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: 96-09100-OD
Issue Date: 25 March 1997
Expiration Date: 25 April 1997

To Whom It May Concern:

The New York District, U. S. Army 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), Section 404 of the Clean Water Act (33 U.S.C. 1344), and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended (33 U.S.C. 1413).

APPLICANT: **CITGO Petroleum Corporation**
4801 South Wood Avenue
Linden, New Jersey 07036

ACTIVITY: **Maintenance dredge with barge overflow and subsequent disposal of the dredged material at the Mud Dump Disposal Site off of Sandy Hook, New Jersey**

WATERWAY: **Arthur Kill**

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

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

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

The U.S. Army 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 U.S. Army 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 to collect additional information 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, SHOWN ON THE COVER PAGE, 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 additional information necessary to consider this application. Requests for public hearings shall state, with particularity, the reasons why a public hearing should be held and why the comments can not be submitted by mail. 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. These requests can be mailed to return address on the cover page or FAXED to Mr. Mark Roth at (212) 264-4260.

Our preliminary determination is that the activity for which authorization is sought herein, is not likely to affect any Federally endangered or threatened species or their critical habitat. However pursuant to Section 7 of the Endangered Species Act (16 U.S.C. 1531), the District Engineer is consulting with the appropriate Federal agency to determine the presence or absence of and potential impacts to listed species in the project area 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.

CENAN-OP-RW
APPLICATION NUMBER: 96-09100-OD

Reviews of the activity 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 final 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 proposed 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 final permit decision will be made until one of these actions occur.

For activities within the coastal zone of the State 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

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. Comments or questions may be FAXED to Mr. Mark Roth at (212) 264-4260.

Joseph J. Seebode
Chief, Regulatory Branch

Attachments

CENAN-OP-RW
APPLICATION NUMBER: 96-09100-OD

DESCRIPTION OF WORK

The CITGO Petroleum Corporation proposes to perform maintenance dredging activities at their existing berthing facilities in the Arthur Kill at the City of Linden, Union County, New Jersey. Approximately 34,500 cubic yards of material would be removed from a rectangularly shaped area by clamshell bucket dredge, to a maximum depth of 36 feet below the plane of Mean Low Water (plus two feet of allowable overdepth). Barge overflow is contemplated to maximize the efficiency of dredging and disposal operations. All of the dredged material would be disposed of in the Atlantic Ocean at the Mud Dump Disposal Site (MDDS) off of Sandy Hook, New Jersey.

Any permit issued for the proposed work, would authorize, on an initial basis only, the dredging and disposal as specified in this notice to be completed prior to closure of the MDDS.

The dredged material would be transported by dump scows to the MDDS and deposited using the bottom dumping process.

The MDDS was formally designated by the U.S. Environmental Protection Agency (EPA). The MDDS has an area of 2 square miles and an average depth of 64 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

It is estimated that since 1976 approximately 6.0 million cubic yards of material have been disposed of annually at the MDDS.

As stated in the Ocean Dumping Regulations [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 of the U.S. Army Corps of Engineers has evaluated the practicability of potential disposal alternatives in a 1989 report entitled "Managing Dredged Material: An Evaluation of Disposal Alternatives in the New York - New Jersey Metropolitan Region." 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. They state that there is no vacant land on their property or in the vicinity of the project area upon which the dredged material could be temporarily stored while chemically/physically treating for beneficial reuse, dewatered, or permanently disposed. Therefore, it would become necessary to transport this material by truck in a semi-fluid state to any upland destination. Even if it were physically and economically feasible to dispose of the dredged material, only one upland containment facility (construction of a parking field) is presently in operation requiring physical/chemical modification prior to placement as the parking field's foundation. It has a limited capacity, most of which is dedicated to other dredging projects which failed to satisfy Ocean Dumping Regulations.

The New Jersey Department of Environmental Protection will be contacted by the applicant with a view toward identifying suitable sites that could be used for disposal of dredged material in lieu of ocean disposal.

TESTING

Based upon an analysis of 7 sediment samples submitted by the applicant, the grain size characteristics of the proposed dredged material is as follows: 0% sand, 61.3% silt and 38.1% clay.

Based on the grain size distributions of proposed maintenance dredging material and in accordance with 40 CFR 227 further chemical and biological testing is required to determine the suitability of the sediment for ocean disposal.

Liquid Phase Chemistry: Under the authority of 40 CFR 227, liquid phase chemical analysis was performed for the constituents listed in Table 1 of this public notice. Please note in reading Table 1 that detection limits have been listed for only those constituents which the laboratory reported as non-detected (ND) in the concentration column, which occurred at concentrations below the method detection limit. (This reporting convention was similarly applied in reporting the results of Bioaccumulation Potential testing discussed below).

