COPY

DEPLOYMENT OF DREDGED MATERIAL DISPOSAL BUOYS AT THE CENTRAL LONG ISLAND SOUND AND WESTERN LONG ISLAND SOUND DISPOSAL SITES

CONTRIBUTION #16

SCIENCE APPLICATIONS, INC.

DEPLOYMENT OF DREDGED MATERIAL DISPOSAL BUOYS AT THE CENTRAL LONG ISLAND SOUND AND WESTERN LONG ISLAND SOUND DISPOSAL SITES

CONTRIBUTION #16

MARCH 22, 1982

CONTRACT #DACW33-82-D-0002

Submitted to:
U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02154

Submitted by:
Robert W. Morton
Science Applications, Inc.
Ocean Science & Technology Division
202 Thames Street
Newport, Rhode Island 02840

1.0 INTRODUCTION

Point dumping of dredged material at specified disposal points has recently become a standard management procedure for disposal of dredged harbor sediment in Long Island Sound. In order to accomplish this procedure, marker buoys with an extremely small watch circle are required to reduce the effective spreading of material on the bottom. The dredging of the Mill and Quinnipiac Rivers in New Haven and several harbors in Western Long Island Sound has created a need for two such buoys, one at the Central Long Island Sound Disposal Site and one at the recently designated Western Long Island Sound Disposal Site. These buoys were deployed as part of the Disposal Area Monitoring System (DAMOS) on March 19, 1982.

2.0 LOCATION

The designated points for deployment of the disposal buoys were selected based on management criteria developed at the New England Division to be compatible with past and future projects and to insure minimal environmental impact from the disposal operations.

At the Central Long Island Sound Disposal Site (Fig. 2.0-1) the buoy was located in the southwest corner of the area in order to reduce interference with ongoing monitoring of the Stamford-New Haven and Norwalk projects as well as future measurements that may be conducted jointly with the Narragansett Research Laboratory of EPA in the northeast portion of the site. The coordinates of the point designated for disposal of Mill and

