzed: 15 MAR 90

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	11	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	93			

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #2 CORE
Lab ID: 051566-0002-SA
Matrix: SOLID
Authorized: 20 FEB 90

Sampled: 09 FEB 90
Prepared: 08 MAR 90

Received: 19 FEB 90
Analyzed: 15 MAR 90

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	4.5	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	110			

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #3 CORE
Lab ID: 051566-0003-SA
Matrix: SOLID
Authorized: 20 FEB 90

Sampled: 09 FEB 90
Prepared: 08 MAR 90

Received: 19 FEB 90
Analyzed: 15 MAR 90

Sample Amount 10.1 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	4.1	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	54			

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #4 CORE
Lab ID: 051566-0004-SA
Matrix: SOLID Sampled: 09 FEB 90 Received: 19 FEB 90
Authorized: 20 FEB 90 Prepared: 08 MAR 90 Analyzed: 15 MAR 90

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	8.5	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	73			

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #5 CORE
Lab ID: 051566-0005-SA
Matrix: SOLID Sampled: 09 FEB 90 Received: 19 FEB 90
Authorized: 20 FEB 90 Prepared: 08 MAR 90 Analyzed: 15 MAR 90

Sample Amount 10.1 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	3.4	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	44			

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #6 CORE
Lab ID: 051566-0006-SA
Matrix: SOLID Sampled: 09 FEB 90 Received: 19 FEB 90
Authorized: 20 FEB 90 Prepared: 08 MAR 90 Analyzed: 15 MAR 90

Sample Amount 10.1 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	12	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	95			

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #7 CORE
Lab ID: 051566-0007-SA
Matrix: SOLID Sampled: 09 FEB 90 Received: 19 FEB 90
Authorized: 20 FEB 90 Prepared: 08 MAR 90 Analyzed: 15 MAR 90

Sample Amount 10.3 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	16	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	111			

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #8 CORE
Lab ID: 051566-0008-SA
Matrix: SOLID Sampled: 09 FEB 90 Received: 19 FEB 90
Authorized: 20 FEB 90 Prepared: 08 MAR 90 Analyzed: 15 MAR 90

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	14	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	118			

ND = Not detected
NA = Not applicable

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #9 CORE
Lab ID: 051566-0009-SA
Matrix: SOLID Sampled: 09 FEB 90 Received: 19 FEB 90
Authorized: 20 FEB 90 Prepared: 08 MAR 90 Analyzed: 15 MAR 90

Sample Amount 10.1 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	20	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	104			

ND = Not detected
NA = Not applicable

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #10 CORE
Lab ID: 051566-0010-SA
Matrix: SOLID Sampled: 09 FEB 90 Received: 19 FEB 90
Authorized: 20 FEB 90 Prepared: 08 MAR 90 Analyzed: 15 MAR 90

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	15	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	100			

ND = Not detected
NA = Not applicable

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #11 CORE
Lab ID: 051566-0011-SA
Matrix: SOLID
Authorized: 20 FEB 90

Sampled: 09 FEB 90
Prepared: 08 MAR 90

Received: 19 FEB 90
Analyzed: 15 MAR 90

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	7.8	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	105			

ND = Not detected
NA = Not applicable

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: #12 CORE
Lab ID: 051566-0012-SA
Matrix: SOLID
Authorized: 20 FEB 90

Sampled: 09 FEB 90
Prepared: 08 MAR 90

Received: 19 FEB 90
Analyzed: 15 MAR 90

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	12	pg/g	--	
	% Recovery			
13C-2,3,7,8-TCDD	127			

ND = Not detected
NA = Not applicable

2,3,7,8-TCDD

HIGH RESOLUTION

Client Name: NYTEST Environmental
Client ID: Method Blank
Lab ID: 051566-0001-MB
Matrix: SOLID
Authorized: NA

Sampled: NA
Prepared: 08 MAR 90

Received: NA
Analyzed: 15 MAR 90

Sample Amount 10.0 G
Percent Moisture NA
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Dioxins				
2,3,7,8-TCDD	ND	pg/g	0.17	
	% Recovery			
13C-2,3,7,8-TCDD	117			

III. RESULTS - cont'd.

D. BIOACCUMULATION ANALYSIS: Palaemonetes pugio

RESULTS IN MG/KG:

Reference	Cadmium	Mercury	Petroleum Hydrocarbons as C-10	PCB's	DDT's
1	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
2	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
4	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
5	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
Test					
1	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
2	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
4	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
5	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A*	**	**	< 0.1	< 0.04	< 0.02
3B*	**	**	< 0.1	< 0.04	< 0.02
3C*	**	**	< 0.1	< 0.04	< 0.02

*Re-extracted samples

**Metals could not be re-extracted

< = less than

III. RESULTS - cont'd.

D. BIOACCUMULATION ANALYSIS: Mercenaria mercenaria

RESULTS IN MG/KG:

Reference	Cadmium	Mercury	Petroleum Hydrocarbons as C-10	PCB's	DDT's
1	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
2	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
4	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
5	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
Test					
1	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
2	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
4	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
5	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A*	**	**	< 0.1	< 0.04	< 0.02
3B*	**	**	< 0.1	< 0.04	< 0.02
3C*	**	**	< 0.1	< 0.04	< 0.02

*Re-extracted samples

**Metals could not be re-extracted

< = less than

III. RESULTS - cont'd.

D. BIOACCUMULATION ANALYSIS: Nereis virens

RESULTS IN MG/KG:

Reference	Cadmium	Mercury	Petroleum Hydrocarbons as C-10	PCB's	DDT's
1	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
2	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
4	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
5	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
Test					
1	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
2	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
4	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
5	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
3A*	**	**	< 0.1	< 0.04	< 0.02
3B*	**	**	< 0.1	< 0.04	< 0.02
3C*	**	**	< 0.1	< 0.04	< 0.02

*Re-extracted samples

**Metals could not be re-extracted

< = less than

III. RESULTS - cont'd.

D-1 PRETEST ORGANISMS (IN TRIPLICATE)

RESULTS IN MG/KG

IDENTIFICATION	CADMIUM	MERCURY	TOTAL PETROLEUM HYDROCARBONS AS C-10	PCB'S	DDT'S
Nereis virens					
A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
Mercenaria mercenaria					
A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
Paleamonetes pugio					
A	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
B	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02
C	< 0.25	< 0.20	< 0.1	< 0.04	< 0.02

IV. DISCUSSION

A. Solid Phase Bioassays

As detailed in Tables 1.A through 1C, there were no statistically significant control or reference organism mortality (visual observation of the data). The following mortalities were observed in the test organisms:

Nereies virens:	22%
Palaemonetes pugio:	9.6%
Mercenaria mercenaria:	4 %

B. Physical Testing

Test sediment samples were cored from 12 project area. No discreet strata were observed in any of the 12 cores. All cores were homogenous with no intra-core variation. Grain size and water content determinations were made for each test sediment, composite from the 12 test sediments, reference and control sediment.

C. Site Water

There were no ACE/EPA criteria for site water.

D. Elutriate Analysis

There are no formalized ACE/EPA criteria for Elutriate contaminant levels.

E. Bulk Analysis

Bulk sediment analysis was not performed as a regulatory function. The data is generated to better understand contaminant distribution from site to site.

2,3,7,8-TCDD was found in every sample analyzed.

IV. DISCUSSION - cont'd.

F. Bioaccumulation Analysis

Control tissue was not evaluated for bioaccumulation and is being maintained frozen in accordance with ACE/EPA protocol. Reference tissue was analyzed as a baseline for interpreting the test sediment tissue data. Table 4 details ACE/EPA tissue limits and whether matrix limits were exceeded.

Table 4. ACE/EPA Bioaccumulation Matrix for PHC, PCB, DDT's, HG and Cd for Surviving Test Solid Phase Organisms. [*] denotes that the matrix value was exceeded by test values.

Contaminant	p. pugio	M. mercenaria	N. virens
DDT	[ ] > 0.05 ppm	[ ] > 0.05 ppm	[ ] > 0.05 ppm

APPENDIX

Air dried

Client: EXXON BAYWAY/

	3/6/90	3/13/90 Air Dry						Effect. Depth
Sample #	Pan Weight	Pan Weight & Wet Sed.	Pan Weight & Air Dry	Percent Moisture	Pan Weight & Oven Dry	Hygroscopic Moisture %	HMCF ¤	Grams used for sed.
1	9.70gm	317.70gm	101.71gm	70.13%		4.86%	.949	50.0
2	10.55gm	334.25gm	119.14gm	66.45%		4.56%	.954	50.0
3	9.85gm	329.70 gm	112.65gm	67.65%		5.45%	.945	50.0
4	8.85gm	332.55gm	127.23gm	63.43%		6.40%	.936	50.0
5	9.50gm	310.00gm	116.34gm	64.45%		6.33%	.937	50.0
6	9.95gm	393.80gm	148.70gm	63.85%		4.84%	.952	50.0
7	10.10gm	233.25gm	75.70gm	70.60%		5.20%	.948	50.0
8	11.55gm	236.75gm	88.15gm	65.99%		4.23%	.958	50.0
9	7.80gm	277.75gm	93.71gm	68.18%		5.39%	.946	50.0
10	10.65gm	307.75gm	114.90gm	64.91%		4.79%	.953	50.0
11	9.55gm	280.50gm	122.42gm	58.34%		4.42%	.956	50.0
12	11.70gm	253.40gm	88.10gm	70.13%		4.80%	.952	50.0
Composite	13.75gm	239.70gm	78.90gm	71.17%		4.49%	.955	50.0
Reference	16.50gm	237.78gm	191.56gm	20.89%		0.18%	.998	50.0
Mitkus (Control) Harbor	14.70gm	222.0gm	122.74gm	47.88%		3.13%	.969	50.0
	MK	MK	MK	MK		MK	MK	MK

¤ Percent Moisture = $\frac{\text{(Wet sample \& dish) - (Dry sample \& dish)}}{\text{(Wet sample \& dish) - dish}} \times 100$

Hygroscopic Moisture Correction Factor = oven dried / air dried

Grain Size Analysis

Core #	Y Intercept	Slope	% Sand	% Silt	% Clay
1	12.07	1.43	91.90	3.98	4.12
2	13.52	1.87	91.67	5.19	3.14
3	11.51	1.64	93.02	4.54	2.44
4	6.23	0.86	96.14	2.37	1.49
5	7.85	1.05	95.06	2.92	2.02
6	13.69	1.85	91.43	5.12	3.45
7	9.73	1.29	93.85	3.58	2.57
8	15.48	2.16	90.49	5.98	3.53
9	10.73	1.47	93.36	4.09	2.56
10	12.81	1.53	91.39	4.20	1.51
11	6.61	0.95	96.01	2.62	1.37
12	14.11	2.05	91.58	5.70	2.72
Composite	13.58	1.84	91.51	5.09	3.40
Control	11.98	1.44	92.02	4.00	3.98
Reference	8.39	0.38	92.67	1.06	6.27

$y = m.\ lm\ (x) + b$

From the above data the % Clay, % Sand, and % Silt was generated by computer using the "numerical method for line best fitting data".

Date: 3/14/90 Sit Exxon Bayway Dispersant correctio 5

NJ# 90 CS
EXXON BAYWAY, NY TC

Sample # 6 Grams used: 50.0 f 4.84
M

K=.01345

Clock Time	T	R h	L	Z	GS mm.
200	2	23.0	12.5	7.44	.0337
203	5	21.5	12.8	6.82	.0216
213	15	19.5	13.2	5.99	.0126
228	30	17.0	13.5	4.96	.0090
258	60	14.0	14.0	3.72	.0065
608	250	11.5	14.4	2.69	.0032
X158	1440	10.0	14.7	2.07	.0014

Sample # 7 Grams used: 50.0 f 5.20
M

Clock Time	T	R h	L	Z	GS mm.
201	2	20.0	13.0	5.77	.0344
204	5	~~20~~ 18.0	13.3	5.00	.0210
214	15	16.0	13.7	4.23	.0129
229	30	14.0	14.0	3.46	.0092
259	60	11.0	14.5	2.31	.0066
609	250	10.5	14.6	2.12	.0033
X159	1440	10.0	14.7	1.92	.0014

Sample # 8 Grams used: 50.0 f 4.23
M

Clock Time	T	R h	L	Z	GS mm.
204	2	23.0	12.5	8.51	.0337
207	5	22.0	12.7	8.04	.0215
217	15	18.0	13.3	6.15	.0127
232	30	14.0	14.0	4.26	.0092
302	60	13.5	14.1	4.02	.0065
602	250	10.5	14.6	2.60	.0033
X202	1440	10.0	14.7	2.36	.0014

Sample # 9 Grams used: 50.0 f 5.39
M

Clock Time	T	P h	L	Z	GS mm.
208	2	21.0	12.9	5.94	.0342
209	5	20.0	13.0	5.57	.0217
219	15	17.5	13.4	4.64	.0127
234	30	14.0	14.0	3.34	.0092
304	60	11.5	14.4	2.41	.0066
614	250	10.0	14.7	1.86	.0033
X204	1440	10.0	14.7	1.86	.0014

Sample # 10 Grams used: 50.0 f 4.75
M

Clock Time	T	R h	L	Z	GS mm.
902	2	25.0	12.2	8.42	.0333
905	5	22.0	12.7	7.16	.0214
915	15	20.0	13.0	~~6.32~~ 6.37	.0125
930	30	17.0	13.5	5.06	.0090
1000	60	14.0	14.0	3.79	.0065
110	250	11.5	14.5	2.74	.0032
900	1440	9.0	14.8	1.68	.0014

3/16/90

T - Time in minutes after initial mixing

f - Hygroscopic Moisture Factor
M

R - Hydrometer Reading
h

L - Effective Depth, derived from table #2

Z - Z suspended (prog. #1): input f , then each R
M h

GS - Grain Size (prog. #2): input T and L

00034

Date: 3/14/90 Site: Dixon Bayway

Dispersant correction: 5

JOB# 9025
EXXON BAYWAY
NY TEST

Sample # 1 Grams used: 50.0 f 486
M

K = .01348

Clock Time	T	R h	L	susp. Z	GS mm.
1200	2	24.5	12.4	8.02	.0336
1203	5	22.0	12.7	7.00	.0215
1213	15	20.0	13.0	6.17	.0125
1228	30	15.0	13.8	4.11	.0091
1258	60	13.5	14.1	3.50	.0065
408	250	10.5	14.6	2.26	.0033
1158	1440	10.0	14.7	2.06	.0014

Sample # 2 Grams used: 50.0 f 4.56
M

Clock Time	T	R h	L	Z	GS mm.
1203	2	23.0	12.5	7.89	.0337
1206	5	19.5	13.1	6.36	.0218
1216	15	17.5	13.4	5.48	.0127
1231	30	14.5	13.9	4.17	.0092
101	60	13.0	14.2	3.51	.0066
411	250	10.0	14.7	2.19	.0033
1201	1440	10.0	14.7	2.19	.0014

Sample # 3 Grams used: 50.0 f 5.45
M

Clock Time	T	R h	L	Z	GS mm.
1206	2	22.5	12.6	6.42	.0338
1209	5	20.0	13.0	5.50	.0217
1215	15	17.0	13.5	4.40	.0128
1234	30	14.0	14.0	3.30	.0092
104	60	12.5	14.25	2.75	.0066
414	250	10.0	14.7	1.83	.0033
1204	1440	9.0	14.8	1.47	.0014

Sample # 34 Grams used: 50.0 f 6.46
M

Clock Time	T	R h	L	Z	GS mm.
1212	2	16.0	13.7	3.44	.0353
1215	5	15.5	13.75	3.28	.0224
1225	15	13.5	14.1	2.66	.0131
1240	30	11.0	14.5	1.88	.0094
110	60	10.0	14.7	1.56	.0067
420	250	9.0	14.8	1.25	.0033
1210	1440	8.0	15.0	.94	.0014

Sample # 5 Grams used: 50.0 f 6.33
M

Clock Time	T	R h	L	Z	GS mm.
1217	2	20.5	12.95	4.90	.0343
1220	5	17.0	13.5	3.79	.0221
1230	15	15.5	13.75	3.32	.0129
1245	30	13.0	14.2	2.53	.0093
115	60	11.5	14.4	2.06	.0066
425	250	10.0	14.7	1.58	.0033
1215	1440	10.0	14.7	1.58	.0014

T - Time in minutes after initial mixing

f - Hygroscopic Moisture Factor
M

R - Hydrometer Reading
h

L - Effective Depth, derived from table #2

Z - Z suspended (prog. #1): input f , then each R
M h

GS - Grain Size (prog. #2): input T and L

Test Type: SOLID PHASE Lab: ACCURE

Acclimatization Starting Date: 2/16/90 Exposure Starting Date: 2/19/90 Depuration Starting Date: 2/1 /90

Live Count

		N. virens						P. dugio						CLAMS M. mercenaria					
	Rep	a1	a2	a3	0	10	d[illegible]	a1	a2	a3	0	10	d[illegible]	a1	a2	a3	0	10	d[illegible]
Control	1	20			20*	19	19				100	~~98~~		20			20	19	19
	2	20			20	18	18				100	87		20			20	20	20
	3	20			20	17	17				100	97		20			20	20	20
Reference	1	20			20	19	19				100	~~98~~ 96		20			20	~~17~~ 19	17
	2	20			20	18	18				100	96		20			20	19	19
	3	20			20	19	19				100	97		20			20	17	17
	4	20			20	18	18				100	96		20			20	19	19
	5	20			20	~~20~~ 19	19				100	~~96~~ 98		20			20	19	19
Test Sed.	1	20			20	15	15				100	~~95~~ 96		20			20	19	19
	2	20			20	14	14				100	~~95~~ 97		20			20	20	20
	3	20			20	15	15				100	~~95~~ 97		20			20	20	20
	4	20			20	~~17~~ 15	15				100	~~96~~ 98		20			20	19	19
	5	20			20	19	19				100	~~96~~ 96		20			20	~~19~~ 18	18
Initials		MPK			MPK	MPK	MPK				MPK	MPK		MPK			MPK	MPK	MPK

NOTES: * Day 0 - one worm had a main section dead but was still alive among R, placed 2-19-90 MPK

DAY 1 - a small ~1" piece of a worm being eaten by shrimp in #5 Ref Tank

DAY 2 - 1 M. ~~mercenaria~~ IN REF TANK #4 is DEAD & being scavenged - ADJ. FLOW TO 66ml/min

DAY 3 - REF SED 1 - ONE DEAD CLAM - REMOVED / CONTROL - SHRIMP EATING PIECE OF WORM

DAY 4 - NUA - adjusted flows to 66 ml/min - MPK AM PIECE Removed MPK adj Flows@

1-PM - FOUND DEAD CLAM IN REF #4

Day 5 - Test 4&5 ~~morphine~~ : last 1 & 3 shrimp eating piece of worm

Day 6 - N.U.O.

DAY 7 - 2 DEAD CLAMS IN REF #2 Removed - AM / 17:00 - REMOVED 1 DEAD CLAM FROM REF #3 AM

ADJ. FLOW RATE, SALINITY IN TANK A

DAY 8 · REF #2 - P. Dugio FEEDING ON A N. VIRENS, CLEAR FLOW

DAY 9 REF #4 - REMOVED 1 MEAN CLAM - SHELL APPEARS TO HAVE BEEN CRACKED BEFORE STN

Removed dead clam from test - reference tank #5

154-63 Dugio

Test Type: [illegible] Lab: [illegible]

Temperature	Repl.	a1	a2	a3	0	1	2	3	4	5	6	7	8	9	10	d1	d2	d3
Control	1	20			20.5	20	[illegible]	21.0	21.0	[illegible]	21.0	20.5	[illegible]	21.0	20.0			
	2	20			20.5	20	19.5	21.0	21.0	21.0	21.0	21.0	20.5	21.0	19.5			
	3	20			20.5	20	19.5	21.0	21.0	21.0	21.0	20.5	20.5	21.0	19.5			
Reference	1	20			21	20.5	[illegible]	21.0	21.5	21.5	[illegible]	[illegible]	21.0	21.0	20.0			
	2	20			21	20.5	[illegible]	21.0	21.5	21.5	21.0	19.5	20.5	21.0	19.5			
	3	20			21	20.5	[illegible]	21.0	21.5	21.5	21.0	19.5	20.5	20.5	20.0			
	4	20			21	21.5	[illegible]	21.0	21.5	21.5	21.0	19.0	20.5	20.5	19.5			
	5	20			21	21.5	20.5	21.0	21.0	21.5	21.0	20.5	20.5	20.5	19.5			
Test Sediment	1	20			21	21.5	20.5	21.0	21.0	21.5	21.0	21.5	21.5	20.5	20.0			
	2	20			21	21.5	20.5	21.0	21.0	21.5	21.0	20.5	21.5	20.5	20.5			
	3	20			21	22	20.5	21.0	21.5	21.5	21.0	20.5	21.0	20.5	20.5			
	4	20			21	22	20.5	21.0	21.0	21.5	21.0	19.5	21.0	21.0	20.0			
	5	20			21	22	20.5	21.5	21.0	21.5	21.0	20.5	21.5	21	20.5			
Initials		MK			MOK	MOK	[illegible]	MOK	MOK	[illegible]	[illegible]	[illegible]	[illegible]	MOK	[illegible]			

pH	Repl.	a1	a2	a3	0	1	2	3	4	5	6	7	8	9	10	d1	d2	d3
Control	1	7.80			7.9	8.1	7.9	7.9	7.9	8.1	8.0	7.9	8.1	8.0	7.8			
	2	7.8			7.9	8.1	7.9	8.0	8.0	8.2	8.1	8.1	8.1	8.0	7.9			
	3	7.8			7.9	8.0	7.8	7.9	7.9	8.1	8.0	8.0	8.0	8.0	7.9			
Reference	1	7.8			8.0	8.0	8.0	7.9	7.9	8.2	8.1	8.1	8.1	8.0	8.0			
	2	7.9			8.0	8.0	7.9	7.9	7.9	8.0	7.8	8.0	8.0	7.9	8.0			
	3	7.9			8.0	8.0	8.0	7.9	7.9	8.2	8.1	8.1	8.1	7.9	8.0			
	4	7.9			8.0	8.1	8.0	7.9	7.9	8.2	8.2	8.1	8.1	7.9	8.0			
	5	7.9			8.0	8.1	8.0	7.8	8.0	8.2	8.2	8.1	8.1	8.0	8.0			
Test Sediment	1	8.0			8.1	8.1	7.8	7.9	8.0	8.1	8.1	8.1	8.1	8.0	8.0			
	2	8.1			8.0	8.1	7.8	7.9	7.9	8.1	8.1	8.0	8.0	8.0	8.0			
	3	8.0			8.0	8.1	7.7	7.9	8.0	8.1	8.0	8.0	8.0	8.1	8.0			
	4	8.0			8.0	8.0	7.8	7.9	8.0	8.1	8.0	7.9	8.0	8.0	8.0			
	5	8.0			8.0	8.0	7.9	7.9	7.7	8.1	8.1	8.0	8.0	8.0	8.0			
Initials		MOK			[illegible]													

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Test Type: SOLID PHASE Lab: ACUTE

D.O. ppm	Repl.	a1	a2	a3	0	1	2	3	4	5	6	7	8	9	10	d1	d2	d3
Control	1	6.8			6.8	6.0	6.6	6.7	6.1	6.8	6.5	6.6	6.9	6.7	5.1			
	2	6.7			6.8	5.7	6.2	6.4	5.8	6.9	6.7	6.9	7.2	6.5	5.1			
	3	6.6			6.8	5.5	5.7	6.8	5.8	6.7	6.4	6.6	6.8	6.6	8.0			
Reference	1	6.6			6.8	5.5	5.7	6.6	5.6	7.0	6.8	6.9	7.2	6.9	7.9			
	2	6.8			6.8	5.3	5.8	6.6	5.8	6.8	6.3	6.9	7.1	6.8	7.9			
	3	6.8			6.8	5.7	5.6	6.6	5.5	6.9	6.8	7.0	7.1	6.6	8.0			
	4	6.8			6.8	6.2	6.2	6.7	6.1	6.8	6.7	6.9	7.1	6.5	7.8			
	5	6.8			6.8	6.1	6.4	6.7	6.3	6.8	6.8	7.0	7.2	6.5	8.0			
Test Sediment	1	6.8			6.8	6.1	6.3	6.8	6.5	6.6	6.4	6.7	7.0	6.7	7.8			
	2	6.8			6.9	5.7	6.0	6.6	6.0	6.2	6.4	6.4	6.6	6.5	7.7			
	3	6.8			6.8	6.2	6.3	7.0	6.2	6.4	6.2	6.4	6.6	6.5	7.7			
	4	6.9			6.8	5.6	6.3	7.0	6.5	6.4	6.4	6.6	6.9	6.7	7.7			
	5	6.9			6.8	6.0	6.5	7.1	6.7	6.7	6.7	7.0	7.3	6.8	7.9			
Initials		MK			MK	MK	JM	MK	MK			KE	KE	JM	GB			

Salinity	Repl.	a1	a2	a3	0	1	2	3	4	5	6	7	8	9	10	d1	d2	d3
Control	1	28.5			28.5	28.0	31.5	31.5	30.5	32.0	29.5	28.5	29.0	30.0	30.0			
	2	28.5			28.5	28.5	31.5	31.0	30.5	32.0	29.0	29.0	29.5	30.0	30.0			
	3	28.5			28.5	29.5	31.5	31.0	30.0	32.0	30.0	29.0	29.0	30.0	29.5			
Reference	1	28.5			28.5	28.0	31.5	31.0	31.0	33.0	29.5	29.0	29.5	30.5	30.0			
	2	28.5			28.5	28.0	31.5	31.0	31.0	33.0	29.5	29.0	29.0	30.5	30.0			
	3	28.5			28.5	28.0	31.5	30.5	31.0	33.0	29.5	29.0	29.0	31.0	30.0			
	4	28.5			28.5	28.0	31.5	31.0	31.0	33.0	29.5	31.0	29.0	31.0	29.0			
	5	28.5			28.5	28.0	31.5	31.0	31.0	33.0	29.5	28.5	29.0	31.0	30.0			
Test Sediment	1	28.5			28.5	29.0	31.5	31.0	31.0	33.5	29.5	29.0	30.0	30.0	30.0			
	2	28.5			28.5	29.0	31.5	31.5	30.5	33.5	29.5	29.0	29.5	30.5	30.0			
	3	28.5			28.5	28.5	31.5	31.0	30.0	33.5	29.5	29.5	29.0	30.5	30.0			
	4	28.5			28.5	28.5	31.0	31.0	30.5	33.5	29.5	30.0	29.5	30.5	30.0			
	5	28.5			28.5	28.5	31.5	31.5	31.5	33.5	29.5	29.5	29.0	30.5	30.0			
Initials		MK			MK	MK	JM	MK	MK			KE	KE	JM	GB			

TEST ORGANISM TRANSPORTATION

Date: 2/14/90

In-lab, mobile, or satellite (circle 1)

Test Species: Ml mercenaria

Total number of organisms acclimated: 320

A. Organisms

1. ASI culture (Tank & Log #): —

2. Procured from: 90-9.5

3. Age: NA

B. Holding Water

1. Temperature: 20.0 °C

2. Salinity: dry

* Notes:

C. Destination

1. Laboratory arrival date/time: 2/14/90 PM

2. Arrival holding water temperature: NA

3. Acclimation water temperature: NA

4. Acclimation water salinity: NA

* Notes:

D. Acclimation

1. Holding water volume (1 gal=3.8L): NA

2. Acclimation chamber volume: NA

3. Acclimation began (date & time): NA

4. Changeover rate (ml/minute)(2 drops=1ml): NA

5. Acclimation ended (date & time): NA

TEST ORGANISM TRANSPORTATION

Date: 2/16/90

Client: _____ In-lab, mobile, or satellite (circle 1)

Test Species: N virens

Total number of organisms acclimated: 300

A. Organisms

1. ASI culture (Tank & Log #): —

2. Procured from: 90-4

3. Age: NA

B. Holding Water

1. Temperature: 25.5 °C

2. Salinity: 31.5 ppt

* Notes: _____

C. Destination

1. Laboratory arrival date/time: 2/16/90 2PM

2. Arrival holding water temperature: 24.0 °C

3. Acclimation water temperature: NA

4. Acclimation water salinity: NA

* Notes: _____

D. Acclimation

1. Holding water volume (1 gal=3.8L): NA

2. Acclimation chamber volume: NA

3. Acclimation began (date & time): NA

4. Changeover rate (ml/minute)(2 drops=1ml): NA

5. Acclimation ended (date & time): NA

TEST ORGANISM TRANSPORTATION

Date: 2/19/90

In-lab, mobile, or satellite (circle 1)