Expected concentrations of chemical constituents in the water column following disposal, after allowing for initial mixing, were calculated using the Automated Dredging and Disposal Alternatives Management System (ADDAMS), a mixing model developed by the U.S. Army Corps of Engineers Waterways Experimental Station (WES) and described in the implementation manual entitled "Ecological Evaluation of Proposed Discharge of Dredged Material Into Ocean Water" (commonly referred to as the National "Green Book"), published in February 1991 by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency. The model predicted that chemical constituents in the water column following disposal of the dredged material will dilute to concentrations below Federal marine acute water quality criteria within the initial four hour period and will not exceed the boundaries of the disposal site [40 CFR 227.29 (a)].

Bioassay Results (Toxicity): In accordance with 40 CFR 227 of the Ocean Dumping Regulations, bioassays were performed to assess the toxicities of the solid, liquid and suspended particulate phases of the proposed dredged material disposal. Bioassays were performed using appropriate sensitive marine organisms as discussed below. The bioassay testing conformed to procedures outlined in the 1991 National Green Book and the 1992 Regional Testing Manual. The results of bioassay tests conducted on proposed dredged sediments are presented in Table 2 of this public notice.

Solid Phase Bioassay: The **solid phase** is the whole test sediment before it has undergone processing that might alter its chemical or toxicological properties.

For the solid phase bioassay, 10-day toxicity was determined by exposing a filter feeding mysid shrimp *(Mysidopsis bahia)* and a deposit feeding, burrowing amphipod *(Ampelisca abdita)* to composites of sediment from each sampling point and comparing mortalities in those treatments to mortalities experienced after exposure to a reference sediment. The reference sediment represents existing background conditions in the vicinity of the dumpsite, removed from the influence of any disposal operation. Results are evaluated for biologically and statistically significant differences in mortality between treatments. The 1991 National Green Book indicates that dredged material does not meet the whole sediment toxicity criterion when mortality in the test treatments is a) statistically significant and greater than in the reference sediment and (b) exceeds mortality in the reference treatment by at least 10% for mysid shrimp and 20% for amphipod species. The whole sediment toxicity criterion was not exceeded for either organism for the proposed project.

Liquid and Solid Phase Bioassay: The suspended particulate phase also contains the **liquid phase** of the dredged material. The **suspended particulate phase** (SPP) is considered to be the supernatant liquid 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. Disposal site water or clean sea water is substituted where dredging site water is incompatible with test organism survival.

For the liquid and suspended phase bioassay tests, those concentrations of SPP resulting in 50% mortality (LC50s), were determined for the three animal species tested- a crustacean (*M. bahia*), a finfish (*Menidia beryllina*), and the planktonic larvae of a bivalve (*Mytilus edulis*). The median effective concentration (EC50), based on normal larval development to the D-cell stage, was also calculated for *Mytilus edulis*. The limiting permissible concentration (LPC) of SPP is calculated by multiplying the LC50 or EC50 of the most sensitive organism by a safety factor of 100. In other words, 0.01 of the toxic concentration (LC50 or EC50) of the most sensitive organism tested. The LPC was calculated at 0.134 and was obtained from the EC50 of *Mytilus edulis*.

In accordance with the provisions of 40 CFR 227.27 (a)(2), the material can be considered suitable for ocean disposal if the concentration of the SPP of the dredged material, after allowance for initial mixing, will not exceed the LPC beyond the boundaries of the disposal site within the first four hours following dumping or at any point in the marine environment after the first four hours.

Initial mixing evaluations were conducted using the ADDAMS mixing model. Results of the analysis indicate that the LPC will be met for the proposed dredged material.

Bioaccumulation Potential: An estimate of bioaccumulation potential was made by analyzing the concentrations of contaminants in tissue of organisms surviving 28-day exposure to composited sediments and comparing them to tissue levels of organisms exposed to reference sediment (a reference sediment represents existing background conditions in the vicinity of the dumpsite, removed from the influence of any disposal operation). Results are evaluated for biologically and statistically significant differences in mortality between treatments. Bioaccumulation potential was analyzed in two organisms, a burrowing, deposit-feeding polychaete [a worm (*Nereis virens*)] and a filter-feeding bivalve [a clam (*Macoma nasuta*)].

Based on the requirements of 40 CFR 227.6 and 227.27, bioaccumulation analyses was performed for the chemical constituents listed in Table 3 of this public notice. All constituents identified in worm and clam tissue were compared to existing Food and Drug Administration (FDA) action levels for poisonous or deleterious substances in fish and shellfish for human food, regional disposal criteria, background concentrations and risk-based criteria.

Total DDT steady state concentrations were above regional disposal criteria for unrestricted ocean disposal. Dredged material that results in such tissue concentrations is subsequently capped.