CLIS

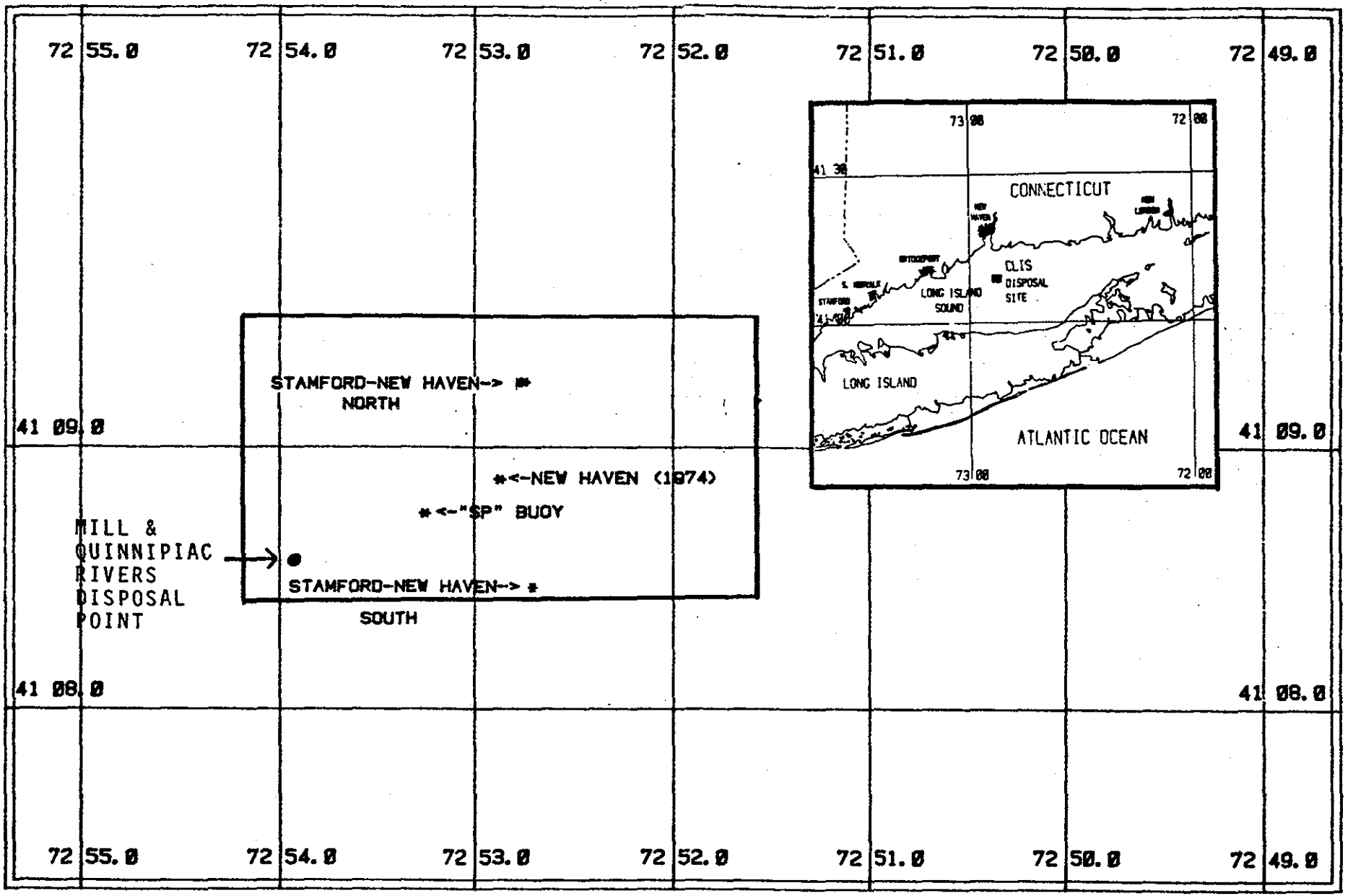


Figure 2.0-1

Quinnipiac River sediments were:

41°08.6'N

72°53.9'W

The point designated for disposal in the Western Long Island Sound Site (Fig. 2.0-2) was based on results of a baseline survey of the entire WLIS site conducted in January 1982. During that survey, a topographic depression in the southwest corner of the area was found to be suitable for disposal, and a baseline bathymetric survey of an 800 square meter area was conducted. Based on the results of that survey, the coordinates for the disposal buoy were specified as:

40°59.34'N

73°29.21'W

3.0 MOORING DESIGN

Previous disposal buoys have been installed with an elastic tether mooring design which has been successful in maintaining the desired small watch circle. However, the requirement for frequent relocation of the disposal point has prompted development of a different design since it was usually impossible to move the tethered mooring once disposal had occurred.

The design used on these moorings makes use of a suspended weight and nylon line to provide shock absorbing capabilities while maintaining the desired tension to produce a small watch circle radius. Calculations of tension and drag coefficients using SAI mooring design software indicate that horizontal displacements of the surface buoy will be less than