Test Species: A. amoena

Total number of organisms acclimated: 1400

A. Organisms

1. ASI culture (Tank & Log #): —

2. Procured from: 90-5

3. Age: N/A

B. Holding Water

1. Temperature: 25.5°C

2. Salinity: 31.5 ppt

* Notes:

C. Destination

1. Laboratory arrival date/time: 2/19/90 11:00AM

2. Arrival holding water temperature: 23.0°C

3. Acclimation water temperature: N/A

4. Acclimation water salinity: N/A

* Notes:

D. Acclimation

1. Holding water volume (1 gal=3.8L): N/A

2. Acclimation chamber volume: N/A

3. Acclimation began (date & time): N/A

4. Changeover rate (ml/minute)(2 drops=1ml): N/A

5. Acclimation ended (date & time): N/A

EXXON BAYWAY NJTE

Date: 3/16/90 Si Exxon Bayway Dispersant correction: 5

Sample # 11 Grams used: 50.0 f M 4.42

K = .01348

Clock Time	T	R h	L	Z	GS mm.
902	2	13.0	14.2	3.62	.0359
905	5	12.0	14.3	3.17	.0228
915	15	10.6	14.7	2.26	.0133
930	30	9.5	14.75	2.04	.0095
1000	60	9.0	14.8	1.81	.0067
1:10	250	8.0	15.0	1.36	.0033
900	1440	6.0	15.3	.45	.0014

Sample # Control Grams used: 50.0 f M ~~4.1~~ 3.13

Clock Time	T	R h	L	Z	GS mm.
907	2	20.0	13.0	9.58	.0344
9:10	5	16.5	13.6	7.35	.0222
9:20	15	13.5	14.1	5.43	0.0131
9:35	30	13.5	14.25	4.79	.0093
10:05	60	12.6	14.3	4.47	.0066
1:15	250	10.0	14.7	3.19	.0033
9:05	1440	10.0	14.7	3.19	.0014

Sample # 12 Grams used: 50.0 f M 4.80

Clock Time	T	R h	L	Z	GS mm.
903	2	23.0	12.5	7.5	.0337
906	5	20.5	12.55	6.46	.0217
916	15	17.5	13.4	5.21	.0127
931	30	15.0	13.8	4.17	.0091
10:01	60	12.5	14.25	3.13	.0066
1:11	250	10.0	14.7	2.08	.0033
9:01	1440	8.0	15.0	1.25	.0014

Sample # Comp Grams used: 50.0 f M ~~3.13~~ 4.49

Clock Time	T	R h	L	Z	GS mm.
908	2	22.0	12.7	7.51	.0340
9:11	5	20.5	12.55	6.90	.0217
9:21	15	17.5	13.4	5.57	.0127
9:36	30	15.5	13.75	4.68	.0091
10:06	60	14.0	14.0	4.01	.0065
1:16	250	10.5	14.6	2.45	.0033
9:06	1440	10.0	14.7	2.23	.0014

Sample # Ref Grams used: 50.0 f M 0.18

Clock Time	T	R h	L	Z	GS mm.
907	2	6.0	15.3	11.11	.0373
910	5	6.0	15.3	11.11	.0236
9:20	15	5.5	15.4	5.56	.0137
9:35	30	5.5	15.4	5.56	.0097
10:05	60	5.5	15.4	5.56	.0068
1:15	250	5.0	15.5	0	.0034
9:05	1440	6.0	15.3	11.11	.0014

T - Time in minutes after initial mixing

f - Hygroscopic Moisture Factor
M

R - Hydrometer Reading
h

L - Effective Depth, derived from table #2

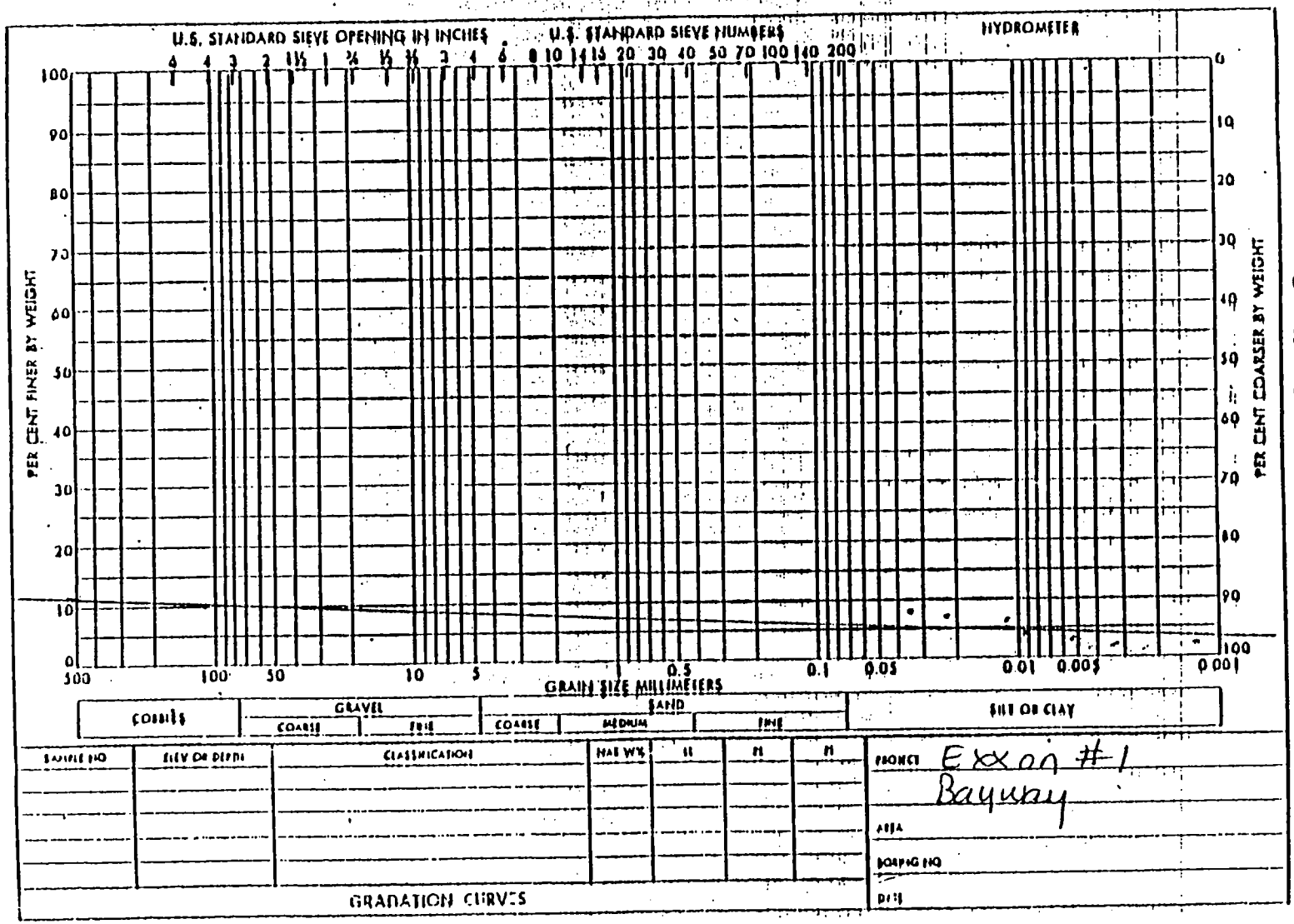
Z - Z suspended (prog. #1): input f M, then each R h

GS - Grain Size (prog. #2): input T and L

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$$y = m.Ln(x) + b.$$

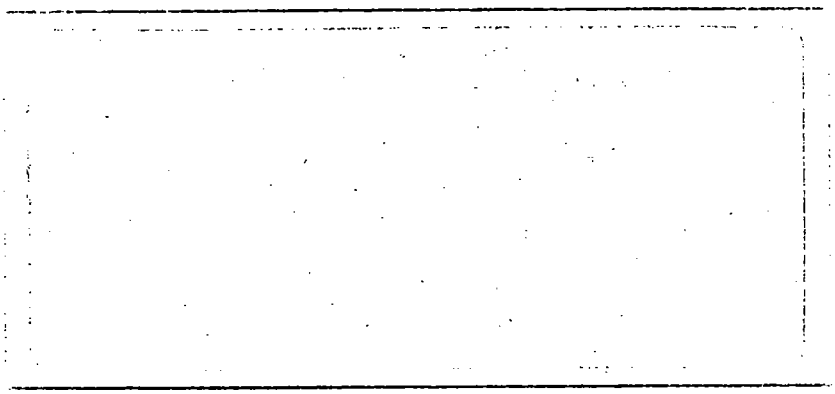
Sand $\geq$ 0,0625 0,0039 $\leq$ Silt $<$ 0,0625 Clay $\geq$ 0,0039



Clay- 4.12%

Silt- 3.98%

Sand- 91.9%



TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

box 1518 □ 60 seaview blvd., port washington, ny 11050 □ (516) 625-5500 □ fax (516) 625-1274

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

Project No.: 9016673

Log In No: 3871

P.O. No.: Pending

Date: March 28, 1990

ANALYTICAL DATA REPORT PACKAGE
FOR

Exxon, USA

1400 Park Avenue

Linden, N.J. 07036

Attn: R.A. Greaux

SAMPLE IDENTIFICATION	LABORATORY NUMBER	TYPE OF SAMPLE	DATE AND TIME OF SAMPLE COLLECTION

SEE NEXT PAGE

REPORT PREPARED BY:
PARAG K. SHAH, Ph. D.
ORGANIC LAB. MANAGER

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

DOUGLAS SHEELEY
LABORATORY DIRECTOR

REMO GIGANTE
EXECUTIVE V.P.

N.J. Cert. # 73469

dr

Report on sample(s) furnished by client applies to sample(s). Report on sample(s) obtained by us applies only to lot sampled. Information contained herein is not to be used for reproduction except by special permission. Sample(s) will be retained for thirty days maximum after date of report unless specifically requested otherwise by client. In the event that there are portions or parts of sample(s) remaining after Nytest has completed the required tests, Nytest shall have the option of returning such sample(s) to the client at the client's expense.

nytest environmental inc.

Project No.: 9016673
Log In No: 3871

SAMPLE IDENTIFICATION	LABORATORY NUMBER	TYPE OF SAMPLE	DATE AND TIME OF SAMPLE COLLECTION
LOC-1	3871001	SEDIMENTS	2/9/90
LOC-2	3871002	SEDIMENTS	2/9/90
LOC-3	3871003	SEDIMENTS	2/9/90
LOC-4	3871004	SEDIMENTS	2/9/90
LOC-5	3871005	SEDIMENTS	2/9/90
LOC-6	3871006	SEDIMENTS	2/9/90
LOC-7	3871007	SEDIMENTS	2/9/90
LOC-8	3871008	SEDIMENTS	2/9/90
LOC-9	3871009	SEDIMENTS	2/9/90
LOC-10	3871010	SEDIMENTS	2/9/90
LOC-11	3871011	SEDIMENTS	2/9/90
LOC-12	3871012	SEDIMENTS	2/9/90
LOC-1EL	71001EL	ELUTRIATES	2/9/90
LOC-2EL	71002EL	ELUTRIATES	2/9/90
LOC-3EL	71003EL	ELUTRIATES	2/9/90
LOC-4EL	71004EL	ELUTRIATES	2/9/90
LOC-5EL	71005EL	ELUTRIATES	2/9/90
LOC-6EL	71006EL	ELUTRIATES	2/9/90
LOC-7EL	71007EL	ELUTRIATES	2/9/90
LOC-8EL	71008EL	ELUTRIATES	2/9/90
LOC-9EL	71009EL	ELUTRIATES	2/9/90
LOC-10EL	71010EL	ELUTRIATES	2/9/90
LOC-11EL	71011EL	ELUTRIATES	2/9/90
LOC-12EL	71012EL	ELUTRIATES	2/9/90

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TOTAL ANALYTICAL SERV. FOR A SAFE ENVIRONMENT

nytest environmental inc

CHAIN OF CUSTODY RECORD

Page ____ of ____

SHIP TO: Nytest Environmental Inc.
60 Seaview Blvd.
Port Washington, NY 11050
(516) 625-5500
Attn. ____

REPORT TO: Client Name EXXON
Address 1400 PARK AVE
LINDEN NJ 07036
Phone ____
Attn. R.A. GREANY

Project No.	Project Name	Date Shipped	Carrier
Sampler: (Signature)	Analytical Protocol	Air Bill No.	Cooler No.

Sample I.D.	Date/Time Sampled	Sample Description	No. Of Containers	ANALYSIS REQUESTED
LOC-1	2/9	SEDIMENT	1	GR. SIZE ARMY
				BULK SED
↓			↓	2,3,7,8 TCDD
LOC-12	2/9		12	NJ WATER QUALITY
DMP 1				BIO/BIOACRF, BN/SED BIOA
LOC-12	2/9		1	BIOAS/BIOACC, ELUT, SITE WATER

Relinquished by (Signature)	Date / Time	Rec'd. By (Signature)	Date / Time
Print Name		Print Name	
Relinquished by (Signature)	Date / Time	Rec'd. by (Signature)	Date / Time
Print Name		Print Name	
Relinquished by (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time
Print Name		Print Name CHRISTINE SUPPLE	2/13

Special Instructions/Comments ____

Client Retains Yellow Copy Only

00001

Laboratory Chronicle

Project No: 9016673

Client Name: Exxon, USA

Date Received: 2/13/90
Sample ID: LCC-1→ LCC-12

Organics Extraction:

1. Acids 2/20/90
2. Base/Neutrals 2/20/90
3. Pesticides/PCBs
4. Dioxin

Analysis:

1. Volatiles
2. Acids 3/16/90→3/18/90
3. Base/Neutrals 3/6/90, 3/20/90, 3/21/90
4. Pesticides/PCBs
5. Dioxin

Section Supervisor
Review & Approval

Inorganics:

1. Metals
2. Cyanides
3. Phenols

Other Analysis:

Section Supervisor
Review & Approval

Quality Control Supervisor
Review & Approval

If fractions are re-extracted and re-analyzed include dates for both.

nytest environmental inc.

NON-CONFORMANCE SUMMARY
(Case Narrative)

Project Number: 9016673
Log In No.: 3871

GENERAL COMMENTS:

Sampling was performed by NEI on 2/9/90. Tissue analysis and elutriate/ sitewater analysis in triplicate results will follow under separate cover. Enclosed in this data package are results for bulk sediments and elutriates: LCC-1 thru LCC-12.

BASE NEUTRAL ANALYSIS:

Due to the viscosity of sample extracts most bulk sediments were analyzed at small dilutions. The elutriates for LCC-1→ LCC-9 were extracted from an initial volume of 500mls. The dilution factor and detection limits reflect this.

PESTICIDE/PCB ANALYSIS:

Samples were analyzed as per required protocol, no problems were encountered.

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METHODOLOGY SUMMARY

AQUEOUS SAMPLE PREPARATION	REFERENCE 1	REFERENCE 2
BNA, Pesticides/PCB's Extraction		3510
AA/ICP Sample Preparation	200.7	
Furnace Sample Preparation	200.0	
Mercury Sample Preparation	245.1	
Hexavalent Chromium Sample Preparation	218.5	
NON-AQUEOUS EXTRACTIONS		
SOIL AND SEDIMENT SAMPLES:		
BNA, Pesticides/PCB's Extraction		3550
AA/ICP Sample Preparation	3050	
Furnace Sample Preparation	3050	
Mercury Sample Preparation	7471	
SLUDGE/PETROLEUM BASED SAMPLES:		
AA/ICP Sample Preparation		3050
Furnace Sample Preparation		3020/3030/3050
Mercury Sample Preparation		7471
ICP (INDUCTIVELY COUPLED PLASMA):		
Aluminum	200.7	6010
Antimony	200.7	6010
Barium	200.7	6010
Beryllium	200.7	6010
Cadmium	200.7	6010
Calcium	200.7	6010
Chromium	200.7	6010
Cobalt	200.7	6010
Copper	200.7	6010
Iron	200.7	6010
Lead	200.7	6010
Magnesium	200.7	6010
Manganese	200.7	6010
Molybdenum	200.7	6010
Nickel	200.7	6010
Potassium	200.7	6010
Silver	200.7	6010
Sodium	200.7	6010
Tin	200.7	6010
Titanium	200.7	6010
Vanadium	200.7	6010
Zinc	200.7	6010

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METHODOLOGY SUMMARY

FURNACE AA:	REFERENCE 1	REFERENCE 2	REFERENCE 3
Antimony	204.1	7041	
Arsenic	206.2	7060	
Lead	239.2	7421	
Selenium	270.2	7740	
Thallium	279.2	7841	
Tin	282.2		
Vanadium	286.2	7911	
Mercury	245.1	7470	

AQUEOUS METHODOLOGIES:	
Organochlorine Pesticides and PCB's by Gas Chromatography	608
Herbicides by Gas Chromatography	362
Purgeable Organics by GC/MS	624
Base/Neutral, Acids by GC/MS	625
2,3,7,8-TCDD by GC/MS	613/625

NON-AQUEOUS METHODOLOGIES:	
Gas Chromatography/Mass Spectrometry:	
Purgeable Organics	8240
Base/Neutral and Acid Extractables	8270
Organochlorine Pesticides and PCB's by Gas Chromatography	8080

MISCELLANEOUS ANALYSIS:	
Extraction Procedure Toxicity	1310
Ignitability	1010
Corrosivity	1110
Reactivity	Chapter 8.3
Toxicity Characteristic Leaching Procedure (TCLP)	(Reference 5)

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METHODOLOGY SUMMARY

ADDITIONAL INORGANIC PARAMETERS	REFERENCE 1	REFERENCE 2
Bromide	320.1	
Color	110.2	
Conductance	120.1	
Conductance		9050
Odor	140.1	
pH	150.1	
pH		9040
TDS	160.2	
TSS	160.2	-
TS	160.3	
Hardness	130.1	
Temperature	170.1	
Turbidity	180.1	
Acidity	305.1	
Alkalinity	310.1	
Ammonia	350.2/350.3	
Chloride	325.3	
Chloride		9252
Residual Chlorine	330.2	
COD	410.3/405.1	
Cyanide	335.3	
Oil and Grease	413.1/413.2	
Oil and Grease		9070
Fluoride	340.2	
TKN	351.2	
NO2/NO3	353.2	
D.O.	360.2	
Petroleum Hydrocarbons (Reference 4)	418.1	
Phenol	420.2	
Phosphorous	365.1	
Silica	370.1	
Sulfate	375.2/375.4	
Sulfide	376.1	
Surfactants	425.1	
TOC	415.1	

REFERENCES:

(1) USEPA-600/4-79-002, Methods for Chemical Analysis of Water and Waste
(2) USEPA SW 846, Test Methods for Evaluating Solid Waste, Third Edition
(3) Federal Register 40 CFR Part 136, Vol. 49, No. 209 Test Parameters for the Analysis of Pollutants
(4) as modified by NJDEP-BISE (for non-aqueous samples)
(5) Federal Register Vol. 51, No. 216 Friday, 11/7/86, pp. 40643-40652

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DATA REPORTING QUALIFIERS

U Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected. The number is the minimum attainable detected limit for the sample.

J Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g.: If limit of detection is 10 ug/l and a concentration of 3 ug/l is calculated, report as 3J.)

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

T This flag indentifies all targeted compounds that were found above the method detection limits.

NA This flag indicates that the data is not applicable

Note: Data on soil samples expressed on a dry weight basis.

nytest environmental inc.

REPORT OF ANALYSIS

Project No.:9016673
Log In #:3871

We find as follows:

Results in mg/kg (dry wt. basis)

Parameter(s)	Sample Identification: BULK SEDIMENTS					
	CORE #1	CORE #2	CORE #3	CORE #4	CORE #5	CORE #6
Arsenic	9.8	12.3	26.8	16.9	18.4	13.9
Cadmium	1.5	1.0	2.6	4.1	8.8	1.4
romium	151	144	183	193	238	141
Nickel	43.7	41.5	39.4	49.2	54.0	40.9
Copper	302	287	345	410	549	134
Mercury	2.1	1.3	1.8	3.7	0.7	1.5
Lead	223	214	278	29	319	214
Zinc	384	3.49	391	463	579	344
Total Phenols	2.4	<1.0	<1.0	5.3	<1.0	<1.0
Oil & Grease	11200	9710	6190	9440	12300	11200
Total Petroleum Hydrocarbons	5790	7160	5900	7390	9410	4510

nytest environmental inc.

REPORT OF ANALYSIS

Project No.:9016673
Log In #:3871

We find as follows:

Results in mg/kg (dry wt. basis)

Parameter(s)	Sample Identification						
	BULK SEDIMENTS						
	CORE #7	CORE #8	CORE #9	CORE #10	CORE #11	CORE #12	METHOD BLANK
Arsenic	17.3	15.3	15.1	12.8	13.0	16.5	<1.0
Cadmium	3.0	1.4	1.9	2.4	3.1	1.8	<1.0
:romium	180	143	153	156	163	156	<2.0
Nickel	44.4	41.0	41.1	43.7	45.3	41.6	<2.0
Copper	379	280	304	327	347	309	<1.0
Mercury	2.3	1.7	2.9	1.8	1.2	2.3	<0.02
Lead	264	214	228	237	280	238	<5.0
Zinc	434	359	366	378	421	389	<2.0
Total Phenols	<1.0	4.4	<1.0	<1.0	<1.0	1.6	<1.0
Oil & Grease	6850	9640	5520	7480	21500	5080	<10
Total Petroleum Hydrocarbons	6050	4510	4920	5690	1320	4030	<10

nytest environmental inc.

REPORT OF ANALYSIS

Project No.:9016673
Log In #:3871

We find as follows:

Results in mg/l

Parameter(s)	Sample Identification: ELUTRIATES					
	EL 1	EL 2	EL 3	EL 4	EL 5	EL 6
Arsenic	<.005	<.005	<.005	<.005	<.005	<.005
Cadmium	<.005	<.005	<.005	<.005	<.005	<.005
:omium	<.005	<.005	<.005	<.005	<.005	<.005
Nickel	<.020	<.020	<.020	<.020	<.020	<.020
Copper	<.010	<.010	0.011	<.010	<.010	0.013
Mercury	<.0002	<.0002	<.0002	<.0002	<.0002	<.0002
Lead	<.050	<.050	<.050	<.050	<.050	<.050
Zinc	<.020	<.020	<.020	<.020	<.020	<.020
Total Phenols	0.224	0.126	0.092	0.117	0.120	0.037
Oil & Grease	5.2	7.8	9.2	14.0	10.7	9.8
Total Petroleum Hydrocarbons	1.2	4.5	1.2	1.8	1.3	1.4

nytest environmental inc.

REPORT OF ANALYSIS

Project No.:9016673
Log In #:3871

We find as follows:

Results in mg/l

Parameter(s)	Sample Identification: ELUTRIATES						
	EL 7	EL 8	EL 9	EL 10	EL 11	EL 12	METHOD BLANK
Arsenic	<.005	<.005	<.005	<.005	<.005	<.005	<.005
Cadmium	<.005	<.005	<.005	<.005	<.005	<.005	<.005
romium	<.005	<.005	<.005	<.005	<.005	<.005	<.005
Nickel	<.020	<.020	<.020	<.020	<.020	<.020	<.020
Copper	<.010	<.010	.012	<.010	<.010	<.010	<.010
Mercury	<.0002	<.0002	<.0002	<.0002	<.0002	<.0002	<.0002
Lead	<.050	<.050	<.050	<.050	<.050	<.050	<.050
Zinc	<.020	<.020	<.020	<.020	<.020	<.020	<.020
Total Phenols	0.081	0.021	0.106	0.200	0.090	0.109	<.002
Oil & Grease	6.2	13.2	5.8	8.6	11.6	10.4	<.2
Total Petroleum Hydrocarbons	1.9	1.2	1.0	1.1	1.3	1.1	<.2

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-1
LAB ID: 3871001
DIL FACTOR: 4.90
% MOISTURE: 78

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	6000.0 U.
2	541-73-1	1,3-Dichlorobenzene	6000.0 U.
3	106-46-7	1,4-Dichlorobenzene	6000.0 U.
4	95-50-1	1,2-Dichlorobenzene	6000.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	6000.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	6000.0 U.
7	67-72-1	Hexachloroethane	6000.0 U.
8	98-95-3	Nitrobenzene	6000.0 U.
9	78-59-1	Isophorone	6000.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	6000.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	6000.0 U.
12	106-47-8	4-Chloroaniline	6000.0 U.
13	87-68-3	Hexachlorobutadiene	6000.0 U.
14	91-57-6	2-Methylnaphthalene	6000.0 U.
15	77-47-4	Hexachlorocyclopentadiene	6000.0 U.
16	91-58-7	2-Chloronaphthalene	6000.0 U.
17	88-74-4	2-Nitroaniline	30000.0 U.
18	131-11-3	Dimethyl Phthalate	6000.0 U.
19	99-09-2	3-Nitroaniline	30000.0 U.
20	132-64-9	Dibenzofuran	6000.0 U.
21	121-14-2	2,4-Dinitrotoluene	6000.0 U.
22	606-20-2	2,6-Dinitrotoluene	6000.0 U.
23	84-66-2	Diethylphthalate	6000.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	6000.0 U.
25	100-01-6	4-Nitroaniline	30000.0 U.
26	86-30-6	N-Nitrosodiphenylamine	6000.0 U.
27	101-55-3	4-Bromophenyl-phenylether	6000.0 U.
28	118-74-1	Hexachlorobenzene	6000.0 U.
29	84-74-2	Di-n-Butylphthalate	13000.0 T.
30	85-68-7	Butylbenzylphthalate	6000.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	12000.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	13000.0 TB
33	11734-0	Di-n-Octyl Phthalate	6000.0 U.
34	62-75-9	N-Nitrosodimethylamine	6000.0 U.
35	62-53-3	Aniline	6000.0 U.
36	92-87-5	Benzidine	48000.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	6000.0 U.
43	208-96-8	Acenaphthylene	6000.0 U.
44	83-32-9	Acenaphthene	6000.0 U.
45	86-73-7	Fluorene	6000.0 U.
46	85-01-8	Phenanthrene	1400.0 J.
47	120-12-7	Anthracene	6000.0 U.
48	206-44-0	Fluoranthene	1100.0 J.
49	129-00-0	Pyrene	6000.0 U.
50	56-55-3	Benzo(a)Anthracene	6000.0 U.
51	218-01-9	Chrysene	6000.0 U.
52	205-99-2	Benzo(b)Fluoranthene	6000.0 U.
53	207-08-9	Benzo(k)Fluoranthene	6000.0 U.
54	50-32-8	Benzo(a)Pyrene	6000.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	6000.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	6000.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	6000.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-1
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871001
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	78

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	81.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	170.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	350.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	360.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	360.000 U.
21	11104-28-2	Aroclor-1221	360.000 U.
22	11141-16-5	Aroclor-1232	360.000 U.
23	53469-21-9	Aroclor-1242	360.000 U.
24	12672-29-6	Aroclor-1248	360.000 U.
25	11097-69-1	Aroclor-1254	730.000 U.
26	11096-82-5	Aroclor-1260	730.000 U.

MYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-2
LAB ID: 3871002
DIL FACTOR: 2.00
% MOISTURE: 90

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	3300.0 U.
2	541-73-1	1,3-Dichlorobenzene	3300.0 U.
3	106-46-7	1,4-Dichlorobenzene	3300.0 U.
4	95-50-1	1,2-Dichlorobenzene	3300.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	3300.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	3300.0 U.
7	67-72-1	Hexachloroethane	3300.0 U.
8	98-95-3	Nitrobenzene	3300.0 U.
9	78-59-1	Isophorone	3300.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	3300.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	3300.0 U.
12	106-47-8	4-Chloroaniline	3300.0 U.
13	87-68-3	Hexachlorobutadiene	3300.0 U.
14	91-57-6	2-Methylnaphthalene	550.0 J.
15	77-47-4	Hexachlorocyclopentadiene	3300.0 U.
16	91-58-7	2-Chloronaphthalene	3300.0 U.
17	88-74-4	2-Nitroaniline	16500.0 U.
18	131-11-3	Dimethyl Phthalate	3300.0 U.
19	99-09-2	3-Nitroaniline	16500.0 U.
20	132-64-9	Dibenzofuran	3300.0 U.
21	121-14-2	2,4-Dinitrotoluene	3300.0 U.
22	606-20-2	2,6-Dinitrotoluene	3300.0 U.
23	84-66-2	Diethylphthalate	3300.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	3300.0 U.
25	100-01-6	4-Nitroaniline	16500.0 U.
26	86-30-6	N-Nitrosodiphenylamine	3300.0 U.
27	101-55-3	4-Bromophenyl-phenylether	3300.0 U.
28	118-74-1	Hexachlorobenzene	3300.0 U.
29	84-74-2	Di-n-Butylphthalate	12000.0 T.
30	85-68-7	Butylbenzylphthalate	3300.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	6600.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	5300.0 TB
33	11784-0	Di-n-Octyl Phthalate	3300.0 U.
34	62-75-9	N-Nitrosodimethylamine	3300.0 U.
35	62-53-3	Aniline	3300.0 U.
36	92-87-5	Benzidine	25400.0 U.
37		Dioxin (Screen)	ND .
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	3300.0 U.
43	208-96-8	Acenaphthylene	3300.0 U.
44	83-32-9	Acenaphthene	3300.0 U.
45	86-73-7	Fluorene	3300.0 U.
46	85-01-8	Phenanthrene	580.0 J.
47	120-12-7	Anthracene	3300.0 U.
48	206-44-0	Fluoranthene	640.0 J.
49	129-00-0	Pyrene	770.0 J.
50	56-55-3	Benzo(a)Anthracene	3300.0 U.
51	218-01-9	Chrysene	3300.0 U.
52	205-99-2	Benzo(b)Fluoranthene	3300.0 U.
53	207-08-9	Benzo(k)Fluoranthene	3300.0 U.
54	50-32-8	Benzo(a)Pyrene	3300.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	3300.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	3300.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	3300.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 O-T
NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-2
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871002
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	80

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	140.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	340.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	690.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	400.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	400.000 U.
21	11104-28-2	Aroclor-1221	400.000 U.
22	11141-16-5	Aroclor-1232	400.000 U.
23	53469-21-9	Aroclor-1242	400.000 U.
24	12672-29-6	Aroclor-1248	400.000 U.
25	11097-69-1	Aroclor-1254	800.000 U.
26	11096-82-5	Aroclor-1260	800.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-3
LAB ID: 3871003
DIL FACTOR: 2.00
% MOISTURE: 75

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	2640.0 U.
2	541-73-1	1,3-Dichlorobenzene	2640.0 U.
3	106-46-7	1,4-Dichlorobenzene	2640.0 U.
4	95-50-1	1,2-Dichlorobenzene	2640.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	2640.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	2640.0 U.
7	67-72-1	Hexachloroethane	2640.0 U.
8	98-95-3	Nitrobenzene	2640.0 U.
9	78-59-1	Isophorone	2640.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	2640.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	2640.0 U.
12	106-47-8	4-Chloroaniline	2640.0 U.
13	87-68-3	Hexachlorobutadiene	2640.0 U.
14	91-57-6	2-Methylnaphthalene	2640.0 U.
15	77-47-4	Hexachlorocyclopentadiene	2640.0 U.
16	91-58-7	2-Chloronaphthalene	2640.0 U.
17	88-74-4	2-Nitroaniline	13200.0 U.
18	131-11-3	Dimethyl Phthalate	2640.0 U.
19	99-09-2	3-Nitroaniline	13200.0 U.
20	132-64-9	Dibenzofuran	2640.0 U.
21	121-14-2	2,4-Dinitrotoluene	2640.0 U.
22	606-20-2	2,6-Dinitrotoluene	2640.0 U.
23	84-66-2	Diethylphthalate	2640.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	2640.0 U.
25	100-01-6	4-Nitroaniline	13200.0 U.
26	86-30-6	N-Nitrosodiphenylamine	2640.0 U.
27	101-55-3	4-Bromophenyl-phenylether	2640.0 U.
28	118-74-1	Hexachlorobenzene	2640.0 U.
29	84-74-2	Di-n-Butylphthalate	9400.0 T.
30	85-68-7	Butylbenzylphthalate	1100.0 J.
31	91-94-1	3,3'-Dichlorobenzidine	5280.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	5600.0 TB
33	11784-0	Di-n-Octyl Phthalate	2640.0 U.
34	62-75-9	N-Nitrosodimethylamine	2640.0 U.
35	62-53-3	Aniline	2640.0 U.
36	92-87-5	Benzidine	21120.0 U.
37		Dioxin (Screen)	ND
38			
39			
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41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	2640.0 U.
43	208-96-8	Acenaphthylene	2640.0 U.
44	83-32-9	Acenaphthene	2640.0 U.
45	86-73-7	Fluorene	2640.0 U.
46	85-01-8	Phenanthrene	510.0 J.
47	120-12-7	Anthracene	2640.0 U.
48	206-44-0	Fluoranthene	580.0 J.
49	129-00-0	Pyrene	720.0 J.
50	56-55-3	Benzo(a)Anthracene	2640.0 U.
51	218-01-9	Chrysene	2640.0 U.
52	205-99-2	Benzo(b)Fluoranthene	2640.0 U.
53	207-08-9	Benzo(k)Fluoranthene	2640.0 U.
54	50-32-8	Benzo(a)Pyrene	2640.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	2640.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	2640.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	2640.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-3
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871003
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	75

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	64.000 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	260.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	570.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	320.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	320.000 U.
21	11104-28-2	Aroclor-1221	320.000 U.
22	11141-16-5	Aroclor-1232	320.000 U.
23	53469-21-9	Aroclor-1242	320.000 U.
24	12672-29-6	Aroclor-1248	320.000 U.
25	11097-69-1	Aroclor-1254	640.000 U.
26	11096-82-5	Aroclor-1260	640.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-4
LAB ID: 3871004
DIL FACTOR: 2.00
% MOISTURE: 81

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	3470.0 U.
2	541-73-1	1,3-Dichlorobenzene	3470.0 U.
3	106-46-7	1,4-Dichlorobenzene	3470.0 U.
4	95-50-1	1,2-Dichlorobenzene	3470.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	3470.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	3470.0 U.
7	67-72-1	Hexachloroethane	3470.0 U.
8	98-95-3	Nitrobenzene	3470.0 U.
9	78-59-1	Isophorone	3470.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	3470.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	3470.0 U.
12	106-47-8	4-Chloroaniline	3470.0 U.
13	87-68-3	Hexachlorobutadiene	3470.0 U.
14	91-57-6	2-Methylnaphthalene	3470.0 U.
15	77-47-4	Hexachlorocyclopentadiene	3470.0 U.
16	91-58-7	2-Chloronaphthalene	3470.0 U.
17	88-74-4	2-Nitroaniline	17370.0 U.
18	131-11-3	Dimethyl Phthalate	3470.0 U.
19	99-09-2	3-Nitroaniline	17370.0 U.
20	132-64-9	Dibenzofuran	3470.0 U.
21	121-14-2	2,4-Dinitrotoluene	3470.0 U.
22	606-20-2	2,6-Dinitrotoluene	3470.0 U.
23	84-66-2	Diethylphthalate	3470.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	3470.0 U.
25	100-01-6	4-Nitroaniline	17370.0 U.
26	86-30-6	N-Nitrosodiphenylamine	3470.0 U.
27	101-55-3	4-Bromophenyl-phenylether	3470.0 U.
28	118-74-1	Hexachlorobenzene	3470.0 U.
29	84-74-2	Di-n-Butylphthalate	14000.0 T.
30	85-68-7	Butylbenzylphthalate	3470.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	6950.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	5100.0 TB
33	11784-0	Di-n-Octyl Phthalate	3470.0 U.
34	62-75-9	N-Nitrosodimethylamine	3470.0 U.
35	62-53-3	Aniline	3470.0 U.
36	92-87-5	Benzidine	27790.0 U.
37		Dioxin (Screen)	ND .
38			
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CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	3470.0 U.
43	208-96-8	Acenaphthylene	3470.0 U.
44	83-32-9	Acenaphthene	3470.0 U.
45	86-73-7	Fluorene	3470.0 U.
46	85-01-8	Phenanthrene	3470.0 U.
47	120-12-7	Anthracene	3470.0 U.
48	206-44-0	Fluoranthene	550.0 J.
49	129-00-0	Pyrene	470.0 J.
50	56-55-3	Benzo(a)Anthracene	3470.0 U.
51	218-01-9	Chrysene	3470.0 U.
52	205-99-2	Benzo(b)Fluoranthene	3470.0 U.
53	207-08-9	Benzo(k)Fluoranthene	3470.0 U.
54	50-32-8	Benzo(a)Pyrene	3470.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	3470.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	3470.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	3470.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LCC-4
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871004
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	81

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	180.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	230.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	510.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	420.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	420.000 U.
21	11104-28-2	Aroclor-1221	420.000 U.
22	11141-16-5	Aroclor-1232	420.000 U.
23	53469-21-9	Aroclor-1242	420.000 U.
24	12672-29-6	Aroclor-1248	420.000 U.
25	11097-69-1	Aroclor-1254	840.000 U.
26	11096-82-5	Aroclor-1260	840.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LCO-5
LAB ID: 3871005
DIL FACTOR: 1.00
% MOISTURE: 76

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	1380.0 U.
2	541-73-1	1,3-Dichlorobenzene	1380.0 U.
3	106-46-7	1,4-Dichlorobenzene	1380.0 U.
4	95-50-1	1,2-Dichlorobenzene	1380.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	1380.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	1380.0 U.
7	67-72-1	Hexachloroethane	1380.0 U.
8	98-95-3	Nitrobenzene	1380.0 U.
9	78-59-1	Isophorone	1380.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	1380.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	1380.0 U.
12	106-47-8	4-Chloroaniline	1380.0 U.
13	87-68-3	Hexachlorobutadiene	1380.0 U.
14	91-57-6	2-Methylnaphthalene	1380.0 U.
15	77-47-4	Hexachlorocyclopentadiene	1380.0 U.
16	91-58-7	2-Chloronaphthalene	1380.0 U.
17	88-74-4	2-Nitroaniline	6880.0 U.
18	131-11-3	Dimethyl Phthalate	1380.0 U.
19	99-09-2	3-Nitroaniline	6880.0 U.
20	132-64-9	Dibenzofuran	1380.0 U.
21	121-14-2	2,4-Dinitrotoluene	1380.0 U.
22	606-20-2	2,6-Dinitrotoluene	1380.0 U.
23	84-66-2	Diethylphthalate	1380.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	1380.0 U.
25	100-01-6	4-Nitroaniline	6880.0 U.
26	86-30-6	N-Nitrosodiphenylamine	1380.0 U.
27	101-55-3	4-Bromophenyl-phenylether	1380.0 U.
28	118-74-1	Hexachlorobenzene	1380.0 U.
29	84-74-2	Di-n-Butylphthalate	10000.0 T.
30	85-68-7	Butylbenzylphthalate	310.0 J.
31	91-94-1	3,3'-Dichlorobenzidine	2750.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	4400.0 TB
33	11784-0	Di-n-Octyl Phthalate	1380.0 U.
34	62-75-9	N-Nitrosodimethylamine	1380.0 U.
35	62-53-3	Aniline	1380.0 U.
36	92-87-5	Benzidine	11000.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	1380.0 U.
43	208-96-8	Acenaphthylene	1380.0 U.
44	83-32-9	Acenaphthene	1380.0 U.
45	86-73-7	Fluorene	1380.0 U.
46	85-01-8	Phenanthrene	1380.0 U.
47	120-12-7	Anthracene	1380.0 U.
48	206-44-0	Fluoranthene	270.0 J.
49	129-00-0	Pyrene	220.0 J.
50	56-55-3	Benzo(a)Anthracene	1380.0 U.
51	218-01-9	Chrysene	1380.0 U.
52	205-99-2	Benzo(b)Fluoranthene	1380.0 U.
53	207-08-9	Benzo(k)Fluoranthene	1380.0 U.
54	50-32-8	Benzo(a)Pyrene	1380.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	1380.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	1380.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	1380.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-5
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871005
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	76

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	80.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	140.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	550.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	330.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	330.000 U.
21	11104-28-2	Aroclor-1221	330.000 U.
22	11141-16-5	Aroclor-1232	330.000 U.
23	53469-21-9	Aroclor-1242	330.000 U.
24	12672-29-6	Aroclor-1248	330.000 U.
25	11097-69-1	Aroclor-1254	670.000 U.
26	11096-82-5	Aroclor-1260	670.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-6
LAB ID: 3871006
DIL FACTOR: 2.00
% MOISTURE: 80

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	3300.0 U.
2	541-73-1	1,3-Dichlorobenzene	3300.0 U.
3	106-46-7	1,4-Dichlorobenzene	3300.0 U.
4	95-50-1	1,2-Dichlorobenzene	3300.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	3300.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	3300.0 U.
7	67-72-1	Hexachloroethane	3300.0 U.
8	98-95-3	Nitrobenzene	3300.0 U.
9	78-59-1	Isophorone	3300.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	3300.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	3300.0 U.
12	106-47-8	4-Chloroaniline	3300.0 U.
13	87-68-3	Hexachlorobutadiene	3300.0 U.
14	91-57-6	2-Methylnaphthalene	3300.0 U.
15	77-47-4	Hexachlorocyclopentadiene	3300.0 U.
16	91-58-7	2-Chloronaphthalene	3300.0 U.
17	88-74-4	2-Nitroaniline	16500.0 U.
18	131-11-3	Dimethyl Phthalate	3300.0 U.
19	99-09-2	3-Nitroaniline	16500.0 U.
20	132-64-9	Dibenzofuran	3300.0 U.
21	121-14-2	2,4-Dinitrotoluene	3300.0 U.
22	606-20-2	2,6-Dinitrotoluene	3300.0 U.
23	84-66-2	Diethylphthalate	3300.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	3300.0 U.
25	100-01-6	4-Nitroaniline	16500.0 U.
26	86-30-6	N-Nitrosodiphenylamine	3300.0 U.
27	101-55-3	4-Bromophenyl-phenylether	3300.0 U.
28	118-74-1	Hexachlorobenzene	3300.0 U.
29	84-74-2	Di-n-Butylphthalate	10000.0 T.
30	85-68-7	Butylbenzylphthalate	3300.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	6600.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	4000.0 TB
33	11784-0	Di-n-Octyl Phthalate	3300.0 U.
34	62-75-9	N-Nitrosodimethylamine	3300.0 U.
35	62-53-3	Aniline	3300.0 U.
36	92-87-5	Benzidine	26400.0 U.
37		Dioxin (Screen)	ND
38			
39			
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41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	3300.0 U.
43	208-96-8	Acenaphthylene	3300.0 U.
44	83-32-9	Acenaphthene	3300.0 U.
45	86-73-7	Fluorene	3300.0 U.
46	85-01-8	Phenanthrene	3300.0 U.
47	120-12-7	Anthracene	3300.0 U.
48	206-44-0	Fluoranthene	390.0 J.
49	129-00-0	Pyrene	170.0 J.
50	56-55-3	Benzo(a)Anthracene	3300.0 U.
51	218-01-9	Chrysene	3300.0 U.
52	205-99-2	Benzo(b)Fluoranthene	3300.0 U.
53	207-08-9	Benzo(k)Fluoranthene	3300.0 U.
54	50-32-8	Benzo(a)Pyrene	3300.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	3300.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	3300.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	3300.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LCC-6
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871006
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	80

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	150.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	230.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	620.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	400.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	400.000 U.
21	11104-28-2	Aroclor-1221	400.000 U.
22	11141-16-5	Aroclor-1232	400.000 U.
23	53469-21-9	Aroclor-1242	400.000 U.
24	12672-29-6	Aroclor-1248	400.000 U.
25	11097-69-1	Aroclor-1254	800.000 U.
26	11096-82-5	Aroclor-1260	800.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-7
LAB ID: 3871007
DIL FACTOR: 1.00
% MOISTURE: 74

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	1270.0 U.
2	541-73-1	1,3-Dichlorobenzene	1270.0 U.
3	106-46-7	1,4-Dichlorobenzene	1270.0 U.
4	95-50-1	1,2-Dichlorobenzene	1270.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	1270.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	1270.0 U.
7	67-72-1	Hexachloroethane	1270.0 U.
8	98-95-3	Nitrobenzene	1270.0 U.
9	78-59-1	Isophorone	1270.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	1270.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	1270.0 U.
12	106-47-8	4-Chloroaniline	1270.0 U.
13	87-68-3	Hexachlorobutadiene	1270.0 U.
14	91-57-6	2-Methylnaphthalene	1270.0 U.
15	77-47-4	Hexachlorocyclopentadiene	1270.0 U.
16	91-58-7	2-Chloronaphthalene	1270.0 U.
17	88-74-4	2-Nitroaniline	6350.0 U.
18	131-11-3	Dimethyl Phthalate	1270.0 U.
19	99-09-2	3-Nitroaniline	6350.0 U.
20	132-64-9	Dibenzofuran	1270.0 U.
21	121-14-2	2,4-Dinitrotoluene	1270.0 U.
22	606-20-2	2,6-Dinitrotoluene	1270.0 U.
23	84-66-2	Diethylphthalate	1270.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	1270.0 U.
25	100-01-6	4-Nitroaniline	6350.0 U.
26	86-30-6	N-Nitrosodiphenylamine	1270.0 U.
27	101-55-3	4-Bromophenyl-phenylether	1270.0 U.
28	118-74-1	Hexachlorobenzene	1270.0 U.
29	84-74-2	Di-n-Butylphthalate	8200.0 T.
30	85-68-7	Butylbenzylphthalate	540.0 J.
31	91-94-1	3,3'-Dichlorobenzidine	2540.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	4100.0 TB
33	11784-0	Di-n-Octyl Phthalate	1270.0 U.
34	62-75-9	N-Nitrosodimethylamine	1270.0 U.
35	62-53-3	Aniline	1270.0 U.
36	92-87-5	Benzidine	10150.0 U.
37		Dioxin (Screen)	ND
38			
39			
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41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	1270.0 U.
43	208-96-8	Acenaphthylene	1270.0 U.
44	83-32-9	Acenaphthene	1270.0 U.
45	86-73-7	Fluorene	1270.0 U.
46	85-01-8	Phenanthrene	1270.0 U.
47	120-12-7	Anthracene	1270.0 U.
48	206-44-0	Fluoranthene	160.0 J.
49	129-00-0	Pyrene	100.0 J.
50	56-55-3	Benzo(a)Anthracene	1270.0 U.
51	218-01-9	Chrysene	1270.0 U.
52	205-99-2	Benzo(b)Fluoranthene	1270.0 U.
53	207-08-9	Benzo(k)Fluoranthene	1270.0 U.
54	50-32-8	Benzo(a)Pyrene	1270.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	1270.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	1270.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	1270.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LCC-7
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871007
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	74

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	71.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	96.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	350.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	310.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	310.000 U.
21	11104-28-2	Aroclor-1221	310.000 U.
22	11141-16-5	Aroclor-1232	310.000 U.
23	53469-21-9	Aroclor-1242	310.000 U.
24	12672-29-6	Aroclor-1248	310.000 U.
25	11097-69-1	Aroclor-1254	620.000 U.
26	11096-82-5	Aroclor-1260	620.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-8
LAB ID: 3871008
DIL FACTOR: 5.00
% MOISTURE: 73

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	6110.0 U.
2	541-73-1	1,3-Dichlorobenzene	6110.0 U.
3	106-46-7	1,4-Dichlorobenzene	6110.0 U.
4	95-50-1	1,2-Dichlorobenzene	6110.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	6110.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	6110.0 U.
7	67-72-1	Hexachloroethane	6110.0 U.
8	98-95-3	Nitrobenzene	6110.0 U.
9	78-59-1	Isophorone	6110.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	6110.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	6110.0 U.
12	106-47-8	4-Chloroaniline	6110.0 U.
13	87-68-3	Hexachlorobutadiene	6110.0 U.
14	91-57-6	2-Methylnaphthalene	6110.0 U.
15	77-47-4	Hexachlorocyclopentadiene	6110.0 U.
16	91-58-7	2-Chloronaphthalene	6110.0 U.
17	88-74-4	2-Nitroaniline	30560.0 U.
18	131-11-3	Dimethyl Phthalate	6110.0 U.
19	99-09-2	3-Nitroaniline	30560.0 U.
20	132-64-9	Dibenzofuran	6110.0 U.
21	121-14-2	2,4-Dinitrotoluene	6110.0 U.
22	606-20-2	2,6-Dinitrotoluene	6110.0 U.
23	84-66-2	Diethylphthalate	6110.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	6110.0 U.
25	100-01-6	4-Nitroaniline	30560.0 U.
26	86-30-6	N-Nitrosodiphenylamine	6110.0 U.
27	101-55-3	4-Bromophenyl-phenylether	6110.0 U.
28	118-74-1	Hexachlorobenzene	6110.0 U.
29	84-74-2	Di-n-Butylphthalate	17000.0 T.
30	85-68-7	Butylbenzylphthalate	6110.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	12220.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	11000.0 TB
33	11784-0	Di-n-Octyl Phthalate	6110.0 U.
34	62-75-9	N-Nitrosodimethylamine	6110.0 U.
35	62-53-3	Aniline	6110.0 U.
36	92-87-5	Benzidine	48890.0 U.
37		Dioxin (Screen)	ND .
38			
39			
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41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	6110.0 U.
43	208-96-8	Acenaphthylene	6110.0 U.
44	83-32-9	Acenaphthene	6110.0 U.
45	86-73-7	Fluorene	6110.0 U.
46	85-01-8	Phenanthrene	6110.0 U.
47	120-12-7	Anthracene	6110.0 U.
48	206-44-0	Fluoranthene	790.0 J.
49	129-00-0	Pyrene	660.0 J.
50	56-55-3	Benzo(a)Anthracene	6110.0 U.
51	218-01-9	Chrysene	6110.0 U.
52	205-99-2	Benzo(b)Fluoranthene	6110.0 U.
53	207-08-9	Benzo(k)Fluoranthene	6110.0 U.
54	50-32-8	Benzo(a)Pyrene	6110.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	6110.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	6110.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	6110.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

00026

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-8
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871008
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	73

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	99.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	250.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	470.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	300.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	300.000 U.
21	11104-28-2	Aroclor-1221	300.000 U.
22	11141-16-5	Aroclor-1232	300.000 U.
23	53469-21-9	Aroclor-1242	300.000 U.
24	12672-29-6	Aroclor-1248	300.000 U.
25	11097-69-1	Aroclor-1254	590.000 U.
26	11096-82-5	Aroclor-1260	590.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LCC-9
LAB ID: 3871009
DIL FACTOR: 5.00
% MOISTURE: 69

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	5320.0 U.
2	541-73-1	1,3-Dichlorobenzene	5320.0 U.
3	106-46-7	1,4-Dichlorobenzene	5320.0 U.
4	95-50-1	1,2-Dichlorobenzene	5320.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	5320.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	5320.0 U.
7	67-72-1	Hexachloroethane	5320.0 U.
8	98-95-3	Nitrobenzene	5320.0 U.
9	78-59-1	Isophorone	5320.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	5320.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	5320.0 U.
12	106-47-8	4-Chloroaniline	5320.0 U.
13	87-68-3	Hexachlorobutadiene	5320.0 U.
14	91-57-6	2-Methylnaphthalene	5320.0 U.
15	77-47-4	Hexachlorocyclopentadiene	5320.0 U.
16	91-58-7	2-Chloronaphthalene	5320.0 U.
17	88-74-4	2-Nitroaniline	26610.0 U.
18	131-11-3	Dimethyl Phthalate	5320.0 U.
19	99-09-2	3-Nitroaniline	26610.0 U.
20	132-64-9	Dibenzofuran	5320.0 U.
21	121-14-2	2,4-Dinitrotoluene	5320.0 U.
22	606-20-2	2,6-Dinitrotoluene	5320.0 U.
23	84-66-2	Diethylphthalate	5320.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	5320.0 U.
25	100-01-6	4-Nitroaniline	26610.0 U.
26	86-30-6	N-Nitrosodiphenylamine	5320.0 U.
27	101-55-3	4-Bromophenyl-phenylether	5320.0 U.
28	118-74-1	Hexachlorobenzene	5320.0 U.
29	84-74-2	Di-n-Butylphthalate	14000.0 T.
30	85-68-7	Butylbenzylphthalate	5320.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	10650.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	14000.0 TB
33	11784-0	Di-n-Octyl Phthalate	5320.0 U.
34	62-75-9	N-Nitrosodimethylamine	5320.0 U.
35	62-53-3	Aniline	5320.0 U.
36	92-87-5	Benzidine	42580.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	5320.0 U.
43	208-96-8	Acenaphthylene	5320.0 U.
44	83-32-9	Acenaphthene	5320.0 U.
45	86-73-7	Fluorene	5320.0 U.
46	85-01-8	Phenanthrene	5320.0 U.
47	120-12-7	Anthracene	5320.0 U.
48	206-44-0	Fluoranthene	1200.0 J.
49	129-00-0	Pyrene	1300.0 J.
50	56-55-3	Benzo(a)Anthracene	5320.0 U.
51	218-01-9	Chrysene	5320.0 U.
52	205-99-2	Benzo(b)Fluoranthene	5320.0 U.
53	207-08-9	Benzo(k)Fluoranthene	5320.0 U.
54	50-32-8	Benzo(a)Pyrene	5320.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	5320.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	5320.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	5320.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-9
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871009
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	69

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	95.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	230.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	470.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	260.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	260.000 U.
21	11104-28-2	Aroclor-1221	260.000 U.
22	11141-16-5	Aroclor-1232	260.000 U.
23	53469-21-9	Aroclor-1242	260.000 U.
24	12672-29-6	Aroclor-1248	260.000 U.
25	11097-69-1	Aroclor-1254	520.000 U.
26	11096-82-5	Aroclor-1260	520.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-10
LAB ID: 3871010
DIL FACTOR: 4.00
% MOISTURE: 75

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	5280.0 U.
2	541-73-1	1,3-Dichlorobenzene	5280.0 U.
3	106-46-7	1,4-Dichlorobenzene	5280.0 U.
4	95-50-1	1,2-Dichlorobenzene	5280.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	5280.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	5280.0 U.
7	67-72-1	Hexachloroethane	5280.0 U.
8	98-95-3	Nitrobenzene	5280.0 U.
9	78-59-1	Isophorone	5280.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	5280.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	5280.0 U.
12	106-47-8	4-Chloroaniline	5280.0 U.
13	87-68-3	Hexachlorobutadiene	5280.0 U.
14	91-57-6	2-Methylnaphthalene	5280.0 U.
15	77-47-4	Hexachlorocyclopentadiene	5280.0 U.
16	91-58-7	2-Chloronaphthalene	5280.0 U.
17	88-74-4	2-Nitroaniline	26400.0 U.
18	131-11-3	Dimethyl Phthalate	5280.0 U.
19	99-09-2	3-Nitroaniline	26400.0 U.
20	132-64-9	Dibenzofuran	5280.0 U.
21	121-14-2	2,4-Dinitrotoluene	5280.0 U.
22	606-20-2	2,6-Dinitrotoluene	5280.0 U.
23	84-66-2	Diethylphthalate	5280.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	5280.0 U.
25	100-01-6	4-Nitroaniline	26400.0 U.
26	86-30-6	N-Nitrosodiphenylamine	5280.0 U.
27	101-55-3	4-Bromophenyl-phenylether	5280.0 U.
28	118-74-1	Hexachlorobenzene	5280.0 U.
29	84-74-2	Di-n-Butylphthalate	15000.0 T.
30	85-68-7	Butylbenzylphthalate	5280.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	10560.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	12000.0 TB
33	11784-0	Di-n-Octyl Phthalate	5280.0 U.
34	62-75-9	N-Nitrosodimethylamine	5280.0 U.
35	62-53-3	Aniline	5280.0 U.
36	92-87-5	Benzidine	42240.0 U.
37		Dioxin (Screen)	ND
38			
39			
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CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	5280.0 U.
43	208-96-8	Acenaphthylene	5280.0 U.
44	83-32-9	Acenaphthene	5280.0 U.
45	86-73-7	Fluorene	5280.0 U.
46	85-01-8	Phenanthrene	5280.0 U.
47	120-12-7	Anthracene	5280.0 U.
48	206-44-0	Fluoranthene	1200.0 J.
49	129-00-0	Pyrene	1100.0 J.
50	56-55-3	Benzo(a)Anthracene	5280.0 U.
51	218-01-9	Chrysene	5280.0 U.
52	205-99-2	Benzo(b)Fluoranthene	5280.0 U.
53	207-08-9	Benzo(k)Fluoranthene	5280.0 U.
54	50-32-8	Benzo(a)Pyrene	5280.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	5280.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	5280.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	5280.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-10
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871010
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/21/90	% MOISTURE:	75

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	110.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	240.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	470.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	320.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	320.000 U.
21	11104-28-2	Aroclor-1221	320.000 U.
22	11141-16-5	Aroclor-1232	320.000 U.
23	53469-21-9	Aroclor-1242	320.000 U.
24	12672-29-6	Aroclor-1248	320.000 U.
25	11097-69-1	Aroclor-1254	640.000 U.
26	11096-82-5	Aroclor-1260	640.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/18/90