Concentrations of dioxin above the regional Category I Criteria values [1 pptr (parts per trillion) for 2,3,7,8-TCDD and 4.5 pptr for the non 2,3,7,8-TCDD congeners], but less than regional Category III Criteria value, were measured in the tissues of organisms exposed to proposed dredged material. As per New York/New Jersey Harbor Regional Ocean Disposal Criteria for dredged material containing dioxin, dredged material that results in such tissue concentrations is capped. In this case, possible sources of capping material are the Sandy Hook Federal Channel and the Ambrose Federal Channel.

Based on the results of the testing performed, the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency have determined that the proposed maintenance material is considered Category II dredged material and is suitable for ocean disposal with subsequent capping. The material contains none of the constituents prohibited in 40 CFR 227.6 as other than trace contaminants, and meets the LPC requirements of 40 CFR 227.27.

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE

	SITE WATER		ELUTRIATE	
CONSTITUENTS	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)
Ag		1.143		1.133
Cd	1.000	ND	1.000	ND
Cr	6.000	ND	6.000	ND
Cu	6.000	ND	6.000	ND
Hg		0.103		0.113
Ni	8.000	ND	15.000	ND
Pb		14.433	5.000	ND
Zn		13.633		246.667
Pesticides	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)
Aldrin		0.001	0.001	ND
a-Chlordane		0.001		0.002
trans Nonachlor	0.002	ND	0.002	ND
Dieldrin	0.001	ND	0.001	ND
4,4'-DDT		0.002		0.001
2,4'-DDT	0.001	ND	0.001	ND
4,4'-DDD		0.002		0.002
2,4'-DDD		0.002		0.002
4,4'-DDE	0.003	ND	0.003	ND
2,4'-DDE		0.001	0.001	ND
Total DDT		**0.009**		**0.007**
Endosulfan I	0.001	ND	0.001	ND
Endosulfan II		0.002	0.001	ND
Endosulfan sulfate	0.002	ND	0.002	ND
Heptachlor		0.001		0.013
Heptachlor epoxide		0.002		0.002
Industrial Chemicals	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)
PCB 8	0.004	ND	0.004	ND
PCB 18	0.002	ND	0.002	ND
PCB 28	0.002	ND	0.002	ND
PCB 44	0.002	ND	0.002	ND
PCB 49	0.003	ND	0.003	ND
PCB 52	0.002	ND	0.002	ND
PCB 66	0.002	ND	0.002	ND
PCB 87	0.003	ND	0.003	ND
PCB 101	0.002	ND	0.002	ND
PCB 105	0.002	ND	0.002	ND
PCB 118	0.003	ND	0.003	ND
PCB 128	0.003	ND	0.003	ND
PCB 138	0.002	ND	0.002	ND
PCB 153	0.001	ND	0.001	ND
PCB 170	0.002	ND	0.002	ND
PCB 180	0.001	ND	0.001	ND
PCB 183	0.002	ND	0.002	ND
PCB 184	0.001	ND	0.001	ND
PCB 187	0.001	ND	0.001	ND
PCB 195	0.003	ND	0.003	ND
PCB 206	0.003	ND	0.003	ND
PCB 209	0.003	ND	0.003	ND
Total PCB		**0.095**		**0.095**

ND = Not detected

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT

Total PCB = sum of congeners reported x 2

Concentrations shown are the mean of three replicate analyses

Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit

Citgo - Linden

TABLE 2. TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC50/EC50		LPC (a)
Menidia beryllina	96 hours	(b)	19.9%	0.199
Mysidposis bahia	96 hours	(b)	17.8%	0.178
Mytilus edulis (larval survival)	48 hours	(b)	17.9%	0.179
Mytilus edulis (larval normal develop.)	48 hours	(c)	13.4%	0.134

(a) Limiting Permissible Concentration (LPC) is the LC 50 or EC 50 times 0.01.
(b) Median Lethal Concentration (LC50) resulting in 50% mortality at test termination.
(c) Median Effective Concentration (EC50) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival in Test	% Difference Reference -Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	99.00%	92.00%	7.00%	NO
Mysidposis bahia	91.00%	89.00%	2.00%	NO