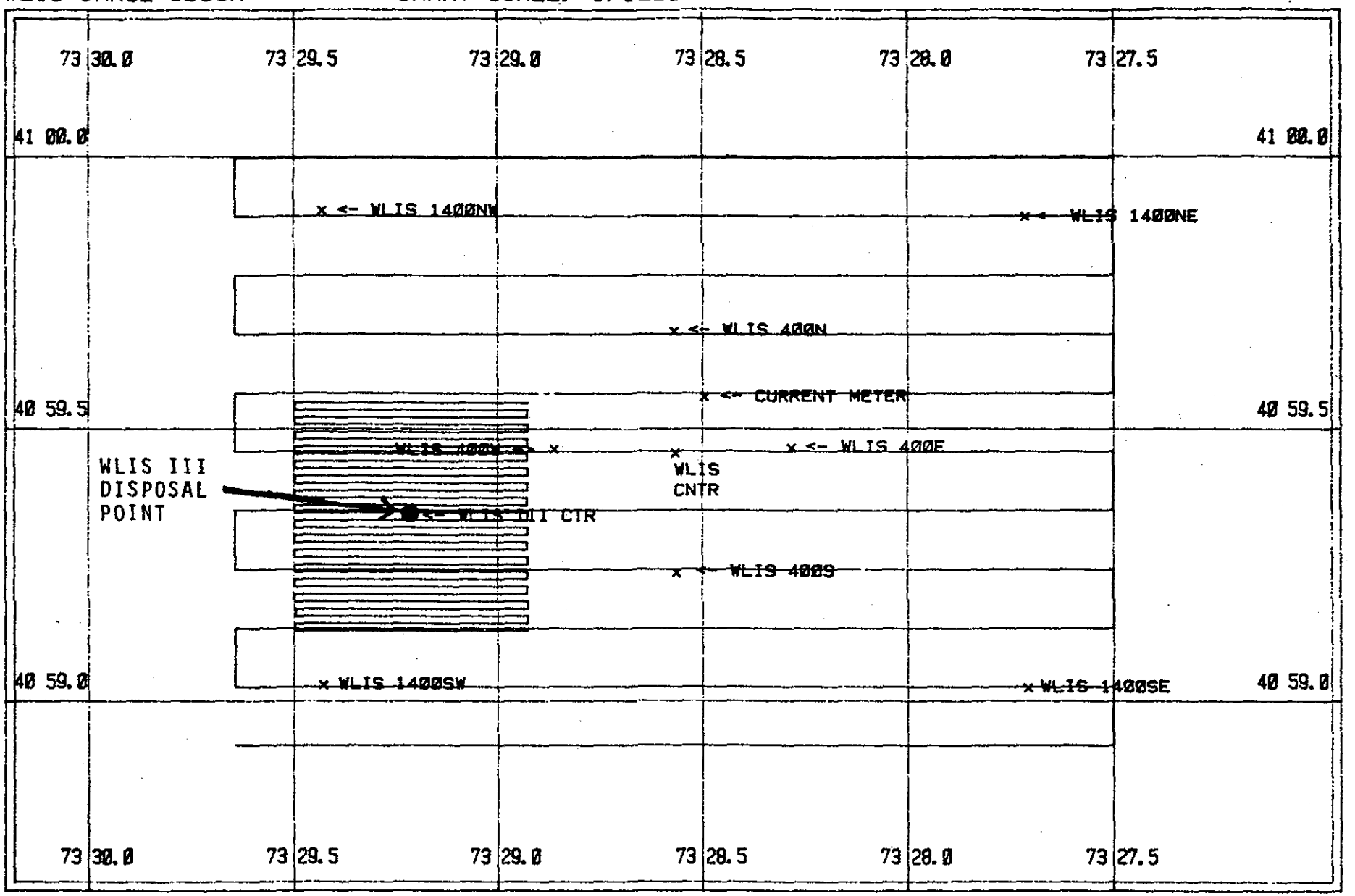

WLIS JAN82 SDSCN
CHART SCALE: 1/12000
73 30.0
73 29.5
73 29.0
73 28.5
73 28.0
73 27.5
41 00.0
40 59.5
40 59.0
x <- WLIS 1400NW
x <- WLIS 1400NE
x <- WLIS 400N
x <- CURRENT METER
x <- WLIS 400E
WLIS III
DISPOSAL
POINT
WLIS
CNTR
x <- WLIS 400S
x WLIS 1400SW
x WLIS 1400SE

Figure 2.0-2

five meters with the worst case occurring at slack low water. A schematic diagram of each mooring, indicating the significant components is presented in Figure 3.0-1 a and b.