SAMPLE ID: LOC-11
LAB ID: 3871011
DIL FACTOR: 2.00
% MOISTURE: 92

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	8250.0 U.
2	541-73-1	1,3-Dichlorobenzene	8250.0 U.
3	106-46-7	1,4-Dichlorobenzene	8250.0 U.
4	95-50-1	1,2-Dichlorobenzene	8250.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	8250.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	8250.0 U.
7	67-72-1	Hexachloroethane	8250.0 U.
8	98-95-3	Nitrobenzene	8250.0 U.
9	78-59-1	Isophorone	8250.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	8250.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	8250.0 U.
12	106-47-8	4-Chloroaniline	8250.0 U.
13	87-68-3	Hexachlorobutadiene	8250.0 U.
14	91-57-6	2-Methylnaphthalene	8250.0 U.
15	77-47-4	Hexachlorocyclopentadiene	8250.0 U.
16	91-58-7	2-Chloronaphthalene	8250.0 U.
17	88-74-4	2-Nitroaniline	41250.0 U.
18	131-11-3	Dimethyl Phthalate	8250.0 U.
19	99-09-2	3-Nitroaniline	41250.0 U.
20	132-64-9	Dibenzofuran	8250.0 U.
21	121-14-2	2,4-Dinitrotoluene	8250.0 U.
22	606-20-2	2,6-Dinitrotoluene	8250.0 U.
23	84-66-2	Diethylphthalate	8250.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	8250.0 U.
25	100-01-6	4-Nitroaniline	41250.0 U.
26	86-30-6	N-Nitrosodiphenylamine	8250.0 U.
27	101-55-3	4-Bromophenyl-phenylether	8250.0 U.
28	118-74-1	Hexachlorobenzene	8250.0 U.
29	84-74-2	Di-n-Butylphthalate	20000.0 T.
30	85-68-7	Butylbenzylphthalate	8250.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	16500.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	7900.0 JB
33	11784-0	Di-n-Octyl Phthalate	8250.0 U.
34	62-75-9	N-Nitrosodimethylamine	8250.0 U.
35	62-53-3	Aniline	8250.0 U.
36	92-87-5	Benzidine	66000.0 U.
37		Dioxin (Screen)	ND
38			
39			
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41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	8250.0 U.
43	208-96-8	Acenaphthylene	8250.0 U.
44	83-32-9	Acenaphthene	8250.0 U.
45	86-73-7	Fluorene	8250.0 U.
46	85-01-8	Phenanthrene	8250.0 U.
47	120-12-7	Anthracene	8250.0 U.
48	206-44-0	Fluoranthene	1100.0 J.
49	129-00-0	Pyrene	550.0 J.
50	56-55-3	Benzo(a)Anthracene	8250.0 U.
51	218-01-9	Chrysene	8250.0 U.
52	205-99-2	Benzo(b)Fluoranthene	8250.0 U.
53	207-08-9	Benzo(k)Fluoranthene	8250.0 U.
54	50-32-8	Benzo(a)Pyrene	8250.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	8250.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	8250.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	8250.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-11
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871011
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/21/90	% MOISTURE:	92

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	200.000 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	320.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	850.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	1000.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	1000.000 U.
21	11104-28-2	Aroclor-1221	1000.000 U.
22	11141-16-5	Aroclor-1232	1000.000 U.
23	53469-21-9	Aroclor-1242	1000.000 U.
24	12672-29-6	Aroclor-1248	1000.000 U.
25	11097-69-1	Aroclor-1254	2000.000 U.
26	11096-82-5	Aroclor-1260	2000.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/18/90

SAMPLE ID: LOC-12
LAB ID: 3871012
DIL FACTOR: 4.00
% MOISTURE: 76

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	5500.0 U.
2	541-73-1	1,3-Dichlorobenzene	5500.0 U.
3	106-46-7	1,4-Dichlorobenzene	5500.0 U.
4	95-50-1	1,2-Dichlorobenzene	5500.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	5500.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	5500.0 U.
7	67-72-1	Hexachloroethane	5500.0 U.
8	98-95-3	Nitrobenzene	5500.0 U.
9	78-59-1	Isophorone	5500.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	5500.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	5500.0 U.
12	106-47-8	4-Chloroaniline	5500.0 U.
13	87-68-3	Hexachlorobutadiene	5500.0 U.
14	91-57-6	2-Methylnaphthalene	5500.0 U.
15	77-47-4	Hexachlorocyclopentadiene	5500.0 U.
16	91-58-7	2-Chloronaphthalene	5500.0 U.
17	88-74-4	2-Nitroaniline	27500.0 U.
18	131-11-3	Dimethyl Phthalate	5500.0 U.
19	99-09-2	3-Nitroaniline	27500.0 U.
20	132-64-9	Dibenzofuran	5500.0 U.
21	121-14-2	2,4-Dinitrotoluene	5500.0 U.
22	606-20-2	2,6-Dinitrotoluene	5500.0 U.
23	84-66-2	Diethylphthalate	5500.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	5500.0 U.
25	100-01-6	4-Nitroaniline	27500.0 U.
26	86-30-6	N-Nitrosodiphenylamine	5500.0 U.
27	101-55-3	4-Bromophenyl-phenylether	5500.0 U.
28	118-74-1	Hexachlorobenzene	5500.0 U.
29	84-74-2	Di-n-Butylphthalate	14000.0 T.
30	85-68-7	Butylbenzylphthalate	5500.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	11000.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	13000.0 TB
33	11784-0	Di-n-Octyl Phthalate	5500.0 U.
34	62-75-9	N-Nitrosodimethylamine	5500.0 U.
35	62-53-3	Aniline	5500.0 U.
36	92-87-5	Benzidine	44000.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	5500.0 U.
43	208-96-8	Acenaphthylene	5500.0 U.
44	83-32-9	Acenaphthene	5500.0 U.
45	86-73-7	Fluorene	5500.0 U.
46	85-01-8	Phenanthrene	5500.0 U.
47	120-12-7	Anthracene	5500.0 U.
48	206-44-0	Fluoranthene	1400.0 J.
49	129-00-0	Pyrene	1300.0 J.
50	56-55-3	Benzo(a)Anthracene	5500.0 U.
51	218-01-9	Chrysene	5500.0 U.
52	205-99-2	Benzo(b)Fluoranthene	5500.0 U.
53	207-08-9	Benzo(k)Fluoranthene	5500.0 U.
54	50-32-8	Benzo(a)Pyrene	5500.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	5500.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	5500.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	5500.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
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80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	LOC-12
CONC. LEVEL:	LOW	LAB SAMPLE ID:	3871012
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/21/90	% MOISTURE:	76

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	100.000 T.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	270.000 T.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	520.000 T.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	330.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	330.000 U.
21	11104-28-2	Aroclor-1221	330.000 U.
22	11141-16-5	Aroclor-1232	330.000 U.
23	53469-21-9	Aroclor-1242	330.000 U.
24	12672-29-6	Aroclor-1248	330.000 U.
25	11097-69-1	Aroclor-1254	670.000 U.
26	11096-82-5	Aroclor-1260	670.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90
UG/L

SAMPLE ID: LCC-1EL
LAB ID: 71001EL
DIL FACTOR: 2.00
% MOISTURE: NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.
9	78-59-1	Isophorone	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.
18	131-11-3	Dimethyl Phthalate	20.0 U.
19	99-09-2	3-Nitroaniline	100.0 U.
20	132-64-9	Dibenzofuran	20.0 U.
21	121-14-2	2,4-Dinitrotoluene	20.0 U.
22	606-20-2	2,6-Dinitrotoluene	20.0 U.
23	84-66-2	Diethylphthalate	20.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.
25	100-01-6	4-Nitroaniline	100.0 U.
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.
28	118-74-1	Hexachlorobenzene	20.0 U.
29	84-74-2	Di-n-Butylphthalate	5.0 JB
30	85-68-7	Butylbenzylphthalate	20.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	54.0 TB
33	11784-0	Di-n-Octyl Phthalate	20.0 U.
34	62-75-9	N-Nitrosodimethylamine	20.0 U.
35	62-53-3	Aniline	20.0 U.
36	92-87-5	Benzidine	160.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	20.0 U.
43	208-96-8	Acenaphthylene	20.0 U.
44	83-32-9	Acenaphthene	20.0 U.
45	86-73-7	Fluorene	20.0 U.
46	85-01-8	Phenanthrene	20.0 U.
47	120-12-7	Anthracene	20.0 U.
48	206-44-0	Fluoranthene	20.0 U.
49	129-00-0	Pyrene	20.0 U.
50	56-55-3	Benzo(a)Anthracene	20.0 U.
51	218-01-9	Chrysene	20.0 U.
52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
54	50-32-8	Benzo(a)Pyrene	20.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-1EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71001EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/6/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90
UG/L

SAMPLE ID: LOC-2EL
LAB ID: 71002EL
DIL FACTOR: 2.00
% MOISTURE: NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.
9	78-59-1	Isophorone	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.
18	131-11-3	Dimethyl Phthalate	20.0 U.
19	99-09-2	3-Nitroaniline	100.0 U.
20	132-64-9	Dibenzofuran	20.0 U.
21	121-14-2	2,4-Dinitrotoluene	20.0 U.
22	606-20-2	2,6-Dinitrotoluene	20.0 U.
23	84-66-2	Diethylphthalate	20.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.
25	100-01-6	4-Nitroaniline	100.0 U.
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.
28	118-74-1	Hexachlorobenzene	20.0 U.
29	84-74-2	Di-n-Butylphthalate	6.0 JB
30	85-68-7	Butylbenzylphthalate	20.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	52.0 TB
33	11784-0	Di-n-Octyl Phthalate	20.0 U.
34	62-75-9	N-Nitrosodimethylamine	20.0 U.
35	62-53-3	Aniline	20.0 U.
36	92-87-5	Benzidine	160.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	20.0 U.
43	208-96-8	Acenaphthylene	20.0 U.
44	83-32-9	Acenaphthene	20.0 U.
45	86-73-7	Fluorene	20.0 U.
46	85-01-8	Phenanthrene	20.0 U.
47	120-12-7	Anthracene	20.0 U.
48	206-44-0	Fluoranthene	20.0 U.
49	129-00-0	Pyrene	20.0 U.
50	56-55-3	Benzo(a)Anthracene	20.0 U.
51	218-01-9	Chrysene	20.0 U.
52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
54	50-32-8	Benzo(a)Pyrene	20.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-2EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71002EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/6/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90
UG/L

SAMPLE ID: LOC-3EL
LAB ID: 71003EL
DIL FACTOR: 2.00
% MOISTURE: NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.
9	78-59-1	Isophorone	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.
18	131-11-3	Dimethyl Phthalate	20.0 U.
19	99-09-2	3-Nitroaniline	100.0 U.
20	132-64-9	Dibenzofuran	20.0 U.
21	121-14-2	2,4-Dinitrotoluene	20.0 U.
22	606-20-2	2,6-Dinitrotoluene	20.0 U.
23	84-66-2	Diethylphthalate	20.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.
25	100-01-6	4-Nitroaniline	100.0 U.
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.
28	118-74-1	Hexachlorobenzene	20.0 U.
29	84-74-2	Di-n-Butylphthalate	8.0 JB
30	85-68-7	Butylbenzylphthalate	20.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	58.0 TB
33	11784-0	Di-n-Octyl Phthalate	20.0 U.
34	62-75-9	N-Nitrosodimethylamine	20.0 U.
35	62-53-3	Aniline	20.0 U.
36	92-87-5	Benzidine	160.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	20.0 U.
43	208-96-8	Acenaphthylene	20.0 U.
44	83-32-9	Acenaphthene	20.0 U.
45	86-73-7	Fluorene	20.0 U.
46	85-01-8	Phenanthrene	20.0 U.
47	120-12-7	Anthracene	20.0 U.
48	206-44-0	Fluoranthene	20.0 U.
49	129-00-0	Pyrene	20.0 U.
50	56-55-3	Benzo(a)Anthracene	20.0 U.
51	218-01-9	Chrysene	20.0 U.
52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
54	50-32-8	Benzo(a)Pyrene	20.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-3EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71003EL
EXTRACTION DATE:	2/20/90	OIL FACTOR:	1.00
ANALYSIS DATE:	3/6/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90

SAMPLE ID: LOC-4EL
LAB ID: 71004EL
DIL FACTOR: 2.00
% MOISTURE:NA

UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/L
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.
9	78-59-1	Isophorone	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.
18	131-11-3	Dimethyl Phthalate	20.0 U.
19	99-09-2	3-Nitroaniline	100.0 U.
20	132-64-9	Dibenzofuran	20.0 U.
21	121-14-2	2,4-Dinitrotoluene	20.0 U.
22	606-20-2	2,6-Dinitrotoluene	20.0 U.
23	84-66-2	Diethylphthalate	20.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.
25	100-01-6	4-Nitroaniline	100.0 U.
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.
28	118-74-1	Hexachlorobenzene	20.0 U.
29	84-74-2	Di-n-Butylphthalate	20.0 U.
30	85-68-7	Butylbenzylphthalate	20.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	33.0 TB
33	11784-0	Di-n-Octyl Phthalate	20.0 U.
34	62-75-9	N-Nitrosodimethylamine	20.0 U.
35	62-53-3	Aniline	20.0 U.
36	92-87-5	Benzidine	160.0 U.
37		Dioxin (Screen)	ND .
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/L
42	91-20-3	Naphthalene	20.0 U.
43	208-96-8	Acenaphthylene	20.0 U.
44	83-32-9	Acenaphthene	20.0 U.
45	86-73-7	Fluorene	20.0 U.
46	85-01-8	Phenanthrene	20.0 U.
47	120-12-7	Anthracene	20.0 U.
48	206-44-0	Fluoranthene	20.0 U.
49	129-00-0	Pyrene	20.0 U.
50	56-55-3	Benzo(a)Anthracene	20.0 U.
51	218-01-9	Chrysene	20.0 U.
52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
54	50-32-8	Benzo(a)Pyrene	20.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-4EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71004EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/7/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

18-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90
UG/L

SAMPLE ID: LOC-5EL
LAB ID: 71005EL
DIL FACTOR: 2.00
% MOISTURE:NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.
9	78-59-1	Isophorone	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.
18	131-11-3	Dimethyl Phthalate	20.0 U.
19	99-09-2	3-Nitroaniline	100.0 U.
20	132-64-9	Dibenzofuran	20.0 U.
21	121-14-2	2,4-Dinitrotoluene	20.0 U.
22	606-20-2	2,6-Dinitrotoluene	20.0 U.
23	84-66-2	Diethylphthalate	20.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.
25	100-01-6	4-Nitroaniline	100.0 U.
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.
28	118-74-1	Hexachlorobenzene	20.0 U.
29	84-74-2	Di-n-Butylphthalate	20.0 U.
30	85-68-7	Butylbenzylphthalate	20.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	34.0 TB
33	11784-0	Di-n-Octyl Phthalate	20.0 U.
34	62-75-9	N-Nitrosodimethylamine	20.0 U.
35	62-53-3	Aniline	20.0 U.
36	92-87-5	Benzidine	160.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	20.0 U.
43	208-96-8	Acenaphthylene	20.0 U.
44	83-32-9	Acenaphthene	20.0 U.
45	86-73-7	Fluorene	20.0 U.
46	85-01-8	Phenanthrene	20.0 U.
47	120-12-7	Anthracene	20.0 U.
48	206-44-0	Fluoranthene	20.0 U.
49	129-00-0	Pyrene	20.0 U.
50	56-55-3	Benzo(a)Anthracene	20.0 U.
51	218-01-9	Chrysene	20.0 U.
52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
54	50-32-8	Benzo(a)Pyrene	20.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LCC-5EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71005EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/7/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90
UG/L

SAMPLE ID: LOC-6EL
LAB ID: 71006EL
DIL FACTOR: 2.00
% MOISTURE: NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS		CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.	42	91-20-3	Naphthalene	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.	43	208-96-8	Acenaphthylene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.	44	83-32-9	Acenaphthene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.	45	86-73-7	Fluorene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.	46	85-01-8	Phenanthrene	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.	47	120-12-7	Anthracene	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.	48	206-44-0	Fluoranthene	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.	49	129-00-0	Pyrene	20.0 U.
9	78-59-1	Isophorone	20.0 U.	50	56-55-3	Benzo(a)Anthracene	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.	51	218-01-9	Chrysene	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.	52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.	53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.	54	50-32-8	Benzo(a)Pyrene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.	55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.	56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.	57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.	58			
18	131-11-3	Dimethyl Phthalate	20.0 U.	59			
19	99-09-2	3-Nitroaniline	100.0 U.	60			
20	132-64-9	Dibenzofuran	20.0 U.			ACID COMPOUNDS	
21	121-14-2	2,4-Dinitrotoluene	20.0 U.				
22	606-20-2	2,6-Dinitrotoluene	20.0 U.	61	108-95-2	Phenol	NA
23	84-66-2	Diethylphthalate	20.0 U.	62	95-57-8	2-Chlorophenol	NA
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.	63	100-51-6	Benzyl Alcohol	NA
25	100-01-6	4-Nitroaniline	100.0 U.	64	95-48-7	2-Methylphenol	NA
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.	65	106-44-5	4-Methylphenol	NA
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.	66	88-75-5	2-Nitrophenol	NA
28	118-74-1	Hexachlorobenzene	20.0 U.	67	105-67-9	2,4-Dimethylphenol	NA
29	84-74-2	Di-n-Butylphthalate	7.0 JB	68	65-85-0	Benzoic Acid	NA
30	85-68-7	Butylbenzylphthalate	20.0 U.	69	120-83-2	2,4-Dichlorophenol	NA
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.	70	59-50-7	4-Chloro-3-Methylphenol	NA
32	117-81-7	bis(2-Ethylhexyl)Phthalate	73.0 TB	71	88-6-2	2,4,6-Trichlorophenol	NA
33	11784-0	Di-n-Octyl Phthalate	20.0 U.	72	95-95-4	2,4,5-Trichlorophenol	NA
34	62-75-9	N-Nitrosodimethylamine	20.0 U.	73	51-28-5	2,4-Dinitrophenol	NA
35	62-53-3	Aniline	20.0 U.	74	100-02-7	4-Nitrophenol	NA
36	92-87-5	Benzidine	160.0 U.	75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
37		Dioxin (Screen)	ND	76	87-86-5	Pentachlorophenol	NA
38				77			
39				78			
40				79			
41				80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-6EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71006EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/7/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90

SAMPLE ID: LOC-7EL
LAB ID: 71007EL
DIL FACTOR: 2.00
% MOISTURE: NA

UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/L
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.
9	78-59-1	Isophorone	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.
18	131-11-3	Dimethyl Phthalate	20.0 U.
19	99-09-2	3-Nitroaniline	100.0 U.
20	132-64-9	Dibenzofuran	20.0 U.
21	121-14-2	2,4-Dinitrotoluene	20.0 U.
22	606-20-2	2,6-Dinitrotoluene	20.0 U.
23	84-66-2	Diethylphthalate	20.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.
25	100-01-6	4-Nitroaniline	100.0 U.
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.
28	118-74-1	Hexachlorobenzene	20.0 U.
29	84-74-2	Di-n-Butylphthalate	20.0 U.
30	85-68-7	Butylbenzylphthalate	20.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	210.0 TB
33	11784-0	Di-n-Octyl Phthalate	20.0 U.
34	62-75-9	N-Nitrosodimethylamine	20.0 U.
35	62-53-3	Aniline	20.0 U.
36	92-87-5	Benzidine	160.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/L
42	91-20-3	Naphthalene	20.0 U.
43	208-96-8	Acenaphthylene	20.0 U.
44	83-32-9	Acenaphthene	20.0 U.
45	86-73-7	Fluorene	20.0 U.
46	85-01-8	Phenanthrene	20.0 U.
47	120-12-7	Anthracene	20.0 U.
48	206-44-0	Fluoranthene	20.0 U.
49	129-00-0	Pyrene	20.0 U.
50	56-55-3	Benzo(a)Anthracene	20.0 U.
51	218-01-9	Chrysene	20.0 U.
52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
54	50-32-8	Benzo(a)Pyrene	20.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-7EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71007EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/7/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90
UG/L

SAMPLE ID: LCC-8EL
LAB ID: 71008EL
DIL FACTOR: 2.00
% MOISTURE: NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.
9	78-59-1	Isophorone	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.
18	131-11-3	Dimethyl Phthalate	20.0 U.
19	99-09-2	3-Nitroaniline	100.0 U.
20	132-64-9	Dibenzofuran	20.0 U.
21	121-14-2	2,4-Dinitrotoluene	20.0 U.
22	606-20-2	2,6-Dinitrotoluene	20.0 U.
23	84-66-2	Diethylphthalate	20.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.
25	100-01-6	4-Nitroaniline	100.0 U.
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.
28	118-74-1	Hexachlorobenzene	20.0 U.
29	84-74-2	Di-n-Butylphthalate	20.0 U.
30	85-68-7	Butylbenzylphthalate	20.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	220.0 TB
33	11784-0	Di-n-Octyl Phthalate	20.0 U.
34	62-75-9	N-Nitrosodimethylamine	20.0 U.
35	62-53-3	Aniline	20.0 U.
36	92-87-5	Benzidine	160.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	20.0 U.
43	208-96-8	Acenaphthylene	20.0 U.
44	83-32-9	Acenaphthene	20.0 U.
45	86-73-7	Fluorene	20.0 U.
46	85-01-8	Phenanthrene	20.0 U.
47	120-12-7	Anthracene	20.0 U.
48	206-44-0	Fluoranthene	20.0 U.
49	129-00-0	Pyrene	20.0 U.
50	56-55-3	Benzo(a)Anthracene	20.0 U.
51	218-01-9	Chrysene	20.0 U.
52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
54	50-32-8	Benzo(a)Pyrene	20.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-8EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71008EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/7/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90
UG/L

SAMPLE ID: LOC-9EL
LAB ID: 71009EL
DIL FACTOR: 2.00
% MOISTURE: NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	20.0 U.
2	541-73-1	1,3-Dichlorobenzene	20.0 U.
3	106-46-7	1,4-Dichlorobenzene	20.0 U.
4	95-50-1	1,2-Dichlorobenzene	20.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	20.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U.
7	67-72-1	Hexachloroethane	20.0 U.
8	98-95-3	Nitrobenzene	20.0 U.
9	78-59-1	Isophorone	20.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	20.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	20.0 U.
12	106-47-8	4-Chloroaniline	20.0 U.
13	87-68-3	Hexachlorobutadiene	20.0 U.
14	91-57-6	2-Methylnaphthalene	20.0 U.
15	77-47-4	Hexachlorocyclopentadiene	20.0 U.
16	91-58-7	2-Chloronaphthalene	20.0 U.
17	88-74-4	2-Nitroaniline	100.0 U.
18	131-11-3	Dimethyl Phthalate	20.0 U.
19	99-09-2	3-Nitroaniline	100.0 U.
20	132-64-9	Dibenzofuran	20.0 U.
21	121-14-2	2,4-Dinitrotoluene	20.0 U.
22	606-20-2	2,6-Dinitrotoluene	20.0 U.
23	84-66-2	Diethylphthalate	20.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	20.0 U.
25	100-01-6	4-Nitroaniline	100.0 U.
26	86-30-6	N-Nitrosodiphenylamine	20.0 U.
27	101-55-3	4-Bromophenyl-phenylether	20.0 U.
28	118-74-1	Hexachlorobenzene	20.0 U.
29	84-74-2	Di-n-Butylphthalate	20.0 U.
30	85-68-7	Butylbenzylphthalate	20.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	40.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	310.0 TB
33	11784-0	Di-n-Octyl Phthalate	20.0 U.
34	62-75-9	N-Nitrosodimethylamine	20.0 U.
35	62-53-3	Aniline	20.0 U.
36	92-87-5	Benzidine	160.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	20.0 U.
43	208-96-8	Acenaphthylene	20.0 U.
44	83-32-9	Acenaphthene	20.0 U.
45	86-73-7	Fluorene	20.0 U.
46	85-01-8	Phenanthrene	20.0 U.
47	120-12-7	Anthracene	20.0 U.
48	206-44-0	Fluoranthene	20.0 U.
49	129-00-0	Pyrene	20.0 U.
50	56-55-3	Benzo(a)Anthracene	20.0 U.
51	218-01-9	Chrysene	20.0 U.
52	205-99-2	Benzo(b)Fluoranthene	20.0 U.
53	207-08-9	Benzo(k)Fluoranthene	20.0 U.
54	50-32-8	Benzo(a)Pyrene	20.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	20.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	20.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/7/90

SAMPLE ID: LOC-SEL
LAB SAMPLE ID: 71009EL
DIL FACTOR: 1.00
% MOISTURE: NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

18-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90
UG/L

SAMPLE ID: LOC-10EL
LAB ID: 71010EL
DIL FACTOR: 1.00
% MOISTURE:NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	10.0 U.
2	541-73-1	1,3-Dichlorobenzene	10.0 U.
3	106-46-7	1,4-Dichlorobenzene	10.0 U.
4	95-50-1	1,2-Dichlorobenzene	10.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	10.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U.
7	67-72-1	Hexachloroethane	10.0 U.
8	98-95-3	Nitrobenzene	10.0 U.
9	78-59-1	Isophorone	10.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	10.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	10.0 U.
12	106-47-8	4-Chloroaniline	10.0 U.
13	87-68-3	Hexachlorobutadiene	10.0 U.
14	91-57-6	2-Methylnaphthalene	10.0 U.
15	77-47-4	Hexachlorocyclopentadiene	10.0 U.
16	91-58-7	2-Chloronaphthalene	10.0 U.
17	88-74-4	2-Nitroaniline	50.0 U.
18	131-11-3	Dimethyl Phthalate	10.0 U.
19	99-09-2	3-Nitroaniline	50.0 U.
20	132-64-9	Dibenzofuran	10.0 U.
21	121-14-2	2,4-Dinitrotoluene	10.0 U.
22	606-20-2	2,6-Dinitrotoluene	10.0 U.
23	84-66-2	Diethylphthalate	10.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	10.0 U.
25	100-01-6	4-Nitroaniline	50.0 U.
26	86-30-6	N-Nitrosodiphenylamine	10.0 U.
27	101-55-3	4-Bromophenyl-phenylether	10.0 U.
28	118-74-1	Hexachlorobenzene	10.0 U.
29	84-74-2	Di-n-Butylphthalate	10.0 U.
30	85-68-7	Butylbenzylphthalate	10.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	20.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	310.0 TB
33	11784-0	Di-n-Octyl Phthalate	10.0 U.
34	62-75-9	N-Nitrosodimethylamine	10.0 U.
35	62-53-3	Aniline	10.0 U.
36	92-87-5	Benzidine	80.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	10.0 U.
43	208-96-8	Acenaphthylene	10.0 U.
44	83-32-9	Acenaphthene	10.0 U.
45	86-73-7	Fluorene	10.0 U.
46	85-01-8	Phenanthrene	10.0 U.
47	120-12-7	Anthracene	10.0 U.
48	206-44-0	Fluoranthene	10.0 U.
49	129-00-0	Pyrene	10.0 U.
50	56-55-3	Benzo(a)Anthracene	10.0 U.
51	218-01-9	Chrysene	10.0 U.
52	205-99-2	Benzo(b)Fluoranthene	10.0 U.
53	207-08-9	Benzo(k)Fluoranthene	10.0 U.
54	50-32-8	Benzo(a)Pyrene	10.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	10.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	10.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
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1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-10EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71010EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/7/90	% MOISTURE:	NA
			UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90
UG/L

SAMPLE ID: LOC-11EL
LAB ID: 71011EL
DIL FACTOR: 1.00
% MOISTURE: NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	10.0 U.
2	541-73-1	1,3-Dichlorobenzene	10.0 U.
3	106-46-7	1,4-Dichlorobenzene	10.0 U.
4	95-50-1	1,2-Dichlorobenzene	10.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	10.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U.
7	67-72-1	Hexachloroethane	10.0 U.
8	98-95-3	Nitrobenzene	10.0 U.
9	78-59-1	Isophorone	10.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	10.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	10.0 U.
12	106-47-8	4-Chloroaniline	10.0 U.
13	87-68-3	Hexachlorobutadiene	10.0 U.
14	91-57-6	2-Methylnaphthalene	10.0 U.
15	77-47-4	Hexachlorocyclopentadiene	10.0 U.
16	91-58-7	2-Chloronaphthalene	10.0 U.
17	88-74-4	2-Nitroaniline	50.0 U.
18	131-11-3	Dimethyl Phthalate	10.0 U.
19	99-09-2	3-Nitroaniline	50.0 U.
20	132-64-9	Dibenzofuran	10.0 U.
21	121-14-2	2,4-Dinitrotoluene	10.0 U.
22	606-20-2	2,6-Dinitrotoluene	10.0 U.
23	84-66-2	Diethylphthalate	10.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	10.0 U.
25	100-01-6	4-Nitroaniline	50.0 U.
26	86-30-6	N-Nitrosodiphenylamine	10.0 U.
27	101-55-3	4-Bromophenyl-phenylether	10.0 U.
28	118-74-1	Hexachlorobenzene	10.0 U.
29	84-74-2	Di-n-Butylphthalate	10.0 U.
30	85-68-7	Butylbenzylphthalate	10.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	20.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	54.0 TB
33	11784-0	Di-n-Octyl Phthalate	10.0 U.
34	62-75-9	N-Nitrosodimethylamine	10.0 U.
35	62-53-3	Aniline	10.0 U.
36	92-87-5	Benzidine	80.0 U.
37		Dioxin (Screen)	NO
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	10.0 U.
43	208-96-8	Acenaphthylene	10.0 U.
44	83-32-9	Acenaphthene	10.0 U.
45	86-73-7	Fluorene	10.0 U.
46	85-01-8	Phenanthrene	10.0 U.
47	120-12-7	Anthracene	10.0 U.
48	206-44-0	Fluoranthene	10.0 U.
49	129-00-0	Pyrene	10.0 U.
50	56-55-3	Benzo(a)Anthracene	10.0 U.
51	218-01-9	Chrysene	10.0 U.
52	205-99-2	Benzo(b)Fluoranthene	10.0 U.
53	207-08-9	Benzo(k)Fluoranthene	10.0 U.
54	50-32-8	Benzo(a)Pyrene	10.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	10.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	10.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-11EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71011EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/7/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