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
Wet weight concentrations

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCEN TRATIO	DETECTION LIMITS	CONCEN TRATIO	DETECTION LIMITS	CONCEN TRATIO	DETECTION LIMITS	CONCEN TRATIO
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.081		0.110		0.021		0.026
As		4.056		4.430		2.872		2.340
Cd		0.044		0.059		0.042		0.054
Cr		0.371		0.989		0.171		0.319
Cu		17.480		18.360		1.034		1.822
Hg		0.046		0.074		0.012		0.016
Ni		1.204		1.414		0.136		0.259
Pb		0.654		1.819		0.249		0.533
Zn		24.480		26.380		15.440		17.360
Pesticides	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)
Aldrin		0.049		0.068		0.016	0.014	ND
a-Chlordane		0.097		0.766		0.170		1.383
trans Nonachlor		0.129		0.369		0.358		1.037
Dieldrin		1.165		1.013		0.342		1.119
4,4'-DDT		0.088		3.835		0.028		2.156
2,4'-DDT		0.069		0.218		0.062		0.215
4,4'-DDD		0.642		14.906		0.437		14.643
2,4'-DDD		0.061		9.684		0.127		15.237
4,4'-DDE		8.156		11.054		0.082		7.349
2,4'-DDE		0.131		1.150	0.147	ND	0.146	ND
Total DDT		9.146		40.848		0.809		39.673
Endosulfan I	0.089	ND		1.308	0.077	ND		0.268
Endosulfan II	0.059	ND		0.116		0.053	0.099	ND
Endosulfan sulfate		0.191		0.339		0.253		0.291
Heptachlor	0.166	ND	0.207	ND	0.029	ND	0.029	ND
Heptachlor epoxide		0.028	0.169	ND		0.068		0.077
Industrial Chemicals	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)
PCB 8		0.499		0.300		0.251		0.264
PCB 18	0.065	ND		0.471	0.137	ND		1.085
PCB 28		0.074		2.005		0.082		1.998
PCB 44		0.425		1.437		0.177		1.564
PCB 49		0.058		1.855		0.073		1.776
PCB 52		0.116		2.649		0.154		3.489
PCB 66		0.161		2.500		0.097		2.063
PCB 87		0.045		0.659		0.031		0.427
PCB 101		0.236		2.105		0.434		2.665
PCB 105	0.022	ND		0.569		0.191		0.967
PCB 118		0.112		1.504		0.333		2.238
PCB 128		0.028		0.183		0.084		0.289
PCB 138		0.133		1.318		1.227		3.122
PCB 153		0.174		2.171		1.802		3.996
PCB 170		0.179		1.087		0.385		0.940
PCB 180		0.045		0.607		0.807		1.918
PCB 183		0.009		0.151		0.252		0.511
PCB 184	0.098	ND	0.122	ND	0.092	ND		0.095
PCB 187		0.027		0.381		0.613		1.164
PCB 195		0.034		0.080		0.123		0.237
PCB 206		0.043		0.123		0.182		0.328
PCB 209		0.029		0.139		0.205		0.263
Total PCB		5.042		44.710		15.235		62.795
1,4-Dichlorobenzene		4.176		5.491		1.540		2.183

CITGO - LINDEN

TABLE 3. (Continued)

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)
Naphthalene		0.631		* 2.040		1.672		1.935
Acenaphthalene	0.621	nd		* 1.071		0.178		* 0.375
Acenaphthene	0.959	nd		* 0.692		0.477		0.672
Flourene	1.049	nd		* 1.070		0.433		0.405
Phenanthrene		0.473		* 7.306		0.303		* 1.248
Anthracene		0.227		* 4.299		0.420		0.582
Fluoranthene		0.788		* 28.835		0.388		* 8.290
Pyrene		0.503		* 40.486		0.269		* 12.598
Benzo(a)anthracene		0.322		* 16.460		0.445		* 1.523
Chrysene		0.566		* 28.627		0.233		* 8.335
Benzo(b)fluoranthene		0.493		* 23.060		0.129		* 2.880
Benzo(k)fluoranthene		0.151		* 5.476		0.365		* 0.925
Benzo(a)pyrene		0.265		* 12.807		0.296		* 1.416
Indeno(1,2,3-cd)pyrene		0.143		* 4.996		0.529		0.693
Dibenzo(a,h)anthracene		0.356		* 1.703		0.428		0.265
Benzo(g,h,i)perylene		0.174		* 7.947		0.205		* 1.330
Total PAH's		6.407		* 186.875		6.770		* 43.472
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD	0.460	ND		* 0.792		0.252		* 1.200
12378 PeCDD	0.700	ND	1.120	ND		0.116		0.200
123478 HxCDD	0.640	ND	1.160	* ND	0.280	ND		0.142
123678 HxCDD	0.620	ND	1.000	ND		0.226		* 0.440
123789 HxCDD	0.560	ND	1.000	* ND		0.188		* 0.256
1234678 HpCDD	0.820	ND		* 4.260		1.560		2.620
1234789 OCDD		2.010		* 43.500		11.100		22.000
2378 TCDF	0.420	ND		* 1.108		1.480		* 2.620
12378 PeCDF	0.420	ND		* 0.458		0.155		* 0.714
23478 PeCDF	0.420	ND		0.366		0.288		* 0.952
123478 HxCDF	0.460	ND		* 0.840		0.346		* 1.062
123678 HxCDF	0.380	ND		* 0.338		0.108		* 0.312
234678 HxCDF		0.426		* 0.656		0.590		* 0.702
123789 HxCDF	0.500	ND	0.900	* ND	0.220	ND	0.156	ND
1234678 HpCDF		0.274		* 2.200		0.620		* 1.490
1234789 HpCDF	0.660	ND	1.180	* ND	0.300	ND		0.134
12346789 OCDF	1.080	ND		* 5.380		0.630		* 1.822

ND = Not detected

Total PAH = Sum of all PAH's.