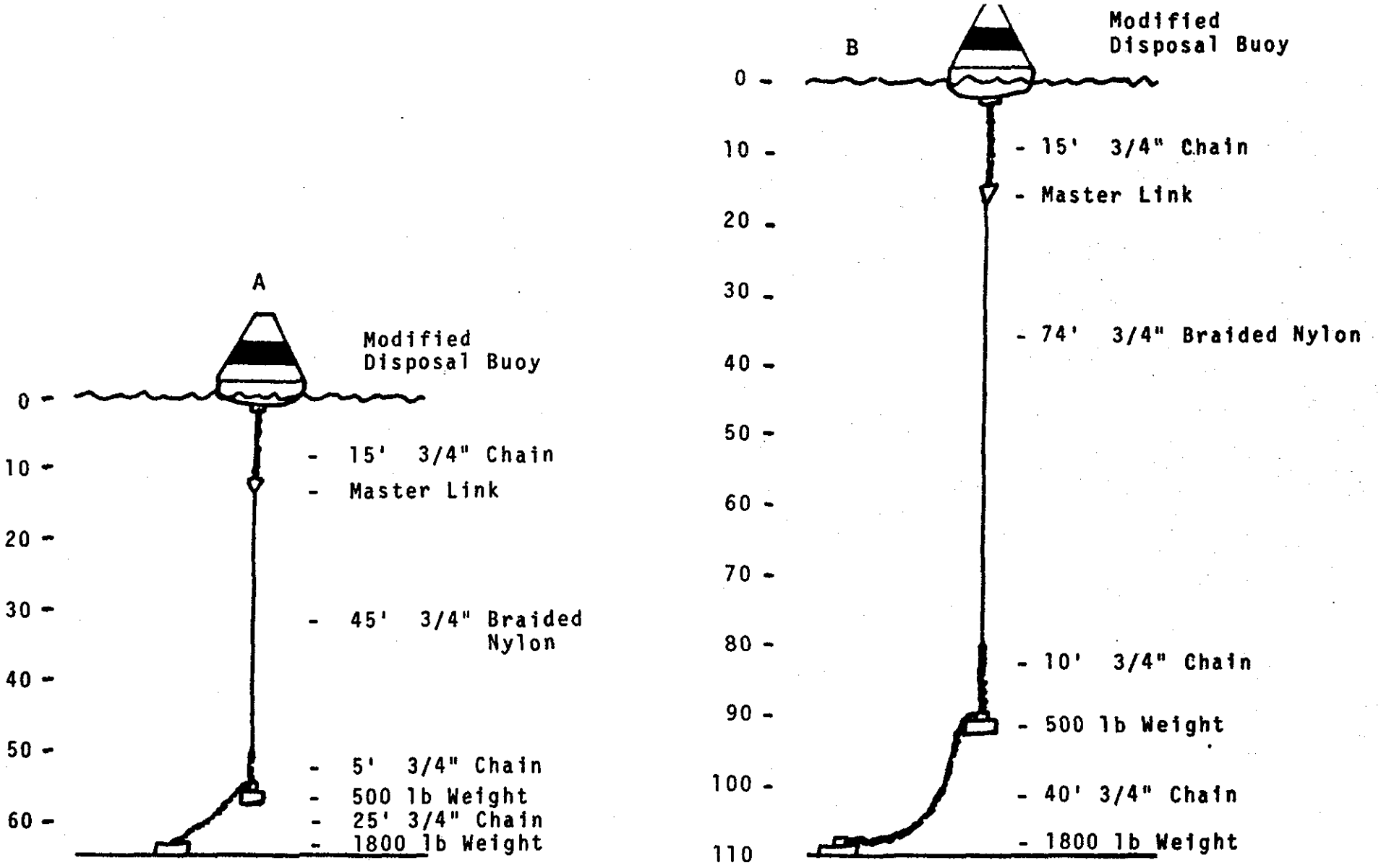
In order to facillitate relocation of the buoy, a master link was included just above the nylon line. This master link will permit a diver to easily shackle a lifting cable into the mooring which could then be used to lift the anchor weight through the accumulated dredged material. Once free of the sediment, it can be dragged to a new location without the necessity for redeploying the entire mooring. Using this technique, the mooring could be easily moved several times as long as the depth in the site does not vary by more than a few meters.

In addition to changes in the mooring design, several modifications have been made to the marker buoy as well. Most significant of these is a change to a more powerful light. A Tideland Model ML-155 flashing 4 second light was installed inside the superstructure of the buoy with sufficient battery power stored in the base of the buoy to last for one year. Since these lights are relatively expensive, the superstructure was reinforced and engineered so that any wires or lines that struck the buoy would ride over the assembly without damage.

Increased visibility and radar reflectivity were attained through addition of four aluminum radar reflectors to the superstructure. Finally, reflective tape was applied to various parts of the buoy to increase the nighttime visibility of the marker.