1B-P

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID: LOC-12EL
LAB ID: 71012EL
DIL FACTOR: 1.00
% MOISTURE: NA

UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/L
1	111-44-4	bis(2-Chloroethyl)ether	10.0 U.
2	541-73-1	1,3-Dichlorobenzene	10.0 U.
3	106-46-7	1,4-Dichlorobenzene	10.0 U.
4	95-50-1	1,2-Dichlorobenzene	10.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	10.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U.
7	67-72-1	Hexachloroethane	10.0 U.
8	98-95-3	Nitrobenzene	10.0 U.
9	78-59-1	Isophorone	10.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	10.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	10.0 U.
12	106-47-8	4-Chloroaniline	10.0 U.
13	87-68-3	Hexachlorobutadiene	10.0 U.
14	91-57-6	2-Methylnaphthalene	10.0 U.
15	77-47-4	Hexachlorocyclopentadiene	10.0 U.
16	91-58-7	2-Chloronaphthalene	10.0 U.
17	88-74-4	2-Nitroaniline	50.0 U.
18	131-11-3	Dimethyl Phthalate	10.0 U.
19	99-09-2	3-Nitroaniline	50.0 U.
20	132-64-9	Dibenzofuran	10.0 U.
21	121-14-2	2,4-Dinitrotoluene	10.0 U.
22	606-20-2	2,6-Dinitrotoluene	10.0 U.
23	84-66-2	Diethylphthalate	10.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	10.0 U.
25	100-01-6	4-Nitroaniline	50.0 U.
26	86-30-6	N-Nitrosodiphenylamine	10.0 U.
27	101-55-3	4-Bromophenyl-phenylether	10.0 U.
28	118-74-1	Hexachlorobenzene	10.0 U.
29	84-74-2	Di-n-Butylphthalate	10.0 U.
30	85-68-7	Butylbenzylphthalate	10.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	20.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	10.0 U.
33	11784-0	Di-n-Octyl Phthalate	10.0 U.
34	62-75-9	N-Nitrosodimethylamine	10.0 U.
35	62-53-3	Aniline	10.0 U.
36	92-87-5	Benzidine	80.0 U.
37		Dioxin (Screen)	ND
38			
39			
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41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/L
42	91-20-3	Naphthalene	10.0 U.
43	208-96-8	Acenaphthylene	10.0 U.
44	83-32-9	Acenaphthene	10.0 U.
45	86-73-7	Fluorene	10.0 U.
46	85-01-8	Phenanthrene	10.0 U.
47	120-12-7	Anthracene	10.0 U.
48	206-44-0	Fluoranthene	10.0 U.
49	129-00-0	Pyrene	10.0 U.
50	56-55-3	Benzo(a)Anthracene	10.0 U.
51	218-01-9	Chrysene	10.0 U.
52	205-99-2	Benzo(b)Fluoranthene	10.0 U.
53	207-08-9	Benzo(k)Fluoranthene	10.0 U.
54	50-32-8	Benzo(a)Pyrene	10.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	10.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	10.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	LOC-12EL
CONC. LEVEL:	LOW	LAB SAMPLE ID:	71012EL
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/7/90	% MOISTURE:	NA

UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/17/90

SAMPLE ID:METHOD BLANK
LAB ID: F1338
DIL FACTOR: 1.00
% MOISTURE:NA

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	UG/KG (DRY BASIS)
1	111-44-4	bis(2-Chloroethyl)ether	330.0 U.
2	541-73-1	1,3-Dichlorobenzene	330.0 U.
3	106-46-7	1,4-Dichlorobenzene	330.0 U.
4	95-50-1	1,2-Dichlorobenzene	330.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	330.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	330.0 U.
7	67-72-1	Hexachloroethane	330.0 U.
8	98-95-3	Nitrobenzene	330.0 U.
9	78-59-1	Isophorone	330.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	330.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	330.0 U.
12	106-47-8	4-Chloroaniline	330.0 U.
13	87-68-3	Hexachlorobutadiene	330.0 U.
14	91-57-6	2-Methylnaphthalene	330.0 U.
15	77-47-4	Hexachlorocyclopentadiene	330.0 U.
16	91-58-7	2-Chloronaphthalene	330.0 U.
17	88-74-4	2-Nitroaniline	1650.0 U.
18	131-11-3	Dimethyl Phthalate	330.0 U.
19	99-09-2	3-Nitroaniline	1650.0 U.
20	132-64-9	Dibenzofuran	330.0 U.
21	121-14-2	2,4-Dinitrotoluene	330.0 U.
22	606-20-2	2,6-Dinitrotoluene	330.0 U.
23	84-66-2	Diethylphthalate	330.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	330.0 U.
25	100-01-6	4-Nitroaniline	1650.0 U.
26	86-30-6	N-Nitrosodiphenylamine	330.0 U.
27	101-55-3	4-Bromophenyl-phenylether	330.0 U.
28	118-74-1	Hexachlorobenzene	330.0 U.
29	84-74-2	Di-n-Butylphthalate	330.0 U.
30	85-68-7	Butylbenzylphthalate	330.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	660.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	190.0 J.
33	11784-0	Di-n-Octyl Phthalate	330.0 U.
34	62-75-9	N-Nitrosodimethylamine	330.0 U.
35	62-53-3	Aniline	330.0 U.
36	92-87-5	Benzidine	2640.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	UG/KG (DRY BASIS)
42	91-20-3	Naphthalene	330.0 U.
43	208-96-8	Acenaphthylene	330.0 U.
44	83-32-9	Acenaphthene	330.0 U.
45	86-73-7	Fluorene	330.0 U.
46	85-01-8	Phenanthrene	330.0 U.
47	120-12-7	Anthracene	330.0 U.
48	206-44-0	Fluoranthene	330.0 U.
49	129-00-0	Pyrene	330.0 U.
50	56-55-3	Benzo(a)Anthracene	330.0 U.
51	218-01-9	Chrysene	330.0 U.
52	205-99-2	Benzo(b)Fluoranthene	330.0 U.
53	207-08-9	Benzo(k)Fluoranthene	330.0 U.
54	50-32-8	Benzo(a)Pyrene	330.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	330.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	330.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	330.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/16/90
UG/L

SAMPLE ID: METHOD BLANK
LAB ID: F1311
DIL FACTOR: 1.00
% MOISTURE: NA
UG/L

CMPD #	CAS Number	BASE NEUTRAL COMPOUNDS	
1	111-44-4	bis(2-Chloroethyl)ether	10.0 U.
2	541-73-1	1,3-Dichlorobenzene	10.0 U.
3	106-46-7	1,4-Dichlorobenzene	10.0 U.
4	95-50-1	1,2-Dichlorobenzene	10.0 U.
5	39638-32-9	bis(2-chloroisopropyl)ether	10.0 U.
6	621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U.
7	67-72-1	Hexachloroethane	10.0 U.
8	98-95-3	Nitrobenzene	10.0 U.
9	78-59-1	Isophorone	10.0 U.
10	111-91-1	bis(2-chloroethoxy)Methane	10.0 U.
11	120-82-1	1,2,4-Trichlorobenzene	10.0 U.
12	106-47-8	4-Chloroaniline	10.0 U.
13	87-68-3	Hexachlorobutadiene	10.0 U.
14	91-57-6	2-Methylnaphthalene	10.0 U.
15	77-47-4	Hexachlorocyclopentadiene	10.0 U.
16	91-58-7	2-Chloronaphthalene	10.0 U.
17	88-74-4	2-Nitroaniline	50.0 U.
18	131-11-3	Dimethyl Phthalate	10.0 U.
19	99-09-2	3-Nitroaniline	50.0 U.
20	132-64-9	Dibenzofuran	10.0 U.
21	121-14-2	2,4-Dinitrotoluene	10.0 U.
22	606-20-2	2,6-Dinitrotoluene	10.0 U.
23	84-66-2	Diethylphthalate	10.0 U.
24	7005-72-3	4-Chlorophenyl-phenylether	10.0 U.
25	100-01-6	4-Nitroaniline	50.0 U.
26	86-30-6	N-Nitrosodiphenylamine	10.0 U.
27	101-55-3	4-Bromophenyl-phenylether	10.0 U.
28	118-74-1	Hexachlorobenzene	10.0 U.
29	84-74-2	Di-n-Butylphthalate	3.0 J.
30	85-68-7	Butylbenzylphthalate	10.0 U.
31	91-94-1	3,3'-Dichlorobenzidine	20.0 U.
32	117-81-7	bis(2-Ethylhexyl)Phthalate	33.0 T.
33	11784-0	Di-n-Octyl Phthalate	10.0 U.
34	62-75-9	N-Nitrosodimethylamine	10.0 U.
35	62-53-3	Aniline	10.0 U.
36	92-87-5	Benzidine	80.0 U.
37		Dioxin (Screen)	ND
38			
39			
40			
41			

CMPD #	CAS Number	BASE NEUTRAL/PAH COMPOUNDS	
42	91-20-3	Naphthalene	10.0 U.
43	208-96-8	Acenaphthylene	10.0 U.
44	83-32-9	Acenaphthene	10.0 U.
45	86-73-7	Fluorene	10.0 U.
46	85-01-8	Phenanthrene	10.0 U.
47	120-12-7	Anthracene	10.0 U.
48	206-44-0	Fluoranthene	10.0 U.
49	129-00-0	Pyrene	10.0 U.
50	56-55-3	Benzo(a)Anthracene	10.0 U.
51	218-01-9	Chrysene	10.0 U.
52	205-99-2	Benzo(b)Fluoranthene	10.0 U.
53	207-08-9	Benzo(k)Fluoranthene	10.0 U.
54	50-32-8	Benzo(a)Pyrene	10.0 U.
55	193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U.
56	53-70-3	Dibenz(a,h)Anthracene	10.0 U.
57	191-24-2	Benzo(g,h,i)Perylene	10.0 U.
58			
59			
60			
		ACID COMPOUNDS	
61	108-95-2	Phenol	NA
62	95-57-8	2-Chlorophenol	NA
63	100-51-6	Benzyl Alcohol	NA
64	95-48-7	2-Methylphenol	NA
65	106-44-5	4-Methylphenol	NA
66	88-75-5	2-Nitrophenol	NA
67	105-67-9	2,4-Dimethylphenol	NA
68	65-85-0	Benzoic Acid	NA
69	120-83-2	2,4-Dichlorophenol	NA
70	59-50-7	4-Chloro-3-Methylphenol	NA
71	88-6-2	2,4,6-Trichlorophenol	NA
72	95-95-4	2,4,5-Trichlorophenol	NA
73	51-28-5	2,4-Dinitrophenol	NA
74	100-02-7	4-Nitrophenol	NA
75	534-52-1	4,6-Dinitro-2-Methylphenol	NA
76	87-86-5	Pentachlorophenol	NA
77			
78			
79			
80			

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 2/20/90
ANALYSIS DATE: 3/20/90

SAMPLE ID: METHOD BLANK
LAB SAMPLE ID: BLANK
DIL FACTOR: 1.00
% MOISTURE: NA

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	16.000 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	16.000 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	16.000 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	80.000 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	80.000 U.
21	11104-28-2	Aroclor-1221	80.000 U.
22	11141-16-5	Aroclor-1232	80.000 U.
23	53469-21-9	Aroclor-1242	80.000 U.
24	12672-29-6	Aroclor-1248	80.000 U.
25	11097-69-1	Aroclor-1254	160.000 U.
26	11096-82-5	Aroclor-1260	160.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	WATER	SAMPLE ID:	METHOD BLANK
CONC. LEVEL:	LOW	LAB SAMPLE ID:	BLANK
EXTRACTION DATE:	2/20/90	DIL FACTOR:	1.00
ANALYSIS DATE:	3/20/90	% MOISTURE:	NA
			UG/L

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	
1	319-84-6	Alpha-BHC	NA
2	319-85-7	Beta-BHC	NA
3	319-86-8	Delta-BHC	NA
4	58-89-9	Gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	0.100 U.
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	0.100 U.
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	0.100 U.
16	53494-70-5	Endrin Ketone	NA
17	72-43-5	Methoxychlor	NA
18	57-74-9	Chlordane	0.500 U.
19	8001-35-2	Toxaphene	NA
20	12674-11-2	Aroclor-1016	0.500 U.
21	11104-28-2	Aroclor-1221	0.500 U.
22	11141-16-5	Aroclor-1232	0.500 U.
23	53469-21-9	Aroclor-1242	0.500 U.
24	12672-29-6	Aroclor-1248	0.500 U.
25	11097-69-1	Aroclor-1254	1.000 U.
26	11096-82-5	Aroclor-1260	1.000 U.

NYTEST ENVIRONMENTAL INC.
SEMIVOLATILE SURROGATE RECOVERY

LOG IN #: 3871 PAGE #: 1

MATRIX: SOIL

		BASE NEUTRAL			ACID				
	SAMPLE #	NITRO-BENZENE-D5	FLUORO-BIPHENYL	TERPHENYL-D14	2-FLUORO-PHENOL	PHENOL-D5	2,4,6-TRIBROMOPHENOL	BN'S OUT	ACIDS OUT
01	METHOD BLANK	67 OK	67 OK	40 OK	NA	NA	NA	0	NA
02	LCC-1	74 OK	85 OK	79 OK	NA	NA	NA	0	NA
03	LCC-2	63 OK	72 OK	67 OK	NA	NA	NA	0	NA
04	LCC-3	74 OK	81 OK	75 OK	NA	NA	NA	0	NA
05	LCC-4	65 OK	72 OK	51 OK	NA	NA	NA	0	NA
06	LCC-5	66 OK	68 OK	52 OK	NA	NA	NA	0	NA
07	LCC-6	61 OK	71 OK	33 OK	NA	NA	NA	0	NA
08	LCC-7	47 OK	50 OK	31 OK	NA	NA	NA	0	NA
09	LCC-8	123 OK	136 *	105 OK	NA	NA	NA	1	NA
10	LCC-9	75 OK	87 OK	70 OK	NA	NA	NA	0	NA
11	LCC-10	71 OK	87 OK	73 OK	NA	NA	NA	0	NA
12	LCC-11	31 OK	39 OK	24 OK	NA	NA	NA	0	NA
13	LCC-12	76 OK	87 OK	76 OK	NA	NA	NA	0	NA
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

	LIMITS
NITROBENZENE-D5	5 - 185
FLUOROBIPHENYL	10 - 125
TERPHENYL-D14	10 - 145
2-FLUOROPHENOL	10 - 121
PHENOL	20 - 113
2,4,6-TRIBROMOPHENOL	5 - 225

* SURROGATES OUTSIDE QC LIMITS

NYTEST ENVIRONMENTAL INC.
SEMIVOLATILE SURROGATE RECOVERY

LOG IN #: 3871 PAGE #: 1

MATRIX: WATER

		BASE NEUTRAL			ACID				
	SAMPLE #	NITRO-BENZENE-D5	FLUORO-BIPHENYL	TERPHENYL-D14	2-FLUORO-PHENOL	PHENOL-D5	2,4,6-TRI BROMOPHENOL	BN'S OUT	ACIDS OUT
01	METHOD BLANK	71 OK	68 OK	47 OK	NA	NA	NA	0	NA
02	LOC-1EL	67 OK	65 OK	45 OK	NA	NA	NA	0	NA
03	LOC-2EL	62 OK	62 OK	42 OK	NA	NA	NA	0	NA
04	LOC-3EL	68 OK	67 OK	46 OK	NA	NA	NA	0	NA
05	LOC-4EL	68 OK	67 OK	45 OK	NA	NA	NA	0	NA
06	LOC-5EL	62 OK	63 OK	43 OK	NA	NA	NA	0	NA
07	LOC-6EL	65 OK	63 OK	49 OK	NA	NA	NA	0	NA
08	LOC-7EL	125 *	102 OK	55 OK	NA	NA	NA	1	NA
09	LOC-8EL	52 OK	50 OK	38 OK	NA	NA	NA	0	NA
10	LOC-9EL	73 OK	70 OK	56 OK	NA	NA	NA	0	NA
11	LOC-10EL	77 OK	73 OK	82 OK	NA	NA	NA	0	NA
12	LOC-11EL	73 OK	65 OK	47 OK	NA	NA	NA	0	NA
13	LOC-12EL	59 OK	58 OK	53 OK	NA	NA	NA	0	NA
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

	LIMITS
NITROBENZENE-D5	10 - 115
FLUOROBIPHENYL	5 - 120
TERPHENYL-D14	15 - 145
2-FLUOROPHENOL	5 - 100
PHENOL	5 - 94
2,4,6-TRIBROMOPHENOL	5 - 145

* SURROGATES OUTSIDE QC LIMITS

2 D

NYTEST ENVIRONMENTAL INC.

PESTICIDE SURROGATE RECOVERY

LOG IN #: 3871 PAGE #:

MATRIX: SOIL

		<<<PESTICIDE>>>	
	SAMPLE #	DBC	PEST OUT
01	BLANK	152 OK	0
02	LOC-1	134 OK	0
03	LOC-2	103 OK	0
04	LOC-3	104 OK	0
05	LOC-4	147 OK	0
06	LOC-5	91 OK	0
07	LOC-6	112 OK	0
08	LOC-7	74 OK	0
09	LOC-8	121 OK	0
10	LOC-9	165 OK	0
11	LOC-10	128 OK	0
12	LOC-11	69 OK	0
13	LOC-12	113 OK	0
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

	LIMITS
DBC	5 - 325

* SURROGATES OUTSIDE QC LIMITS

2 D

NYTEST ENVIRONMENTAL INC.

PESTICIDE SURROGATE RECOVERY

LOG IN #: 3871 PAGE #:

MATRIX: WATER (Elutriates)

RP 4/9

|<<<PESTICIDE>>> |

	SAMPLE #	DBC	PEST OUT
01	BLANK	132 OK	0
02	LOC-1	127 OK	0
03	LOC-2	137 OK	0
04	LOC-3	147 OK	0
05	LOC-4	157 OK	0
06	LOC-5	157 OK	0
07	LOC-6	167 OK	0
08	LOC-7	144 OK	0
09	LOC-8	146 OK	0
10	LOC-9	138 OK	0
11	LOC-10	166 OK	0
12	LOC-11	143 OK	0
13	LOC-12	159 OK	0
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

	LIMITS
DBC	5 - 285

* SURROGATES OUTSIDE QC LIMITS

00067

3 8

NYTEST ENVIRONMENTAL INC.

SEMI-VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

LOGIN #: 3871 MATRIX: SOIL PAGE: 1

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug)	SAMPLE RESULT	CONC. MS	% RECOVERY	CONC. MSD	% RECOVERY	RPD	QC LIMITS RPD	QC LIMITS RECOVERY
	1,4-DICHLOROBENZENE	100	0.00	55.91	55.91 OK	48.01	48.01 OK	15.21 OK	22	10 -145
SAMPLE #	N-NITROSO-DI-NPROPYLAMINE	100	0.00	61.50	61.50 OK	51.84	51.84 OK	17.06 *	16	10 -135
90736	1,2,4-TRICHLOROBENZENE	100	0.00	59.12	59.12 OK	47.55	47.55 OK	21.69 *	21	10 -155
NYTEST #	ACENAPHTHENE	100	0.00	60.52	60.52 OK	50.40	50.40 OK	18.24 OK	32	10 -180
3711009	2,4-DINITROTOLUENE	100	0.00	67.73	67.73 OK	54.25	54.25 OK	22.11 OK	37	25 -125
	PYRENE	100	0.00	64.75	64.75 OK	53.91	53.91 OK	18.26 OK	36	10 -225
	PHENOL								21	10 -165
SAMPLE #	2-CHLOROPHENOL								23	10 -165
	4-CHLORO-3-METHYLPHENOL								24	10 -165
NYTEST #	4-NITROPHENOL								45	10 -185
	PENTACHLOROPHENOL								23	10 -155

OF % MS/MSD OUT: 0 OF 12

OF RPD OUT: 2 OF 6

NYTEST ENVIRONMENTAL INC.

SEMI-VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

LOGIN #: 3871 MATRIX: WATER PAGE: 1

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug)	SAMPLE RESULT	CONC. MS	% RECOVERY	CONC. MSD	% RECOVERY	RPD	QC LIMITS RPD	QC LIMITS RECOVERY
	1,4-DICHLOROBENZENE	100	0.00	79.77	79.77 OK	89.43	89.43 OK	11.42 OK	23	35 -120
SAMPLE #	N-NITROSO-DI-NPROPYLAMINE	100	0.00	74.62	74.62 OK	87.26	87.26 OK	15.62 OK	24	15 -125
KO-1	1,2,4-TRICHLOROBENZENE	100	0.00	79.99	79.99 OK	85.36	85.36 OK	6.49 OK	30	35 -115
NYTEST #	ACENAPHTHENE	100	0.00	81.68	81.68 OK	87.26	87.26 OK	6.60 OK	23	10 -200
792009	2,4-DINITROTOLUENE	100	0.00	90.22	90.22 OK	90.72	90.72 OK	0.56 OK	40	10 -215
	PYRENE	100	0.00	55.11	55.11 OK	62.53	62.53 OK	12.60 OK	47	30 -145
	PHENOL								25	10 -105
SAMPLE #	2-CHLOROPHENOL								32	15 -140
	4-CHLORO-3-METHYLPHENOL								25	10 -175
NYTEST #	4-NITROPHENOL								45	10 -160
	PENTACHLOROPHENOL								36	10 -215

OF % MS/MSD 0 OF 12
BN OUT: —

OF RPD 0 OF 6
BN OUT: —

3 D

NYTEST ENVIRONMENTAL INC.

PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

LOGIN #: 3871 MATRIX: SOIL PAGE: 1

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug)	SAMPLE RESULT	CONC. MS	% RECOVERY	CONC. MSD	% RECOVERY	RPD	QC LIMITS RPD	QC LIMITS RECOVERY
	LINDANE	29.6	0.00	37.00	125.00 OK	37.90	128.04 OK	2.40 OK	23	10 -230
SAMPLE #	HEPTACHLOR	29.6	0.00	33.60	113.51 OK	34.80	117.57 OK	3.51 OK	27	10 -245
88K77	ALDRIN	29.6	0.00	35.90	121.28 OK	37.00	125.00 OK	3.02 OK	25	10 -265
NYTEST #	DIELDRIN	74.1	0.00	90.40	122.00 OK	94.90	128.07 OK	4.85 OK	28	10 -195
001	ENDRIN	74.1	0.00	88.20	119.03 OK	93.40	126.05 OK	5.73 OK	23	10 -185
	4,4- DDT	74.1	0.00	92.60	124.97 OK	96.30	129.96 OK	3.92 OK	21	10 -300

OF % MS/MSD 0 OF 12

PEST OUT: ___

OF RPD 0 OF 6

PEST OUT: ___

3 D

NYTEST ENVIRONMENTAL INC.

PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

LOGIN #: 3871 MATRIX: WATER PAGE: 1

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug)	SAMPLE RESULT	CONC. MS	% RECOVERY	CONC. MSD	% RECOVERY	RPD	QC LIMITS RPD	QC LIMITS RECOVERY
	LINDANE	1	0.00	0.60	60.00 OK	0.51	51.00 OK	16.22 OK	18	10 -265
SAMPLE #	HEPTACHLOR	1	0.00	0.62	62.00 OK	0.52	52.00 OK	17.54 OK	22	10 -230
88-010	ALDRIN	1	0.00	1.05	105.00 OK	0.93	93.00 OK	12.12 OK	23	10 -240
NYTEST #	DIELDRIN	2.5	0.00	0.95	38.00 OK	0.91	36.40 OK	4.30 OK	14	10 -235
3849014	ENDRIN	2.5	0.00	2.23	89.20 OK	1.94	77.60 OK	13.91 OK	16	10 -250
	4,4- DDT	2.5	0.00	3.65	146.00 OK	2.98	119.20 OK	20.21 OK	23	10 -300

OF % MS/MSD 0 OF 12
PEST OUT: —

OF RPD 0 OF 6
PEST OUT: —

GC/MS TUNING AND MASS CALIBRATION
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Contractor:NYTEST ENVIRONMENTAL INC.
Instrument ID: F Date:2/15/90
Lab ID: F0931 Data Release Authorized By: Time: 11:34

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	54.5
68	Less than 2.0% of mass 69	0.0 [0.0]*
69	Mass 69 relative abundance	58.
70	Less than 2.0% of mass 69	.2 [.4]*
127	40.0 - 60.0% of mass 198	46.9
197	Less than 1.0% of mass 198	.7
198	Base peak, 100% relative abundance	100.
199	5.0 - 9.0% of mass 198	6.5
275	10.0 - 30.0% of mass 198	25.9
365	Greater than 1.00% of mass 198	3.12
441	Present, but less than mass 443	12.9
442	Greater than 40.0% of mass 198	91.2
443	17.0 - 23.0% of mass 442	16.7 [18.3]**

* Value in parenthesis is % mass 69.
** Value in parenthesis is % mass 442.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
PERFORMANCE STANDARD	F0931	2/15/90	11:34
WORKING STANDARD	F0932	2/15/90	11:59
SSTD020	F0933	2/15/90	13:41
SSTD080	F0934	2/15/90	14:44
SSTD120	F0935	2/15/90	15:56
SSTD160	F0936	2/15/90	16:59

GC/MS TUNING AND MASS CALIBRATION
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Contractor:NYTEST ENVIRONMENTAL INC.
Instrument ID: F Date: 3/16/90 Time: 13:25
Lab ID: F1309 Data Release Authorized By:

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	57.2
68	Less than 2.0% of mass 69	0.0 [0.0]*
69	Mass 69 relative abundance	50.0
70	Less than 2.0% of mass 69	0 .0 [0.0]*
127	40.0 - 60.0% of mass 198	43.4
197	Less than 1.0% of mass 198	0.5
198	Base peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	5.9
275	10.0 - 30.0% of mass 198	19.7
365	Greater than 1.00% of mass 198	2.03
441	Present, but less than mass 443	6.1
442	Greater than 40.0% of mass 198	43.9
443	17.0 - 23.0% of mass 442	8.1 [18.5]**

* Value in parenthesis is % mass 69.
** Value in parenthesis is % mass 442.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
PERFORMANCE STANDARD	F1309	3/16/90	13:25
WORKING STANDARD	F1312	3/16/90	13:59
METHOD BLANK	F1311	3/16/90	16:22
LCC-1EL	71001EL	3/16/90	17:13
LCC-2EL	71002EL	3/16/90	18:04
LCC-3EL	71003EL	3/16/90	18:55
LCC-4EL	71004EL	3/16/90	19:47
LCC-5EL	71005EL	3/16/90	20:39
LCC-6EL	71006EL	3/16/90	21:33
LCC-7EL	71007EL	3/16/90	22:25
LCC-8EL	71008EL	3/16/90	23:18

GC/MS TUNING AND MASS CALIBRATION
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Contractor:NYTEST ENVIRONMENTAL INC.
Instrument ID: F Date: 3/17/90 Time: 0:59
Lab ID: F1321 Data Release Authorized By:

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	57.4
68	Less than 2.0% of mass 69	0.0 [0.0]*
69	Mass 69 relative abundance	40.0
70	Less than 2.0% of mass 69	0 .0 [0.0]*
127	40.0 - 60.0% of mass 198	43.0
197	Less than 1.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	7.3
275	10.0 - 30.0% of mass 198	20.1
365	Greater than 1.00% of mass 198	1.41
441	Present, but less than mass 443	6.9
442	Greater than 40.0% of mass 198	43.6
443	17.0 - 23.0% of mass 442	7.6 [17.5]**

* Value in parenthesis is % mass 69.
** Value in parenthesis is % mass 442.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
PERFORMANCE STANDARD	F1321	3/17/90	0:59
WORKING STANDARD	F1323	3/17/90	1:31
LCC-9EL	71009EL	3/17/90	3:17
LCC-10EL	71010EL	3/17/90	4:09
LCC-11EL	71011EL	3/17/90	5:01
LCC-12EL	71012EL	3/17/90	5:55
LCC-1	3871001	3/17/90	7:38
LCC-2	3871002	3/17/90	8:32
LCC-3	3871003	3/17/90	9:25
LCC-4	3871004	3/17/90	10:16

GC/MS TUNING AND MASS CALIBRATION
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Contractor:NYTEST ENVIRONMENTAL INC.
Instrument ID: F Date: 3/17/90 Time: 15:54
Lab ID: F1335 Data Release Authorized By:

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	58.9
68	Less than 2.0% of mass 69	0.0 [0.0]*
69	Mass 69 relative abundance	60.0
70	Less than 2.0% of mass 69	0 .0 [0.0]*
127	40.0 - 60.0% of mass 198	44.6
197	Less than 1.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	6.6
275	10.0 - 30.0% of mass 198	19.4
365	Greater than 1.00% of mass 198	1.62
441	Present, but less than mass 443	7.3
442	Greater than 40.0% of mass 198	45.9
443	17.0 - 23.0% of mass 442	8.0 [17.4]**

* Value in parenthesis is % mass 69.
** Value in parenthesis is % mass 442.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
PERFORMANCE STANDARD	F1335	3/17/90	15:54
WORKING STANDARD	F1336	3/17/90	16:12
METHOD BLANK	F1338	3/17/90	17:57
LCC-5	3871005	3/17/90	18:50
LCC-6	3871006	3/17/90	19:42
LCC-7	3871007	3/17/90	20:35
LCC-8	3871008	3/17/90	21:28
LCC-9	3871009	3/17/90	22:22
LCC-10	3871010	3/17/90	23:15
LCC-11	3871011	3/18/90	00:08
LCC-12	3871012	3/18/90	00:59

CONVERSATION RECORD

TIME 1300 PM | DATE 5 JAN 90

TYPE ☐ VISIT ☐ CONFERENCE ☐ TELEPHONE ☐ INCOMING ☐ OUTGOING

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU	ORGANIZATION (Office, dept., bureau, etc.)	TELEPHONE NO.
SHERMAN S. BROWN (MR.)	EXXON CO.	201 474-0391

ROUTING	
NAME/SYMBOL	INT

SUBJECT Pre-App. by Exxon Company at BAYWAY Refinery - Arthur Kill at Linden, NJ.