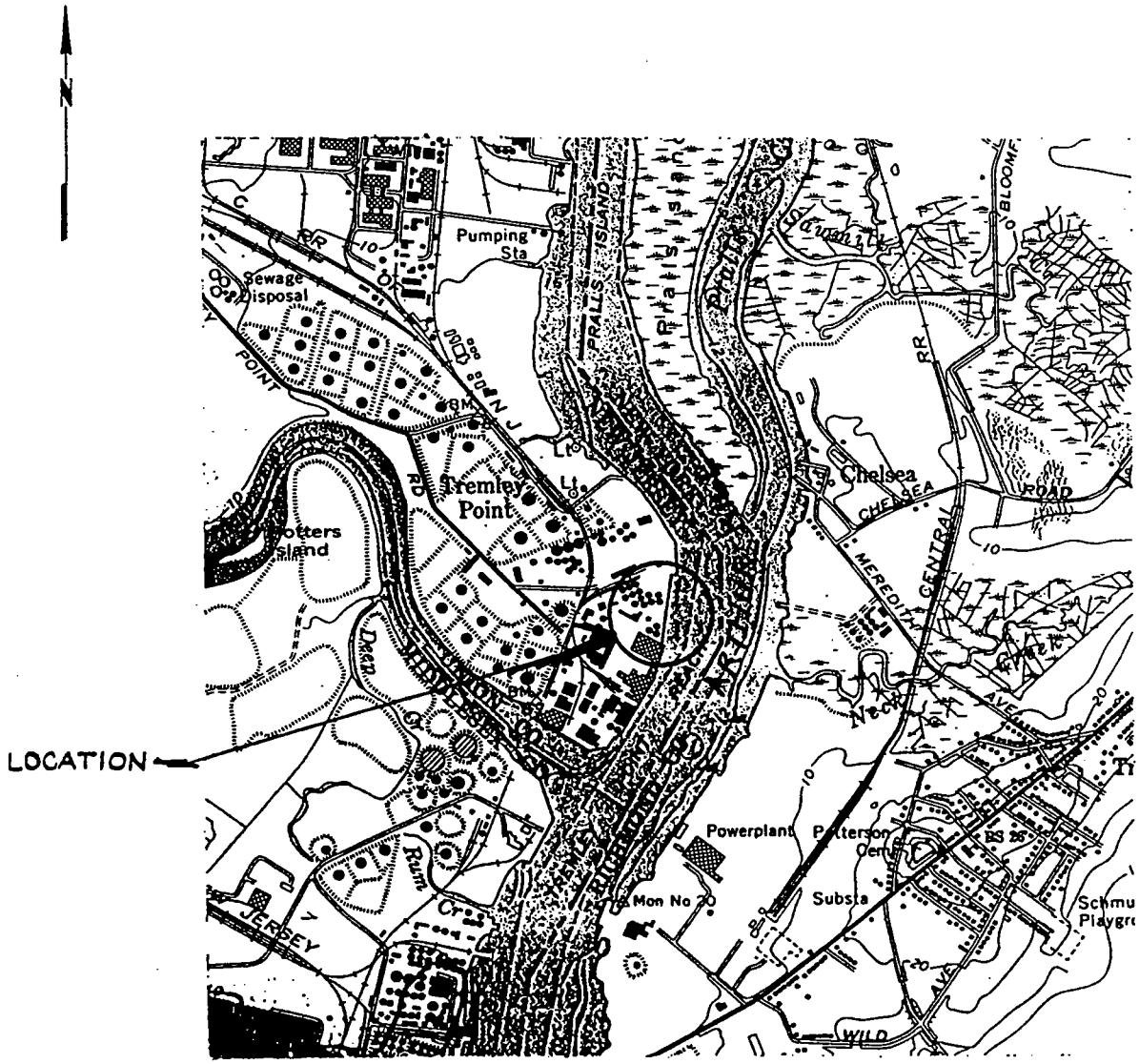
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT

Total PCB = 2(x), where x = sum of PCB congeners

Concentrations shown are the mean of 5 replicate analyses in wet weight.