4.0 DEPLOYMENT

Both buoys were deployed from the R/V UCONN on 19 March



CENTRAL LONG ISLAND SOUND
DISPOSAL SITE

WESTERN LONG ISLAND SOUND
DISPOSAL SITE

MOORING DESIGN SCHEMATICS

LONG ISLAND SOUND DISPOSAL BUOYS

FIG. 3.0-1

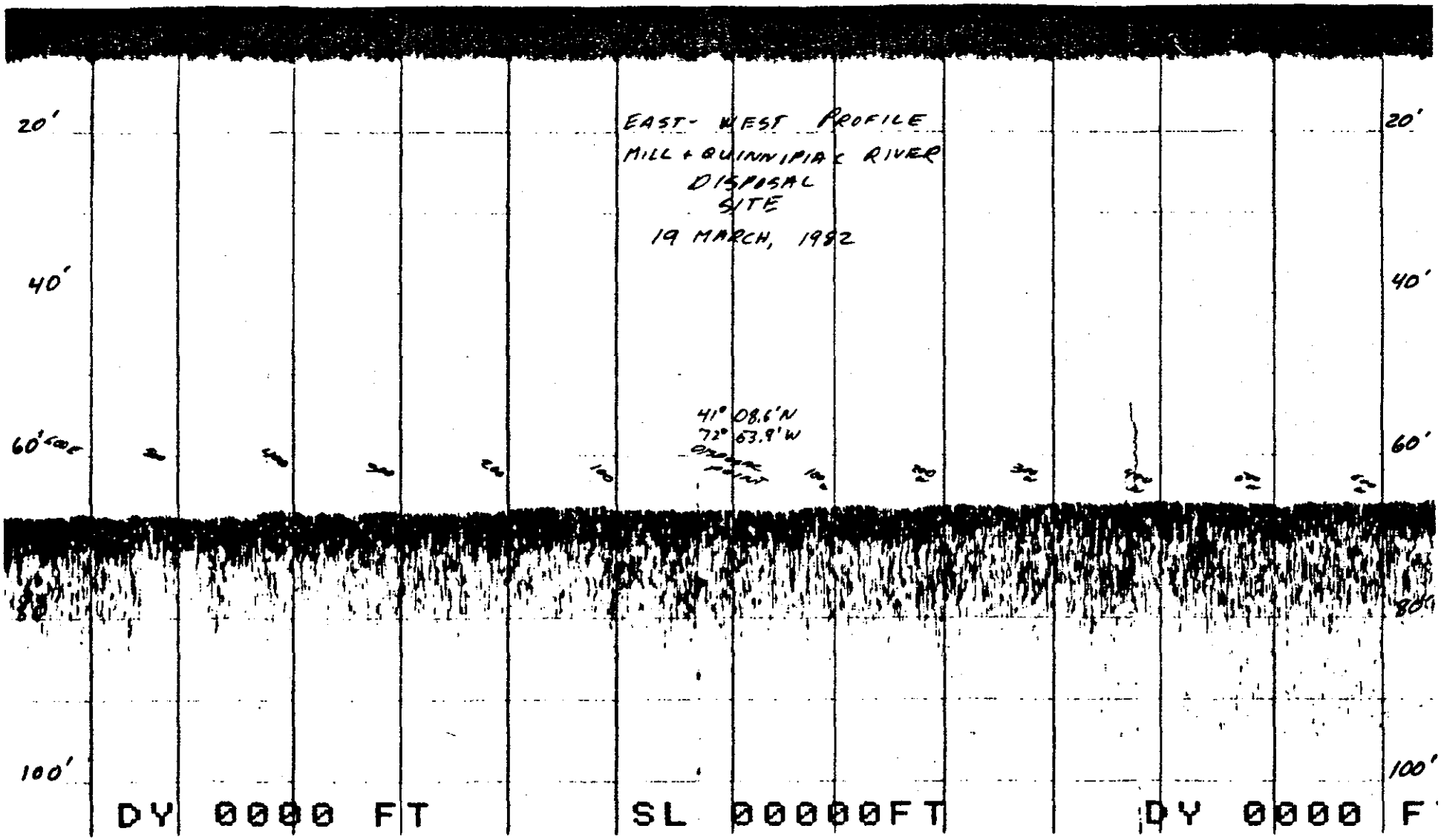
1982. Navigation control was provided by the SAI Navigation and Data Acquisition System with the trisponder shore stations located at the standard DAMOS positions.

Since a detailed baseline survey of the Mill and Quinnipiac River Site had not yet been completed, a depth profile was made from 600 m east to 600 m west of the proposed disposal point (Fig. 4.0-1). As expected, the bottom was extremely flat, at a depth of approximately 20 meters (66 feet, uncorrected).

After checking the depth, the buoy was deployed at the designated point of 40°08.6'N, 72°53.8'W (Fig. 4.0-2). Following deployment, the position was verified by bringing the ship alongside. Measured Trisponder ranges for the buoy were 17280 m from Stratford Point, and 11740 m from Lighthouse Point. Loran-C time delays were measured on the 9960 chain from the X and Y slaves as 26552.4 and 43997.1 μsec respectively. From this position the "SP" buoy marking the permit dumping location bears 095°M at 800 meters.

The WLIS III buoy was deployed in a similar manner, however, since a baseline survey had recently been completed no depth profile was made. A check of the depth as approximately 34 meters (112', uncorrected) was sufficient to verify buoy design criteria. The marker was deployed at the designated point of 40°59.34'N, 73°29.21'W (Fig. 4.0-3) and position checks similar to those at the CLIS site were made.

The Trisponder ranges were 11236 meters from the power station dock in Norwalk, Connecticut and 8572 meters from the Eaton's Neck Lighthouse. Loran-C readings were again taken from the X and Y slaves as 26830.6 and 43975.0 μsec.