SUMMARY

I contacted Mr. Brown in light of the recent oil spill in the vicinity of the proposed project area. I indicated to him the potential problem with sediment tested prior to the spill. He indicated that to his knowledge the samples have yet to be taken. He will confirm this with the appropriate people and inform us in writing.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
Steve Nagy		5 JAN 90

ACTION TAKEN

SIGNATURE	TITLE	DATE

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

NOV 30 1989

Operations Division
Regulatory Branch

SUBJECT: Sampling scheme and required testing for a Pre-application by the Exxon Company, U.S.A., at the Bayway Refinery, in the Arthur Kill, at Linden, Union County, NJ

Mr. S. C. Brown
Exxon Company U.S.A.
Refining Department
Bayway Refinery
P.O. Box 222
Linden, New Jersey 07036-0222

Dear Mr. Brown:

Enclosed please find a sediment sampling scheme and required testing checklist for the subject application.

To ensure that the laboratory you select to perform this testing is a USEPA approved laboratory for ocean disposal testing, it is recommended that you contact the undersigned at telephone (212) 264-0184 for confirmation.

Sincerely,

George Nieves
Ocean Disposal Project Manager,
Western Permits Section

Enclosures

CENAN-OP-W 9 November 1989

MEMORANDUM FOR: Chief, Regulatory Branch

SUBJECT: Sampling Scheme for a Pre-application by the Exxon Co. Inc., Bayway Refinery in the Arthur Kill

1. As requested in your memo received 11 Sep 89, a sediment sampling scheme and list of required testing for the proposed dredging project are enclosed. The delay in our response is due to the fact that the maps enclosed initially were incorrect. Corrected maps were submitted to us by the project manager on 18 Oct 1989, with additional location maps provided on 9 Nov 89.

2. The project consists of two barge docks which are to be dredged to a depth of 23+2 feet below the plane of MLW. Approximately 8,400 cubic yards are proposed for disposal at the Mud Dump Site. The project had previously been tested under ocean disposal testing requirements in August 1982, and had been dredged in June 1985 under DA Permit No. 12883.

3. As indicated on the attached map, twelve sediment core samples must be collected. Cores are to be taken to the project depth of 23+2 feet below MLW, and are to be combined into one composite sample for bioassay testing.

4. Since the project is located in the northern part of the Arthur Kill, both suspended particulate and solid phase bioassays must be performed, and tissue and water must be analyzed for DDT. Also, since the project is located in an area suspected to be contaminated with 2,3,7,8-TCDD, bulk sediment testing for 2,3,7,8-TCDD is required on each core sample composite using a detection limit of 1 part per trillion. All testing requirements are summarized in the attached list.

5. Please notify CENAN-OP-W regarding which bioassay and analytical laboratories are going to be used by the applicant in order to ensure that the facility, or facilities, has been inspected by the New York District and is qualified to do the required testing. Testing for 2,3,7,8-TCDD must be performed by an approved USEPA laboratory that can analyze for 2,3,7,8-TCDD at the required detection limit. A list of possible laboratories is attached. Please coordinate with CENAN-OP-W prior to initiation of testing to ensure that the selected laboratory is currently approved by USEPA.

6. Questions concerning either the sampling scheme, required testing or laboratories should be addressed to Oksana Yaremko at x5621.

JOHN F. TAVOLARO
Chief, Water Quality
Compliance Branch

Enclosures

REQUIRED TESTING
For
Ocean Disposal of Dredged Material

Applicant EXXON CO. INC. - BAYWAY REFINERY Appl.No. PRE-APP

Address P.O. BOX 222, LINDEN NJ 07036-0222

Waterway ARTHUR KILL (NORTH)

Proposed Volume: 8,400 cu.yds.

A meeting was held on <NOT HELD> at NYD offices in New York.

The sampling and testing scheme described below was approved for the proposed project area based upon the information contained in the attached map.

Testing will be performed by the following labs:
Biological: ? Analytical: ?

SAMPLING SCHEME

12 sample sites, as indicated on attached map (cores to project depth)

REQUIRED TESTING

1. GRAIN SIZE ANALYSIS
(% sand, % silt, % clay)
   a. ✓ Test sediment from each sample site
   (NOTE: If stratification is observed, each layer within a core must be analyzed separately)
   b. ✓ Reference sediment
   c. ✓ Control sediment

2. BULK SEDIMENT ANALYSIS
(NOTE: On test sediment from each sample site)
   a. ✓ Copper
   b. ✓ Nickel
   c. ✓ Zinc
   d. ✓ % Total Organic Carbon
   e. ✓ % Moisture
   f. ✓ 2,3,7,8-TCDD (required detection limit: 1 part per trillion)

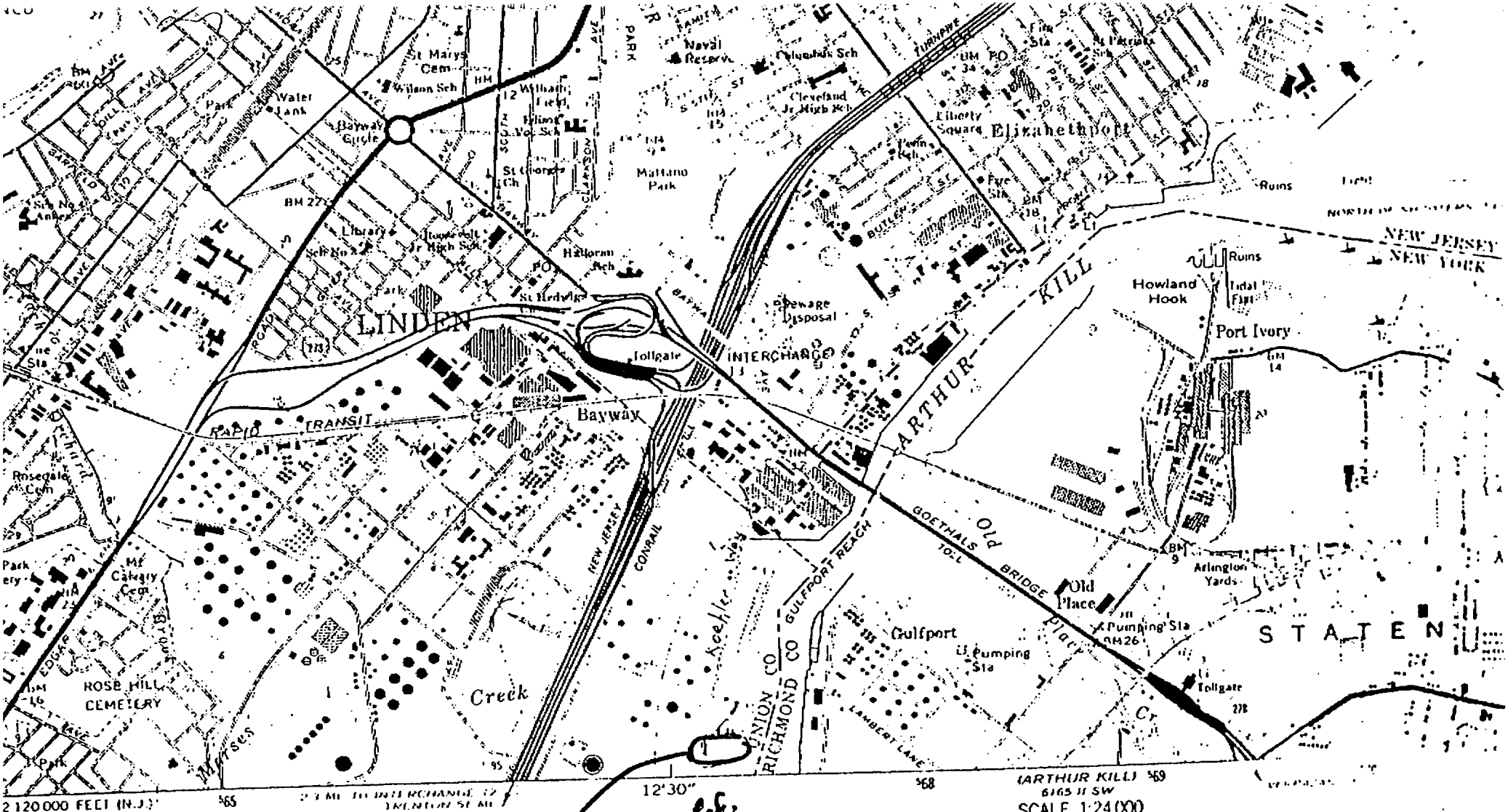
3. BIOASSAYS
   a. ___ Suspended Particulate Phase (A.tonsa, M.bahia, M.menidia)
   b. ___ Standard Toxicant Analysis (A.tonsa, M.bahia, M.menidia)
   c. ✓ 10-Day Solid Phase (P.pugio, M.mercenaria, N.virens)

4. BIOACCUMULATION ANALYSIS
   a. ✓ Petroleum hydrocarbons
   b. ✓ PCBs
   c. ✓ Mercury
   d. ✓ Cadmium
   e. ✓ DDT
   f. ___

5. CHEMICAL ANALYSIS OF SITE WATER & ELUTRIATE
   a. ✓ Petroleum hydrocarbons
   b. ✓ PCBs
   c. ✓ Mercury
   d. ✓ Cadmium
   e. ✓ DDT
   f. ___

PREPARED BY: Oksana Yaremko
CENAN-OP-W
26 October 1989

Attachment

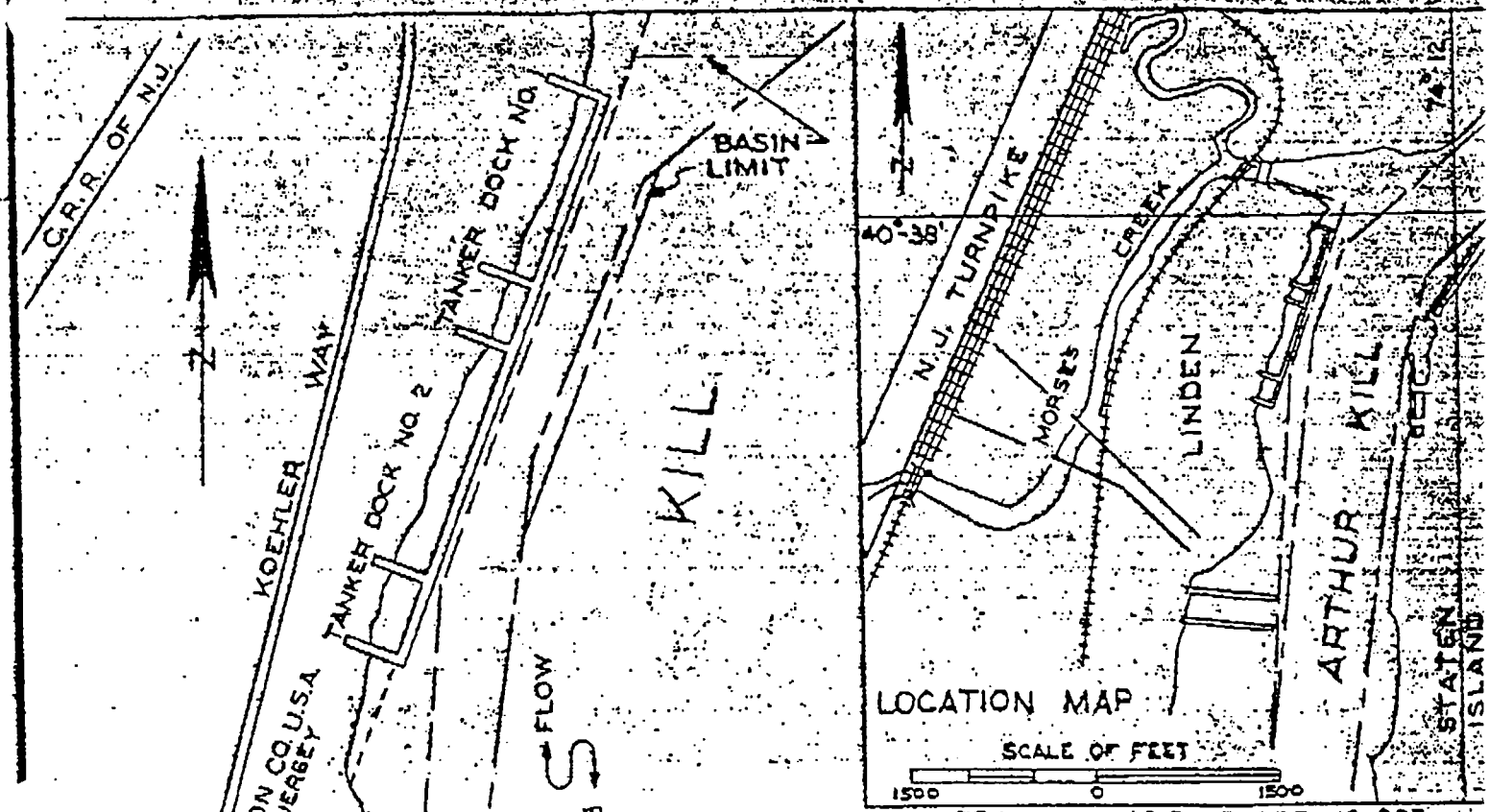


and published by the Geological Survey
ration with New York Department

)S/NOAA, USCE, and New Jersey Geodetic Survey
rammetric methods and from NOS charts T-5106,
-5332, T-5467, T-5468, and T-5469
grammetric methods from aerial photographs
ietable surveys 1955
hotographs taken 1966. Field checked 1967
ic data compiled from NOS charts 285 (1966),
9 (1967). This information is not intended
oses
. 10,000-foot grid ticks based on New Jersey coordinate
ik coordinate system, Long Island zone. 1000-meter
Mercator grid ticks, zone 18, shown in blue
n Datum. To place on the predicted North
83 move the projection lines 6 meters south and
hown by dashed corner ticks

EXXON Co. (Pre App) Map 1 of 3

EXXON Co. (PreApp)
Map 2 of 3



NOTES:

1. SOUNDINGS AND ELEVATIONS ARE IN FEET AND REFER TO MEAN LOW WATER
2. APPROXIMATELY 53,000 CUBIC YDS. TO BE DREDGED AND DISPOSED OF AT SEA, AT A LOCATION DESIGNATED BY U.S. CORPS OF ENGINEERS.

PROPOSED DREDGING

IN ARTHUR KILL

AT LINDEN

COUNTY OF UNION

STATE OF N. J.

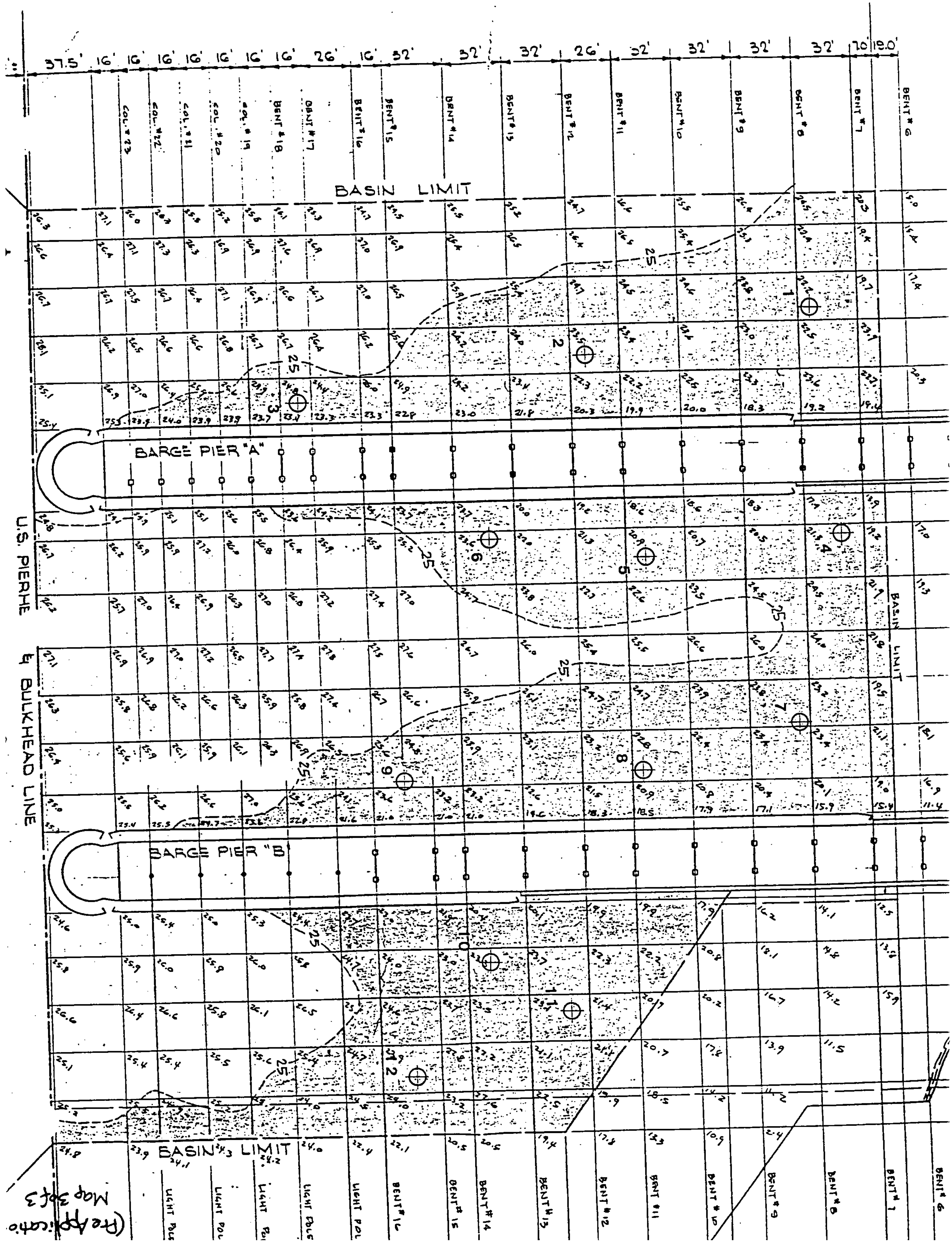
APPLICATION BY EXXON CO. U.S.

PLAN

SCALE OF FEET

400 0 400

DATE


37.5' 16' 16' 16' 16' 16' 16' 16' 26' 16' 32' 32' 32' 26' 32' 32' 32' 32' 20' 19.0'
COL. #23
COL. #22
COL. #21
COL. #20
COL. #19
BENT #18
BENT #17
BENT #16
BENT #15
BENT #14
BENT #13
BENT #12
BENT #11
BENT #10
BENT #9
BENT #8
BENT #7
BENT #6
BASIN LIMIT
BARGE PIER "A"
BARGE PIER "B"
U.S. PIERHE
BULKHEAD LINE
BASIN LIMIT
LIGHT POLE
(Pre Applicatio
Map 3 of 3

DIOXINS

American Analytical & Technical Services, Inc. (AATS) 68-01-6933 (WA 84-A002)
10926 E. 55th Place
Tulsa, OK 74146
918/665-2069

Robert Harris, Sample Scheduling-SAS Bids
Jack Wright, Sample Scheduling (Alt.)-SAS Contracts
Jong Pyng Hsu, Organic Lab Manager
Fred Morley, Invoicing

Biospherics, Inc. (BIO) 68-01-6930 (WA 84-A002)
4928 Wyaconda Road
Rockville, MD 20852
301/770-7700

John Yarko, Sample Scheduling
Nancy Cargill, Sample Scheduling (Alt.)
Frank Fitzpatrick, Sample Scheduling (Alt.)

California Analytical Labs, Inc. (CAL) 68-01-6916 (WA 84-A002)
2544 Industrial Boulevard
West Sacramento, CA 95691
916/372-1393

Dr. Paul Taylor, President-SAS Contracts
Dr. Michael Miille, SAS Bids
Bob Hart, Sample Scheduling-SAS Bids (Alt.)
Bonnie McNeill, Sample Scheduling (Alt.)
Ruby Ulrich, Invoicing

CompuChem Laboratories (COMPU) 68-01-6915 (WA 84-A002)
3308 Chapel Hill/Nelson Highway
Research Triangle Park, NC 27709
919/549-8263
(Mailing Address: P.O. Box 12652)

Kevin McConnaghy, Project Manager-SAS Contracts
Jill Henes, Project Scientist
Richard Bloom, Sample Scheduling
Selena Flynt, Invoicing

Envirodyne Engineers (ENV) 68-01-6917 (WA 84-A002)
12161 Lackland Road
St. Louis, MO 63146
314/434-6960

Dr. David C. Kennedy, Vice President-Office Manager-SAS Contracts
Will Soloman, Sample Scheduling-SAS Bids (Alt.)
Judy Stone, Document Control-Sample Scheduling-SAS Bids
Margaret Winter, SAS Bids (Alt.)
Dorothy Haupt, Invoicing

DIOXINS (continued)

Environmental Testing and Certification Corp. (ETC) — 68-01-6918 (WA 84-A002)
284 Raritan Center Parkway
Edison, NJ 08837
201/225-5600

Jack Farrell, Project Manager
Diane Foster, Sample Scheduling-SAS Bids
Dr. Denis Lin, SAS Contracts
Arlene Patrick, Invoicing

Geochem Research Inc. (GEO) — 68-01-6931 (WA 84-A002)
16920 Park Row
Houston, TX 77084
713/492-2510

Dr. Charles Bohnstedt, Sample Scheduling-Invoicing
Brenda La Cille, Sample Scheduling (Alt.)
Louis Seims, Sample Scheduling (Alt.)

Hazleton Laboratories, Inc. (HAZLET) — 68-01-6913 (WA 84-A002)
3301 Kinsman Boulevard
Madison, WI 53704
608/241-4477
(Mailing Address: P.O. Box 7545)

Robert Conway, SAS Contracts
Dave Hills, Sample Scheduling-SAS Bids (Ext. 353)
Dr. Emilio Sturino, Sample Scheduling (Alt.)
Mark Hottinger, Invoicing

Laucks Testing Laboratories, Inc. (LAUCKS) — 68-01-6932 (WA 84-A002)
940 S. Harney Street
Seattle, WA 98108
206/767-5060

Dr. Michael Nelson, Sample Scheduling
Barbara McNatt, Sample Scheduling (Alt.)
Charlene Nix, Sample Scheduling (Alt.)
Mary Taylor, Invoicing

O'Brien & Gere Engineers, Inc. (OBRIEN) — 68-01-6934 (WA 84-A002)
1304 Buckley Road
Syracuse, NY 13221
315/451-4700
(Mailing Address: P. O. Box 4873)

Antonio LoSurdo, Sample Scheduling-SAS Bids
David R. Hill, Sample Scheduling (Alt.)-SAS Contracts
Barbara Pauling, Sample Scheduling (2nd Alt.)

DIOXINS (continued)

Rocky Mountain Analytical Laboratory, Inc. (RMAL) 68-01-6914 (WA 84-A002)
5530 Marshall Street
Arvada, CO 80002
303/421-6611

Dr. Mark J. Carter, President-SAS Contracts
Ken Faust, Sample Scheduling-SAS Bids (Alt.)
Dr. John Logsdon, Sample Scheduling (Alt.)-SAS Bids

U.S. Testing Company, Inc. (USTEST) 68-01-6935 (WA 84-A002)
1415 Park Avenue
Hoboken, NJ 07030
201/792-2400

Richard D. Posner, Vice President-SAS Contracts
A. Tordini, Project Manager-SAS Bids-Technical Contact
Eli Paxot, Sample Scheduling (Ext. 325)
Jane Landsberg Dunn, Invoicing-Document Control

Versar, Inc. (VERSAR) 68-01-6929 (WA 84-A002)
6850 Versar Center
Springfield, VA 22151
703/750-3000

Charlie Carter, Sample Scheduling
Sue Haessler, Invoicing

NON-IFB SAS

For use if insufficient number of IFB laboratories are available for competition.