For values reported as ND (not detected), one-half of the detection limit is used in the calculation of the mean concentration

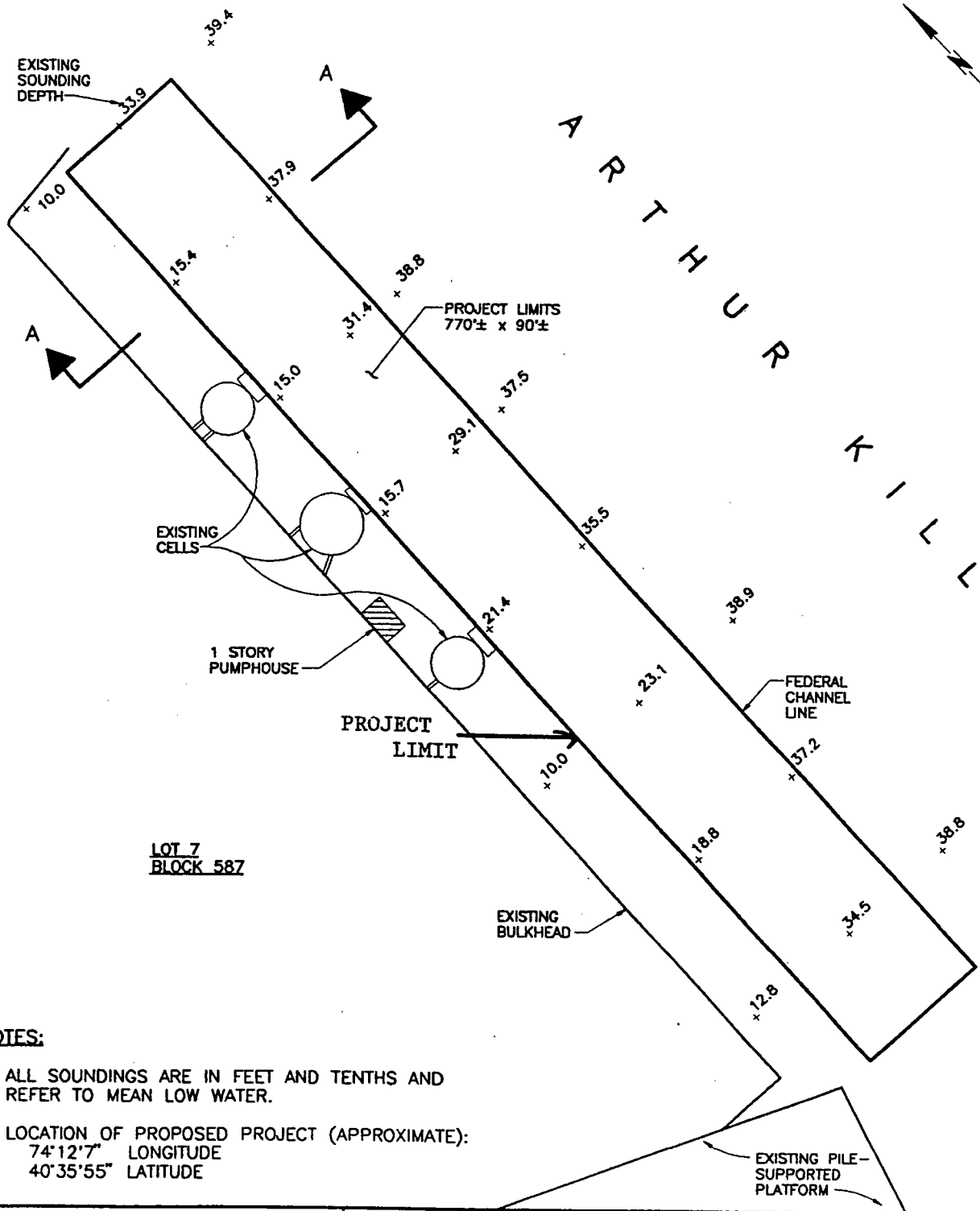
* = Statistically significant at the 95% conficence level



APPROXIMATE LOCATION: 74°12'7" LONGITUDE, 40°35'55" LATITUDE

FROM: UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
ARTHUR KILL, N.Y.–N.J., QUADRANGLE

PURPOSE: DREDGING DATUM: MLW ADJACENT PROPERTY OWNERS: 1. AMERICAN CYANAMID CO. 2. B.P. OIL CO.	**V I C I N I T Y M A P** GRAPHIC SCALE 1000' 0 1000' 2000' CITGO PETROLEUM CORP. 4801 SOUTH WOOD AVENUE LINDEN, NEW JERSEY 07036	PROPOSED DREDGING IN: ARTHUR KILL AT: TREMLEY POINT COUNTY OF: UNION, N.J. APPLICATION BY: CITGO PETROLEUM SHT. 1 OF 4 DATE: 3-12-97



NOTES:

1. ALL SOUNDINGS ARE IN FEET AND TENTHS AND REFER TO MEAN LOW WATER.
2. LOCATION OF PROPOSED PROJECT (APPROXIMATE):
   74°12'7" LONGITUDE
   40°35'55" LATITUDE

PURPOSE: DREDGING

DATUM: MLW

ADJACENT PROPERTY OWNERS:
1. AMERICAN CYANAMID CO.
2. B.P. OIL CO.

PLAN VIEW

GRAPHIC SCALE

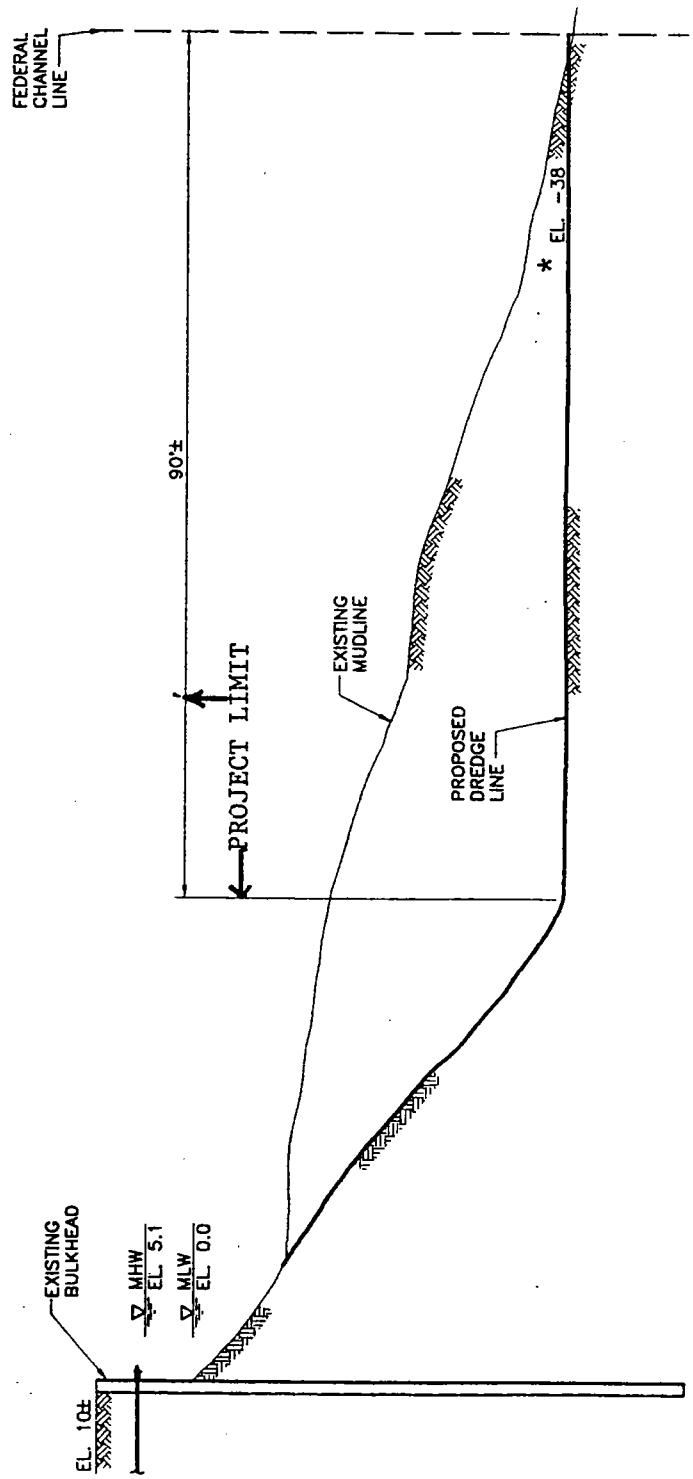
100' 50' 0 100'