Dioxin:

Battelle-Columbus Labs
505 King Avenue
Columbus, OH 43201
614/424-6424

Dr. David L. Miller, Dioxin Lab Manager-SAS Bids-Sample Scheduling (X6490)
Michael Sewell, SAS Contracts
Dr. Fred DeRoos, Sample Scheduling (Alt.) (X4247)
Gregory Krager, Accounts Receivable

IIT Research Institute
Chemistry Division
10 West 35th Street
Chicago, IL 60616
312/567-4000

Dr. Jack O'Neill, Sample Scheduling (Alt.) (X4267)
Mike Miller, SAS Bids-Sample Scheduling
T. R. Plonis, SAS Contracts
Kirit Parikh, Sample Scheduling (Alt.)-QA Officer (X4380)

IT Corporation
312 Directors Drive
Knoxville, TN 37923
615/690-3211

Stan Wojinski

Midwest Research Institute
425 Volker Boulevard
Kansas City, MO 64110
816/753-7600

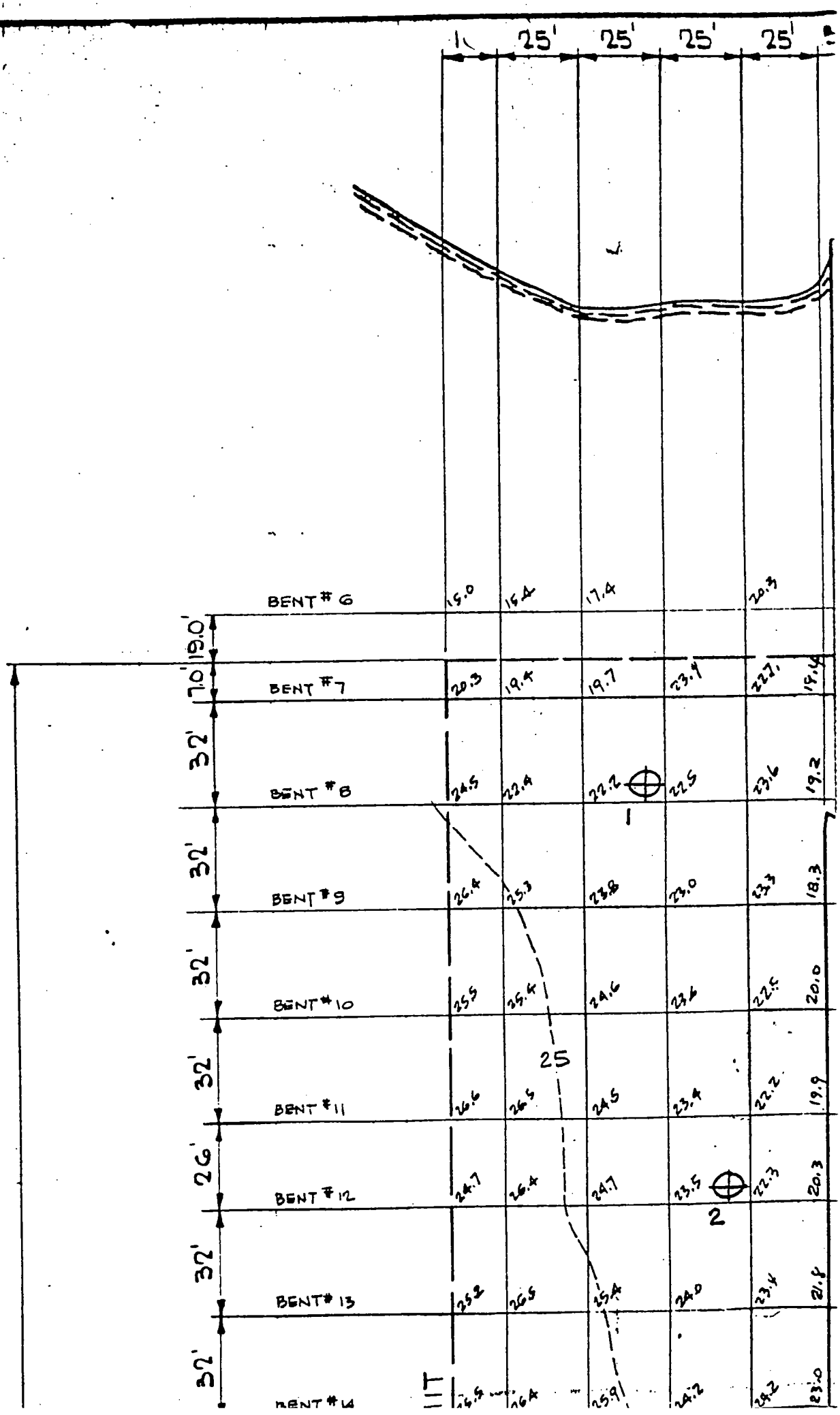
Dr. John Stanley, SAS Bids-Sample Scheduling
Dr. John Going, Sample Scheduling (Alt.)
Robert Donaldson, SAS Contracts

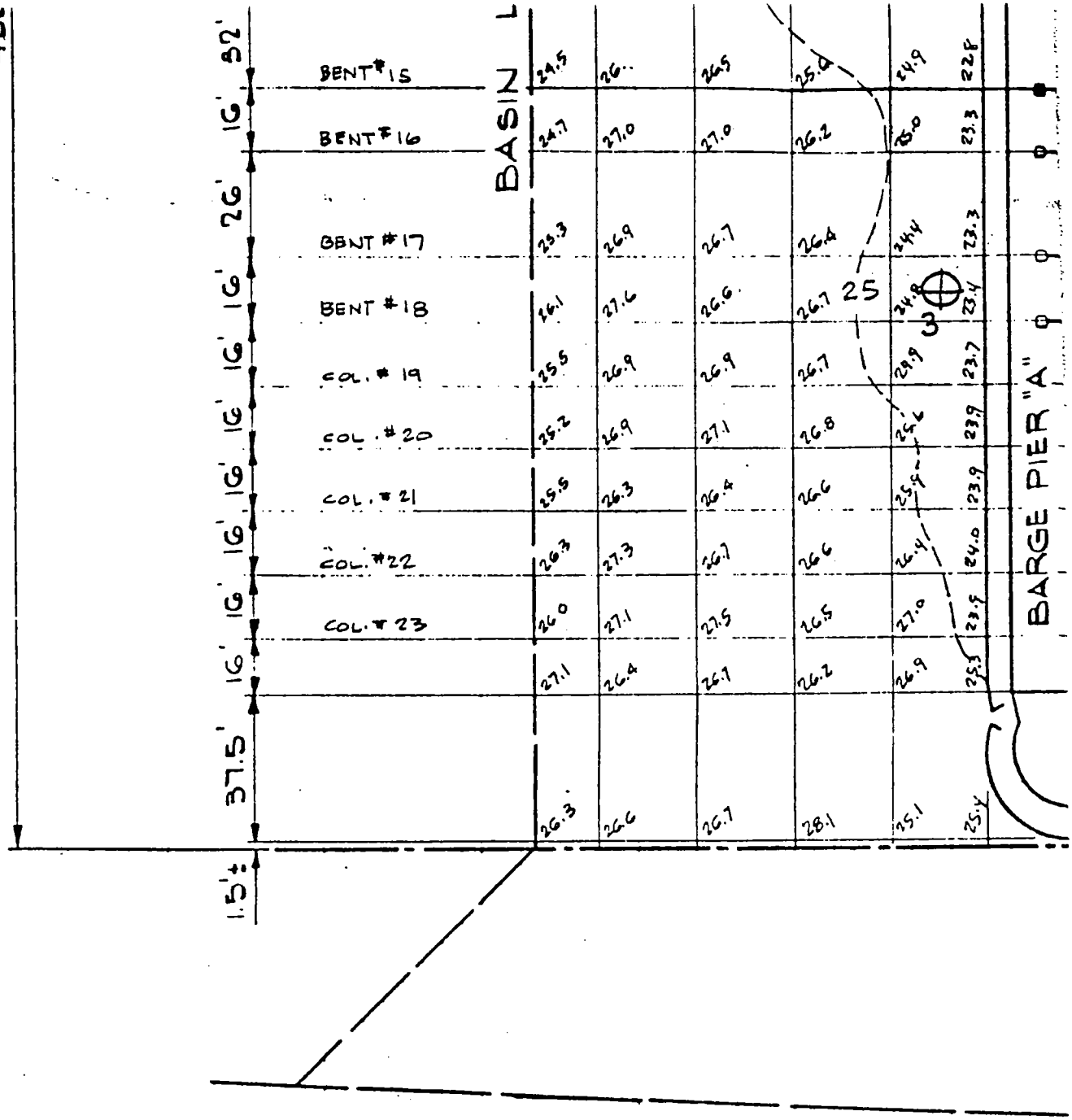
Triangle Laboratories
4915 Prospectus Drive, Suite F
Research Triangle Park, NC 27709
919/544-5729

Dr. Ron Hass
Caroline Hass, Invoicing

Wright State University
Brehm Laboratory
3640 Colonel Glenn Road
Dayton, OH 45435
513/873-2202 (Direct)
513/873-3333 (University Operator)

Dr. Thomas O. Tiernan, SAS Contracts-SAS Bids-Sample Scheduling
Dr. Michael Taylor, Sample Scheduling (Alt.)-SAS Bids (Alt.)

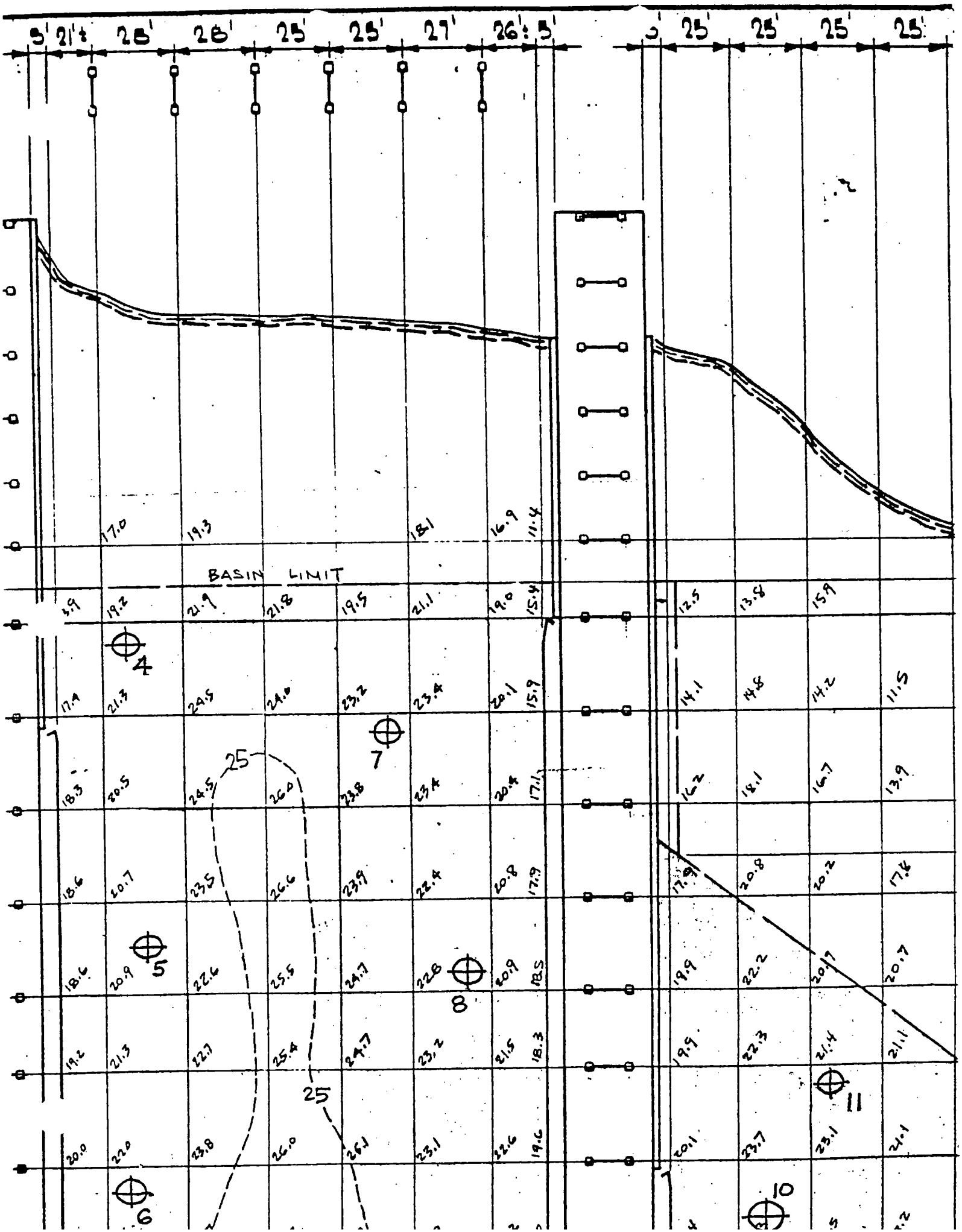

25'
25'
25'
25'
BENT # 6
BENT # 7
BENT # 8
BENT # 9
BENT # 10
BENT # 11
BENT # 12
BENT # 13
19.0'
7.0'
32'
32'
32'
32'
26'
32'
32'
25
1
2
15.0
16.4
17.4
20.3
20.3
19.4
19.7
23.4
22.1
19.4
24.5
22.4
22.2
22.5
23.6
19.2
26.4
25.3
23.8
23.0
23.3
18.3
25.5
25.4
24.6
23.6
22.5
20.0
26.6
26.5
24.5
23.4
22.2
19.9
24.7
26.4
24.7
23.5
22.3
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24.2
23.2
23.0

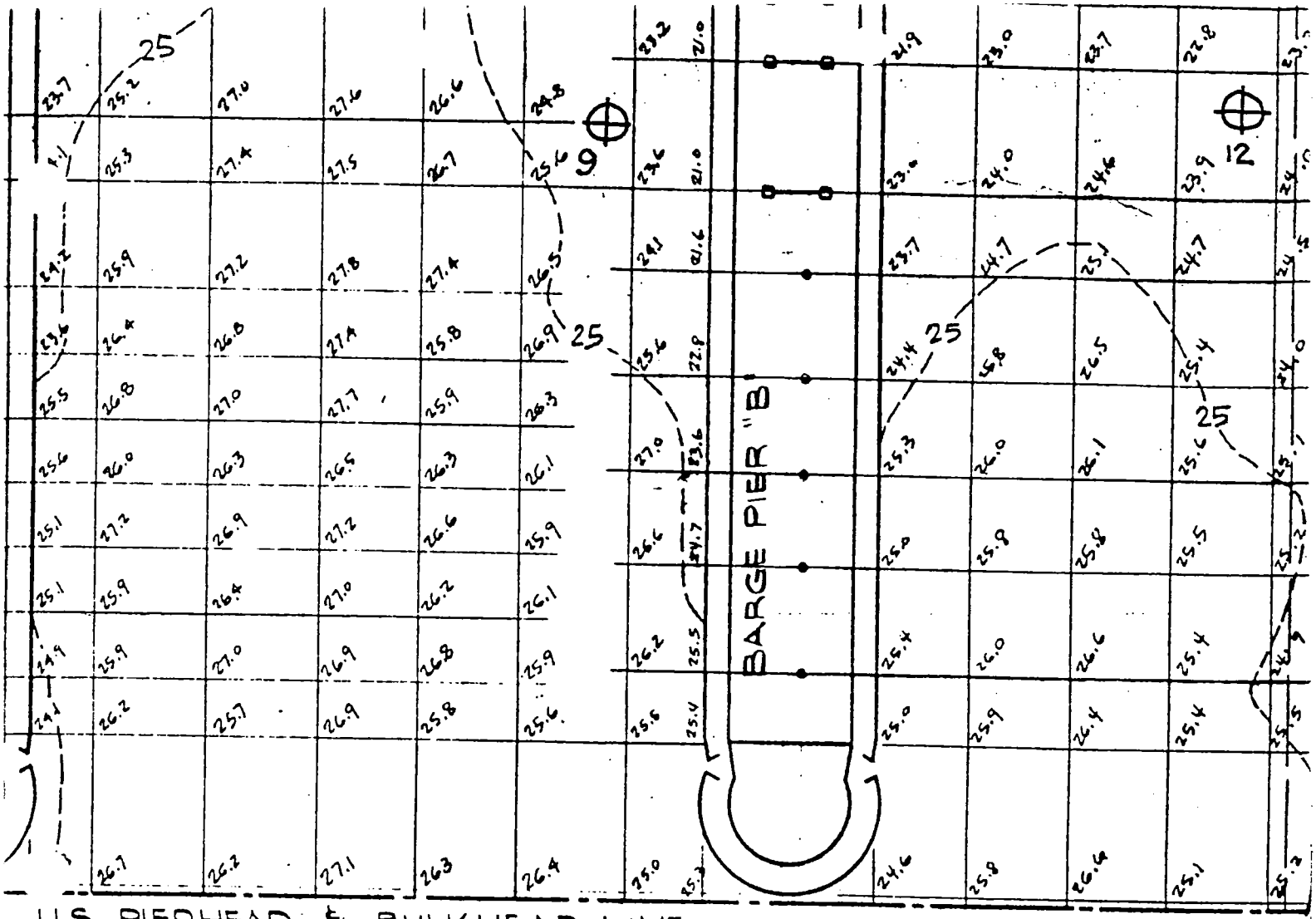


ARTHUR

DRAWN	CHK'D.	GROUP SUP.	PROJ ENG	OPER DEPT	MECH DES	DATE	REV. 7	DRAWN	CHK'D	GROUP SUP	PROJ ENG	OPER DEPT	MECH DES	DATE	REV 6

58-0023 E


5' 21' 25' 25' 25' 25' 27' 26' 5'
5' 25' 25' 25' 25'
17.0 19.3 18.1 16.9 11.4
BASIN LIMIT
4.9 19.2 21.9 21.8 19.5 21.1 19.0 15.4 12.5 13.8 15.9
4
17.9 21.3 24.5 24.0 23.2 23.4 20.1 15.9 14.1 14.8 14.2 11.5
7
25
18.3 20.5 24.5 26.0 23.8 23.4 20.4 17.1 16.2 18.1 16.7 13.9
18.6 20.7 23.5 26.6 23.9 22.4 20.8 17.9 17.9 20.8 20.2 17.8
18.6 20.9 22.6 25.5 24.7 22.8 20.9 18.5 19.9 22.2 20.9 20.7
5
8
19.2 21.3 22.7 25.4 24.7 23.2 21.5 18.3 19.9 22.3 21.4 21.1
25
11
20.0 22.0 23.8 26.0 26.1 23.1 22.6 19.6 20.1 23.7 23.1 21.1
6
10



U.S. PIERHEAD & BULKHEAD LINE

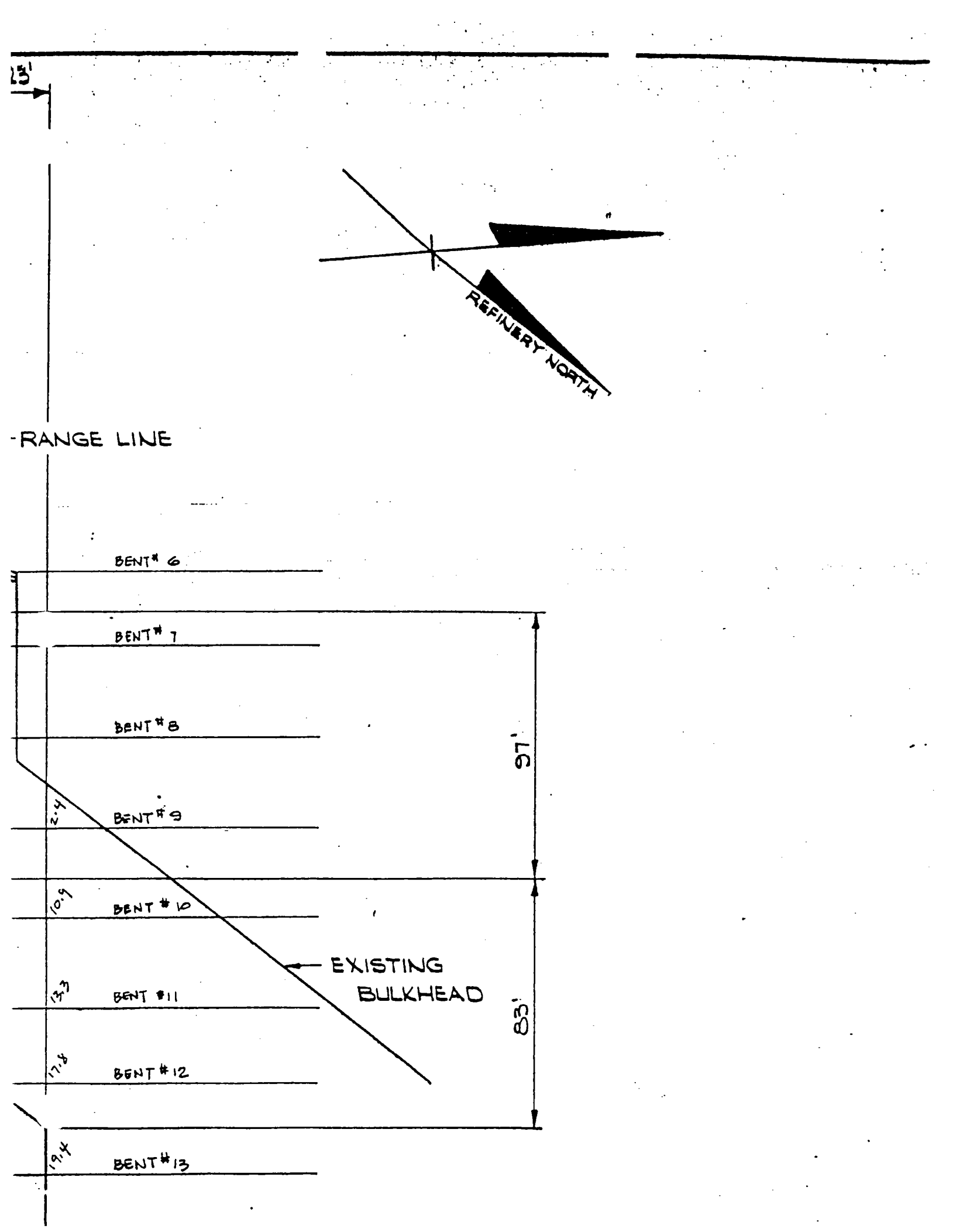
⊕ = 12 SAMPLING LOCATIONS FOR BIOASSAY TESTING.

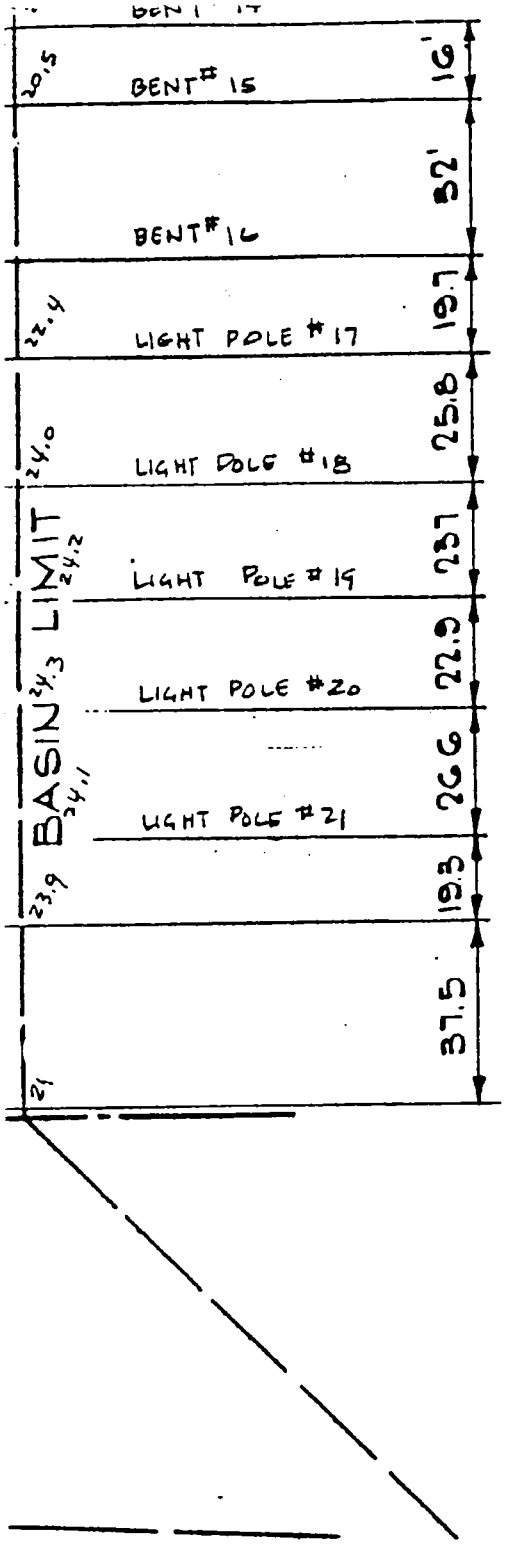
Rosana Yarmolko
CENAN-OP-W
26 Oct 89

WEST CHANNEL LINE

KILL

						REV.								REV.		
'D	GROUP SUP	PROJ ENG	OPER DEPT	MECH DES	DATE	5	DRAWN	CHK'D.	GROUP SUP	PROJ ENG	OPER DEPT	MECH DES	DATE	4	DRAWN	CHK'D


25'
REFINERY NORTH
-RANGE LINE
BENT# 6
BENT# 7
BENT# 8
BENT# 9
BENT # 10
BENT #11
BENT #12
BENT#13
2.4
10.9
13.3
17.8
19.4
97'
83'
EXISTING
BULKHEAD



DREDGE QUANTITI

SOUTH OF PIER "A" --
BETWEEN PIERS "A+B" --
NORTH OF PIER "B" --

TOTAL --

DREDGE DEPTH - 25.0

SOUNDINGS TAKEN BY EXX
SURVEY PERSONAL USING
RAYTHEON FATHOMETER
MODEL NO. 719C

DATE: JUNE 20/23/27, 19

REV.	DRAWN	CHK'D.	GROUP SUP	PROJ. ENG	OPER. DEPT	MECH. DES.	DATE	REV.	DRAWN	CHK'D
3								2		

NOTES:

1. ALL ELEV'S SHOWN ARE MINUS (-) ELEV'S.
2. BAYWAY DATUM USED, TO CONVERT TO U.S.G DATUM SUBTRACT 2.35'

(-25.0)

10 CU.YDS.
1,330 CU.YDS.
2,260 CU.YDS.

3,400 CU.YDS.

TECHNICAL DIVISION

BAYWAY REFINERY
LINDEN, NEW JERSEY

THIS DRAWING IS THE PROPERTY OF:

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION
REFINING DEPARTMENT

AND IS LENT WITHOUT CONSIDERATION OTHER THAN THE BORROWER'S AGREEMENT THAT IT SHALL NOT BE REPRODUCED, COPIED, LENT OR DISPOSED OF DIRECTLY OR INDIRECTLY NOR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SPECIFICALLY FURNISHED.

BARGE PIERS A & B

SOUNDING GRID

DRAWING	DATE	APPROVAL	DATE
SOUNDINGS LJK / GJF	JUNE 20,23,27 1989	MECHANICAL DESIGN	
DRAWN GJF	JUNE 29, 1989	PROJ. ENGINEER	
CHECKED		OPERATING DEPT.	
GROUP SUPERVISOR			

SCALE	DRAWING NUMBER	SHEET
1" = 40'-0"		1 OF 1

EXXON COMPANY, U.S.A.
POST OFFICE BOX 222 • LINDEN, NEW JERSEY 07036-0222

REFINING DEPARTMENT
BAYWAY REFINERY

RECEIVED
CORPS OF ENGINEERS
NEW YORK DISTRICT
OCT 13 2 27 PM '89

REGISTERED MAIL --
RETURN RECEIPT REQUESTED

October 5, 1989

Maintenance Dredging Barge Piers

Department of the Army
Operations Division
NY District, Corps of Engineers
26 Federal Plaza
New York, NY 10278-0090

Attention: George Nieves
Project Manager, Ocean Disposal
Western Permits Section

Dear Sir:

As per your request, included herein are two additional drawings dated June, 1989 showing the Exxon USA, Bayway Refinery Barge Pier dredge area. The area to be dredged is shaded on both drawings. Also, the dredge depth and calculated volume of dredge spoils is given on the drawings.

Your assistance is requested in locating sample sites so that we may begin the maintenance dredging permit renewal process. Please mark the location and number of samples you require and return one drawing to us. Since this process requires some time to complete and the failure to dredge impacts are severe, your prompt response to this request will be appreciated.

If you require additional information, please call me at (201) 474-6390.

Very truly yours,

S. C. Brown
Senior Staff Engineer

SCB/dh
Attachments

CENAN-OP-R

8 Sept 89

MEMORANDUM FOR: Chief, Water Quality Compliance Branch

SUBJECT: Request for Data Review and Analysis for a Pre-Application by the Exxon Company, Inc., Bayway Refinery in the Arthur Kill

1. We are requesting the following:

___ a. Analysis of the attached testing which has been submitted as part of the above application. Please indicate the completeness of the testing package and whether the proposed dredged material satisfies the Ocean Dumping Criteria.

____ b. Evaluation of the environmental significance of the mixing zone from the intentional barge overflow at the dredging site. This will be used in an evaluation of the proposed activity in accordance with the guidelines promulgated under Section 404(b)(1) of the Clean Water Act of 1972.

____ c. The presence of a Water Quality Compliance Section representative at a pre-application meeting with

_____

_____

_____.

XXXX d. A sampling scheme and checklist of required testing for the subject project as further described on the attached sheet.

____ e. Review of the attached draft public notice for completeness and accuracy.

____ f. Other.

2. It is requested that you respond within five (5) working days to allow our expeditious processing of this application.

GV
NIEVES

KK
KRAUSER

RJT
TOMER

SEEBODE

JOSEPH J. SEEBODE
Chief, Regulatory Branch

Attachments

AUG 14 REC'D

EXXON COMPANY, U.S.A.
POST OFFICE BOX 222 • LINDEN, NEW JERSEY 07036-0222

REFINING DEPARTMENT
BAYWAY REFINERY

REGISTERED MAIL --
RETURN RECEIPT REQUESTED

August 11, 1989

Maintenance Dredging Barge Piers

Department of the Army
Operations Division
NY District, Corps of Engineers
26 Federal Plaza
New York, NY 10278-0090

Attention: George Nieves
Project Manager, Ocean Disposal
Western Permits Section

Dear Sir:

On November 22, 1988, Exxon USA, Bayway Refinery submitted marked-up drawings showing sediment accumulation at our barge docks. Your assistance was requested in locating sample sites so that we could begin the maintenance dredging permit renewal. Your response letter requests additional information. While some of this information can only be properly answered after sample results are available, we have submitted an initial response within this document.