CITGO PETROLEUM CORP.
4801 SOUTH WOOD AVENUE
LINDEN, NEW JERSEY 07036

PROPOSED DREDGING

IN: ARTHUR KILL
AT: TREMLEY POINT
COUNTY OF: UNION, N.J.
APPLICATION BY: CITGO PETROLEUM

SHT. 2 OF 4 DATE: 3-12-97



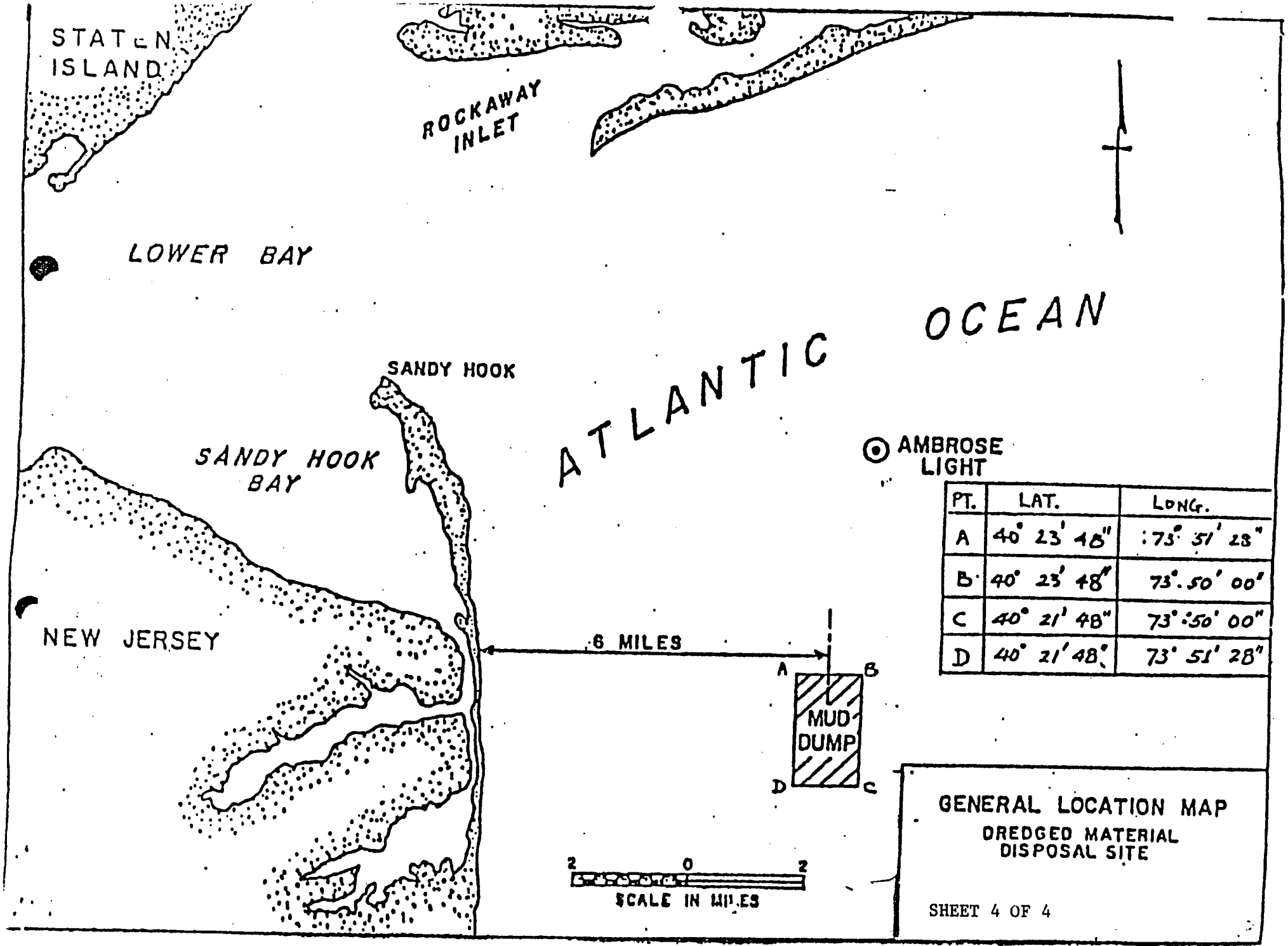
SECTION A-A

NOTES:

1. ELEVATIONS REFER TO MEAN LOW WATER. MEAN LOW WATER AT THE SITE IS CURRENTLY ESTABLISHED AS 2.1 FEET BELOW MEAN SEA LEVEL DATUM.
2. THE MEAN TIDAL RANGE IS 5.1 FEET.

* THIS ELEVATION REPRESENTS PROJECT DEPTH PLUS TWO FEET OF OVERDEPTH

PURPOSE: DREDGING DATUM: MLW ADJACENT PROPERTY OWNERS: 1. AMERICAN CYANAMID CO. 2. B.P. OIL CO.	**SECTION VIEW** GRAPHIC SCALE 20' 10' 0 20' CITGO PETROLEUM CORP. 4801 SOUTH WOOD AVENUE LINDEN, NEW JERSEY 07036	PROPOSED DREDGING IN: ARTHUR KILL AT: TREMLEY POINT COUNTY OF: UNION, N.J. APPLICATION BY: CITGO PETROLEUM SHT. 3 OF 4 DATE: 3-12-97



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 4 OF 4