1. Need for dredging:

   a. Volume, area, and extent of shoaling are shown on drawing dated June, 1984.9
   b. Failure to dredge will result in a refinery shutdown since sufficient other transport facilities do not exist to support minimum refinery throughput.

2. The following information addresses alternatives to ocean disposal:

   a. Interpier disposal -- the filling of slips between abandoned piers on the applicant's property. No abandoned piers or slips exist at Exxon's Bayway Refinery.
   b. There exists no vacant land within one mile of the dredge site at which the dredged material could be dewatered or disposed. If an upland site could be found, the material must be transported overland by truck in a semi-fluid state. The cost of upland/offsite disposal has been estimated to be five times the ocean disposal cost. The cost of upland/onsite disposal is estimated to be about four times the ocean disposal cost. These cost comparison estimates are included.

Please mark the location and number of samples you require with our maintenance dredging permit application and return one drawing to us.

If you require additional information, please call me at (201) 474-6390.

Very truly yours,

S. C. Brown

S. C. Brown
Senior Staff Engineer

SCB/dh
Attachments

O C E A N D I S P O S A L I N F O R M A T I O N S H E E T

APPLICATION NUMBER: None

WATERWAY: Arthur Kill--New Jersey

ACTIVITY: Maintenance Dredging

VOLUME: 2500 Cubic Yards

DEPTH: 25 Ft

AREA: 440 Ft by 450 Ft

LOCATION OF OUTFALLS: One NJPDES Outfall at our #1 Dam on Morses Mill Creek.

SPILLS IN VINCINITY:

DATE	MATERIAL SPILLED	QUANTITY SPILLED	DESCRIPTION
6/18/88	Slop oil	30 gal	Overflow of pier sump spilled oil onto water. Spill was cleaned.
7/2/87	Asphalt-unknown source	1 bbl	Not an EXXON spill,oil floated in with tide. Area cleaned by EXXON.
6/2/87	No 2 fuel oil	2 qts	A pressure guage failure at Pier A sprayed oil onto water. Sheen was cleaned up.
3/17/87	Diesel	1 gal	Failure of a relief valve connection sprayed oil. Sheen was cleaned up.
9/25/86	Asphalt-unknown source	1 bbl	Fugitive spill, no sources found on Piers. Oil was cleaned up.
12/17/85	Asphalt	40 gal	Onshore pipeline failure leaked oil to waterline. Oil was cleaned up.

METHODS OF DREDGING: Marine Clam Dredge

HISTORY/PAST PERMITS: This area was last dredged in June 1985 to 25 feet under permit No. 12883. The dredged material was ocean disposed.

BARGE PIER DREDGING ESTIMATE

CASE: Ocean Disposal

BASIS: Current Estimate
ASSUME: None

A.	Dredge time - normal -1 day	30,000
B.	Rent storage barge	20,000
C.	Miscellaneous labor - cleanup	4,000
	SUBTOTAL	54,000
	CONTINGENCY +-25%	13,500
	TOTAL	67,500

BARGE PIER DREDGING ESTIMATE

CASE: Upland Offsite Disposal

BASIS: Updated 3/14/80 Study Estimate
ASSUME: Suitable offsite disposal area could be found.
(No such area has been found to date.)

A.	Facilities required for truck operation on municipal highways.		
	1. Seal tail gates - custom gaskets		
	2. Seal top - accordian/liquid tight covers 2,400 $/Truck * 12 Trucks		28,800
	3. Truck washing facilities		8,000
	Concrete pad		16,000
	Settling basin		8,000
	Hydrant and pipe		
B.	Temporary docking facilities (south of Pier A)		80,000
	1. Piles, Timber, etc.		16,000
	2. Crane Pad (crane transfer from scow to trucks)		
C.	Operating Costs		
	1. Assume 15 CY trucks can only hold 8 CY of water/solids dredge spoils 2,500 CY spoils= 313 truck loads		
	2. Assume crane with 1.0CY bucket or 10 minutes to load one truck 313 truck lds/ 6 trucks/Hr= 52 hours or 7 days		30,000
	3. Dredge time - normal ~1 day		50,000
	4. Rent storage barge		25,200
	5. Trucks 12 trucks for 7 days @ $ 300 ea/day		4,900
	6. 200 Ton crane 7 days @ $ 700 per day		4,300
	7. Miscellaneous labor - cleanup		
		SUBTOTAL	271,200
		CONTINGENCY +-25%	67,800
		TOTAL	339,000

BARGE PIER DREDGING ESTIMATE

CASE: Upland Onsite Disposal

BASIS: Updated 3/14/80 Study Estimate
ASSUME: Suitable onsite disposal area could be found.
(No such area has been found to date.)

A. Facilities required for truck operation on municipal highways.

1. Seal tail gates - custom gaskets

2. Seal top - accordian/liquid tight covers
   2,400 $/Truck * 6 Trucks — 14,400

B. Temporary docking facilities (south of Pier A) — 80,000

1. Piles, Timber, etc. — 16,000

2. Crane Pad (crane transfer from scow to trucks)

C. Operating Costs

1. Assume 15 CY trucks can only hold 8 CY of water/solids dredge spoils
   2,500 CY spoils= 313 Truck loads

2. Assume crane with 1.0CY bucket or 10 minutes to load one truck
   312.5 truck lds/ 6 Trucks/Hr= 52 hours or 7 days — 30,000

3. Dredge time - normal -1 day — 50,000

4. Rent storage barge — 12,600

5. Trucks — 6 trucks for 7 days @ $ 300 ea/day — 4,900

6. 200 Ton crane — 7 days @ $ 700 per day — 4,100

7. Miscellaneous labor - cleanup

SUBTOTAL	212,000
CONTINGENCY + 25%	53,000
TOTAL	265,000

EXXON COMPANY, U.S.A.
POST OFFICE BOX 222 • LINDEN, NEW JERSEY 07036-0222

REFINING DEPARTMENT
BAYWAY REFINERY

November 22, 1988

Proposed Dredging - Barge Docks
Bayway Refinery, Arthur Kill,
Linden, New Jersey

Mr. George Nieves
Department of the Army
U.S. Army Engineer District, New York
26 Federal Plaza
New York, NY 10278

Dear Mr. Nieves:

Attached are two drawings showing soundings taken at our Barge Piers on the Arthur Kill in Linden, New Jersey. We wish to dredge sediment from the areas shaded in yellow on the drawings with ocean disposal of the dredge spoils.

Please mark the location and number of samples you require with our application for maintenance dredging with ocean disposal and return one drawing to us.

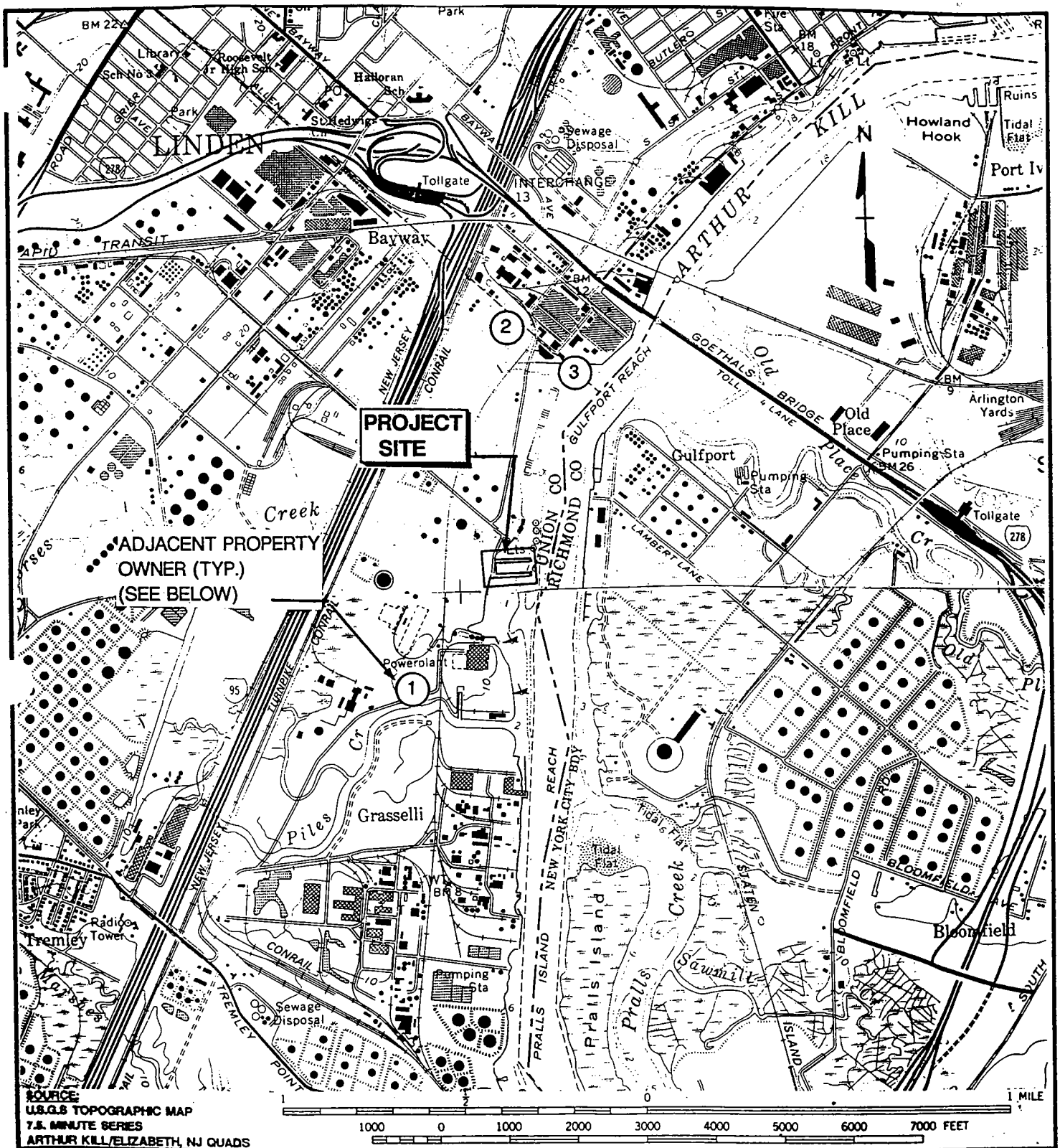
If you require additional information, please call me at (201) 474-6390.

Very truly yours,

S. C. Brown

S. C. Brown
Senior Staff Engineer

SCB/dh
Attachments



SOURCE:
U.S.G.S TOPOGRAPHIC MAP
7.5. MINUTE SERIES
ARTHUR KILL/ELIZABETH, NJ QUADS

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

PURPOSE: BARGE PIERS
MAINTENANCE DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

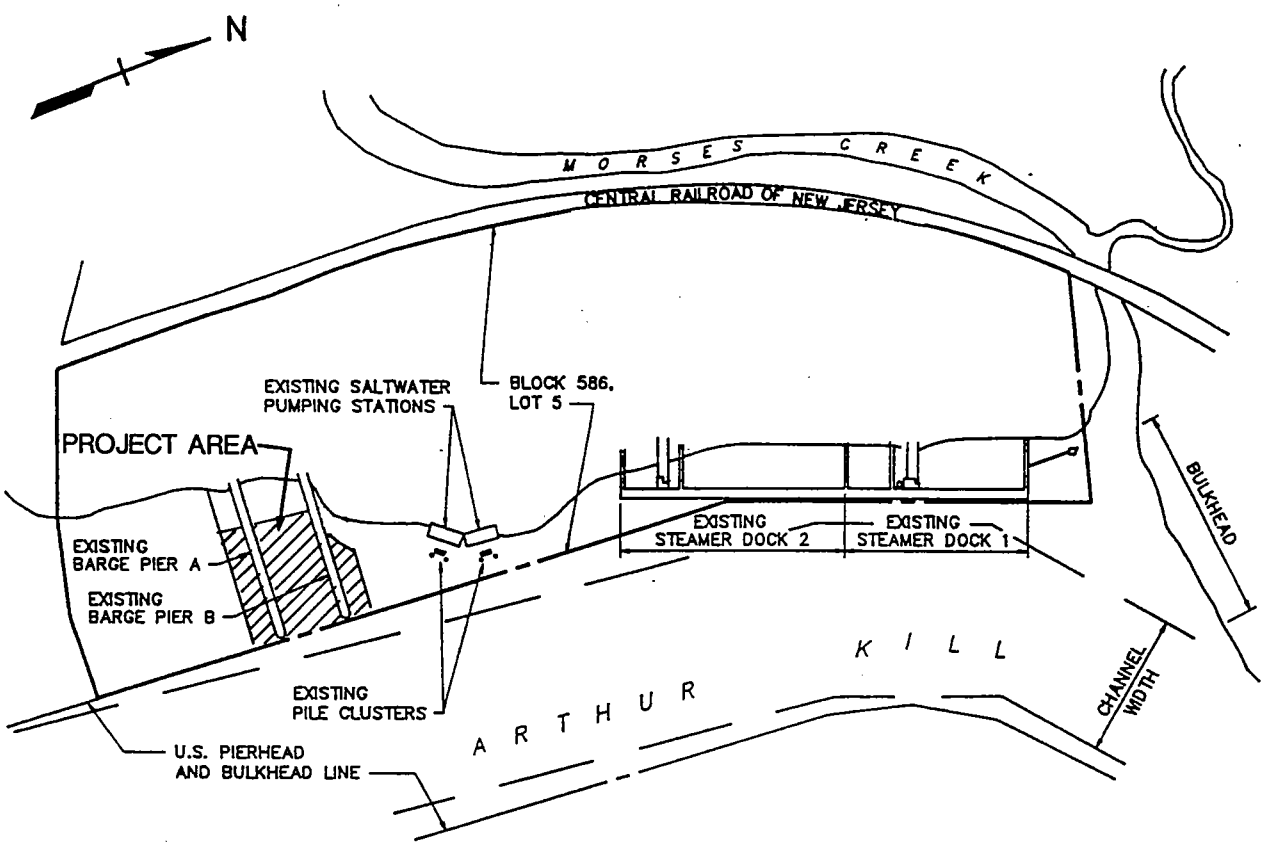
VICINITY MAP

EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY
MARINE PROJECTS

IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

SHEET 1 OF 4 DATE 1/8/92



PURPOSE: BARGE PIERS MAINTENANCE DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:

1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

LOCATION PLAN BARGE PIERS A AND B

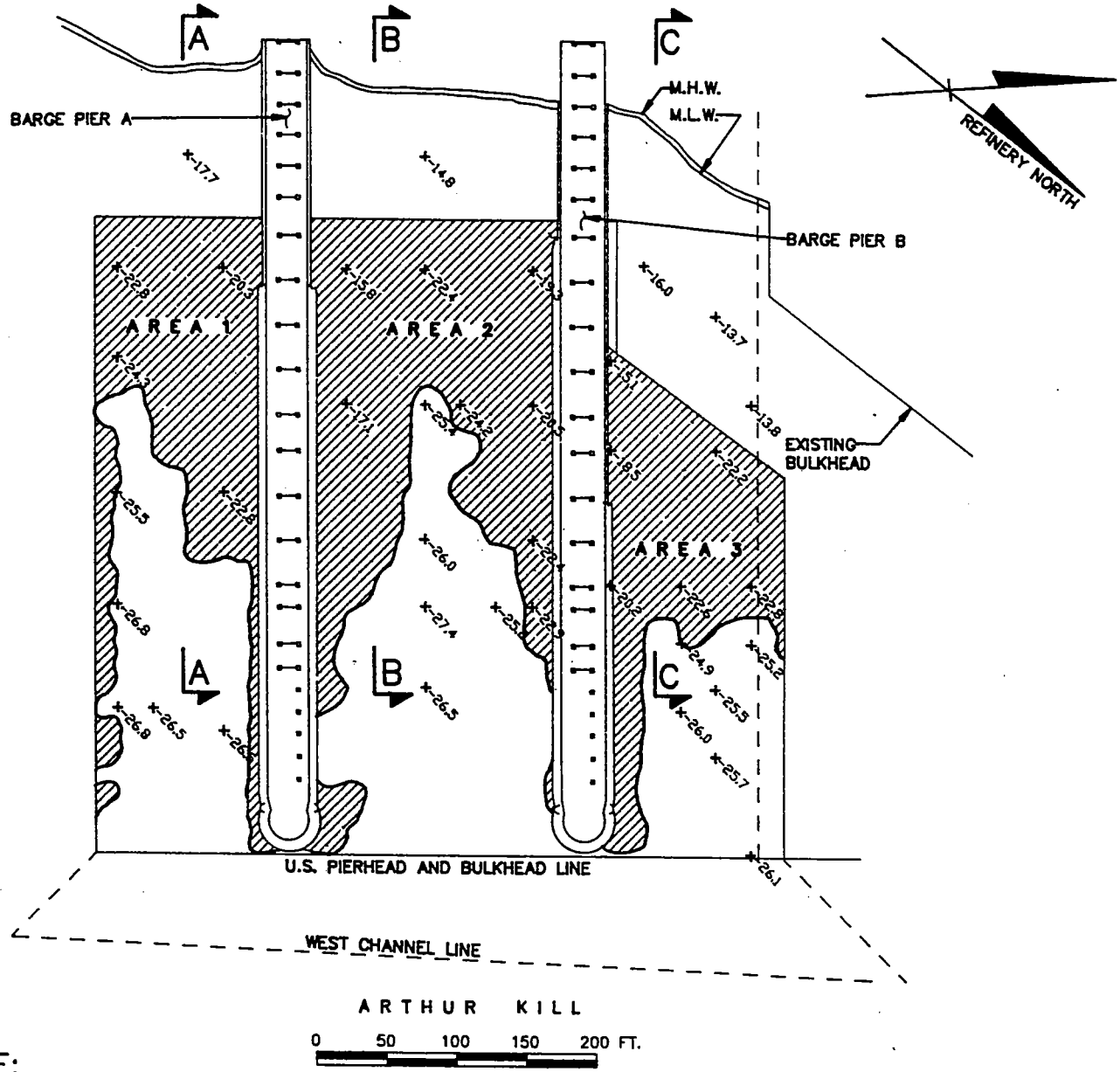
EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY MARINE PROJECTS

IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.

SHEET 2 OF 4 DATE 5/11/92

402-01\FIG\FIG-2C (600)



NOTE:

1. SOUNDINGS TAKEN BY EXXON PERSONNEL USING RAYTHEON FATHOMETER MODEL 719.
2. ALL STATIONS (0+00, 0+25, ETC.) ARE ± 1'–0".
3. SOUNDINGS REFER TO LOCAL MEAN LOW WATER.
4. ELEVATIONS BASED ON BAYWAY REFINERY DATUM, TO CONVERT TO U.S.G.S. SUBTRACT 2.35'.
5. ALL ELEVATIONS ARE (–) MINUS ELEVATIONS.
6. DREDGE TO –25'–0".

DREDGE QUANTITIES – DREDGE TO –25'–0"	
AREA 1	3,095.3 CU. YDS.
AREA 2	5,935.2 CU. YDS.
AREA 3	2,287.6 CU. YDS.
****TOTAL	11,318.1 CU. YDS.

LEGEND: ▨ AREAS TO BE DREDGED

REFERENCE:
M.L.W. =MEAN LOW WATER EL. 0.0'
M.H.W. =MEAN HIGH WATER EL. 4.9'

PURPOSE: BARGE PIERS DREDGING

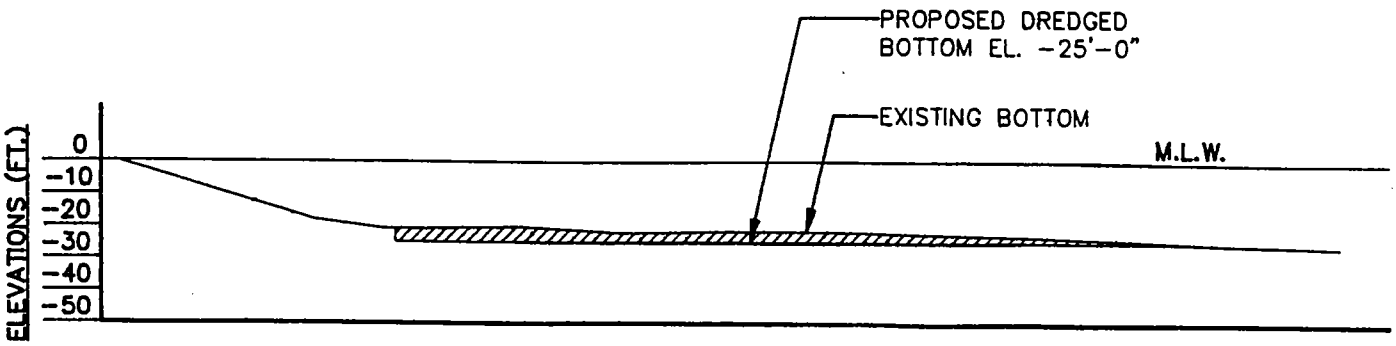
DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:
PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

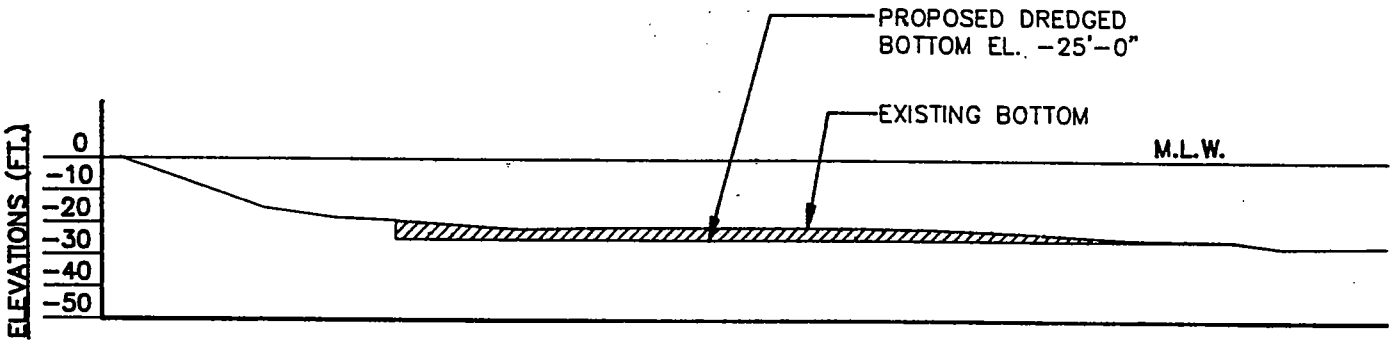
BARGE PIERS A & B SOUNDING GRID AND DREDGING AREA DELINEATION

EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

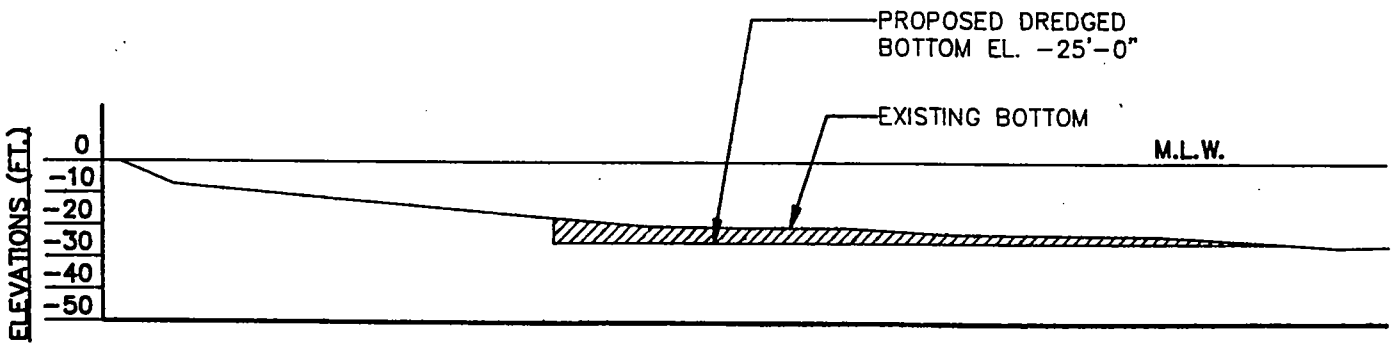
PROPOSED BAYWAY REFINERY MARINE PROJECTS
IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.
SOURCE: EXXON COMPANY, U.S.A.
SHEET 3 OF 4 DATE 3–3–1992



SECTION A–A



SECTION B–B



SECTION C–C

LEGEND: AREAS TO BE DREDGED

0 25 50 75 100 FT.
HORIZONTAL SCALE

REFERENCE:
M.L.W. =MEAN LOW WATER EL. 0.0'
M.H.W. =MEAN HIGH WATER EL. 4.9'

PURPOSE: BARGE PIERS DREDGING

DATUM: MEAN LOW WATER

ADJACENT PROPERTY OWNERS:
1. PUBLIC SERVICE ELECTRIC & GAS
2. JOSEPH CORY WAREHOUSE
3. PHELPS DODGE

BARGE PIERS A & B SECTIONS

EXXON COMPANY, U.S.A.
1400 PARK AVENUE
LINDEN, NJ 07036

PROPOSED BAYWAY REFINERY MARINE PROJECTS
IN: ARTHUR KILL
AT: EXXON BAYWAY REFINERY
COUNTY OF: UNION STATE: NJ
APPLICATION BY: EXXON CO., U.S.A.
PREPARED BY: PAULUS, SOKOLOWSKI & SARTOR, INC.
SOURCE: EXXON COMPANY, U.S.A.
SHEET 4 OF 4 DATE 3-3-1992

HSZ
0184

CENAN-OP-R

MEMORANDUM FOR: Chief, Water Quality Compliance Branch JUN 8 1992

SUBJECT: Application Number 1992-07650-OD: A request for Data Review by the EXXON Company USA, Inc., for Ocean Disposal of Dredged Material from the Arthur Kill, City of Linden, Union County, New Jersey

1. We are requesting the following:

XXXX a. Analysis of the testing which has been submitted as part of the above application. Please indicate the completeness of the testing package and whether the proposed dredged material satisfies the Ocean Dumping Criteria.

____ b. Evaluation of the environmental significance of the mixing zone from the intentional barge overflow at the dredging site. This will be used in an evaluation of the proposed activity in accordance with the guidelines promulgated under Section 404(b)(1) of the Clean Water Act of 1972.

____ c. The presence of a Water Quality Compliance Section representative at a pre-application meeting with

_____

_____

_____.

____ d. A sampling scheme and checklist of required testing for the subject project as further described in the attached information.

____ e. Review of the attached draft public notice for completeness and accuracy.

____ f. Request for re-authorization based upon the attached information.

____ g. Other.

2. It is requested that you respond within **fourteen (14)** working days to allow our expeditious processing of this application.

JOSEPH J. SEEBODE
Chief, Regulatory Branch

Nieves

Attachments

R2T
Tomer

Seebode

The permittee shall allow a authorized Division representative the right to inspect construction pursuant to N.J.A.C. 7:7E-1.5(b)4.

This permit is authorized under and in compliance with Coastal Resource and Development Policies for Port Use 7:7E-7.9.

This permit is issued subject to and provided that the following conditions can be met to the satisfaction of the Division of Coastal Resources. All conditions must be met prior to construction unless otherwise specified. Compliance with Administrative Conditions shall be determined once copies of all specified permits, certifications, plans, agreements, etc. have been received, not less than 30 days prior to construction, and approved by the Division of Coastal Resources. All Physical Conditions are subject to on-site compliance inspection by the Bureau of Enforcement. As per N.J.A.C. 7:7-1.4, you must notify the Bureau of Enforcement, (1510 Hooper Avenue, Toms River, New Jersey 08753), in writing at least 3 days prior to commencement of construction or site preparation.

This permit shall be RECORDED in the office of the County Clerk (the REGISTRAR OF DEEDS AND MORTGAGES in the applicable counties) in the county wherein the lands included in the permit are located within ten (10) days after receipt of the permit by the applicant and verified notice shall be forwarded to the Division of Coastal Resources immediately thereafter.

This permit is NOT VALID until the permit acceptance form has been signed by the applicant, accepting and agreeing to adhere to all permit conditions, and returned to the Division of Coastal Resources at CN 401, Trenton, NJ 08625.

Physical Conditions:

1. During dredging, turbidity must be kept to the lowest levels possible considering the state-of-the-art for controling the movement of suspended material.

2. No barge overflow shall occur during the loading or transportation of spoils.

The plans hereby approved are as follows:

1. Drawing No. June 1989, entitled "Barge Piers A & B, Sounding Grid", Prepared by Exxon Company and dated June 29, 1989.

2. Drawing entitled "Plan, Proposed Dredging", Prepared Paul J. Low-Beer and dated August 13, 1990.

2/14/91
DATE

Ernest F. Hahn
Ernest P. Hahn, Acting Manager
Bureau of Inland Regulation