DEPTH PROFILE ACROSS DESIGNATED DISPOSAL POINT

MILL AND QUINNIPIAC RIVERS

Figure 4.0-1

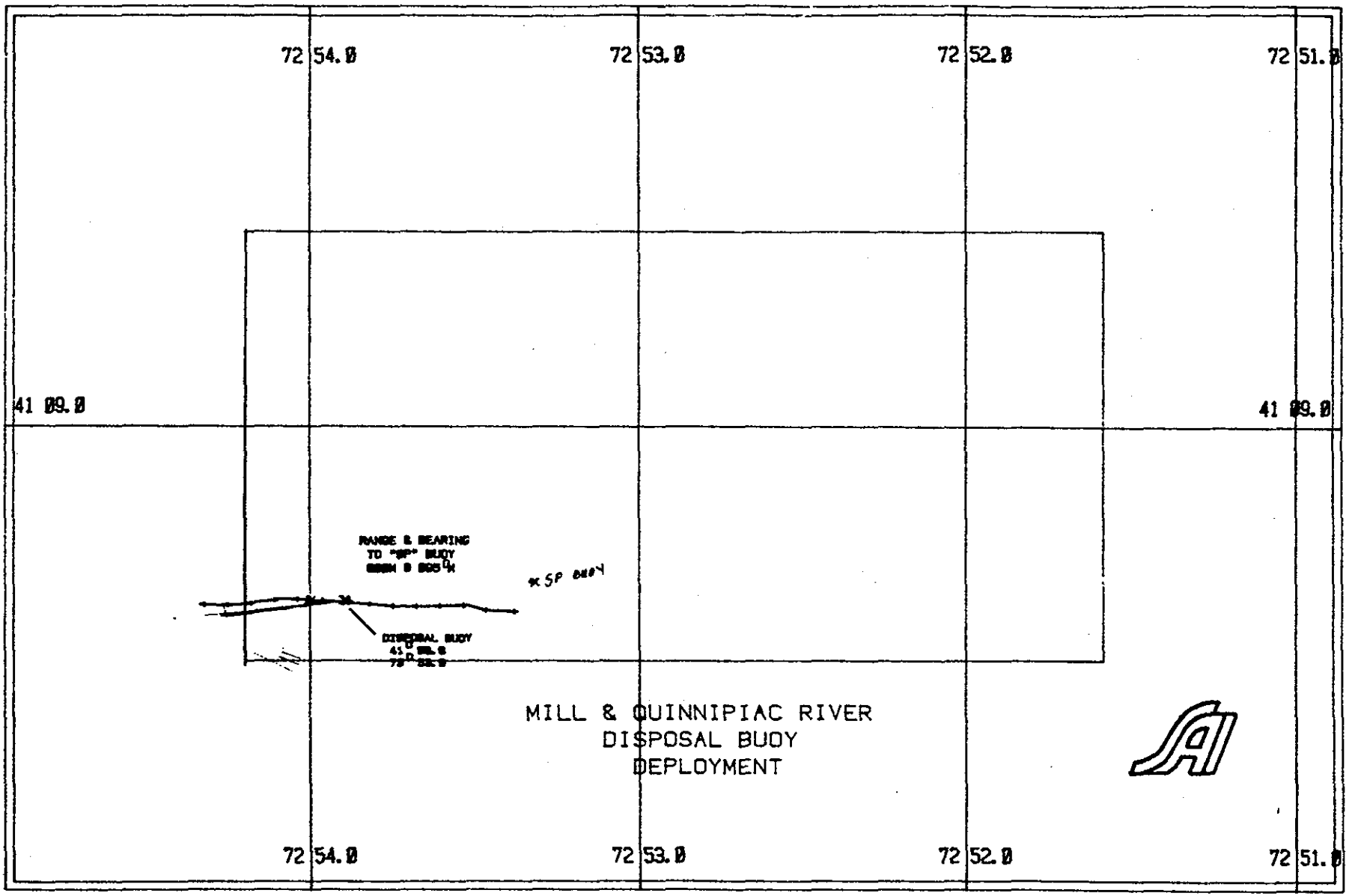

CLIS MASTER
CHART SCALE: 1/15000
72 54.0
72 53.0
72 52.0
72 51.0
41 09.0
41 09.0
RANGE & BEARING
TO "SP" BUOY
DISPOSAL BUOY
MILL & QUINNIPIAC RIVER
DISPOSAL BUOY
DEPLOYMENT
72 54.0
72 53.0
72 52.0
72 51.0

Figure 4.0-2

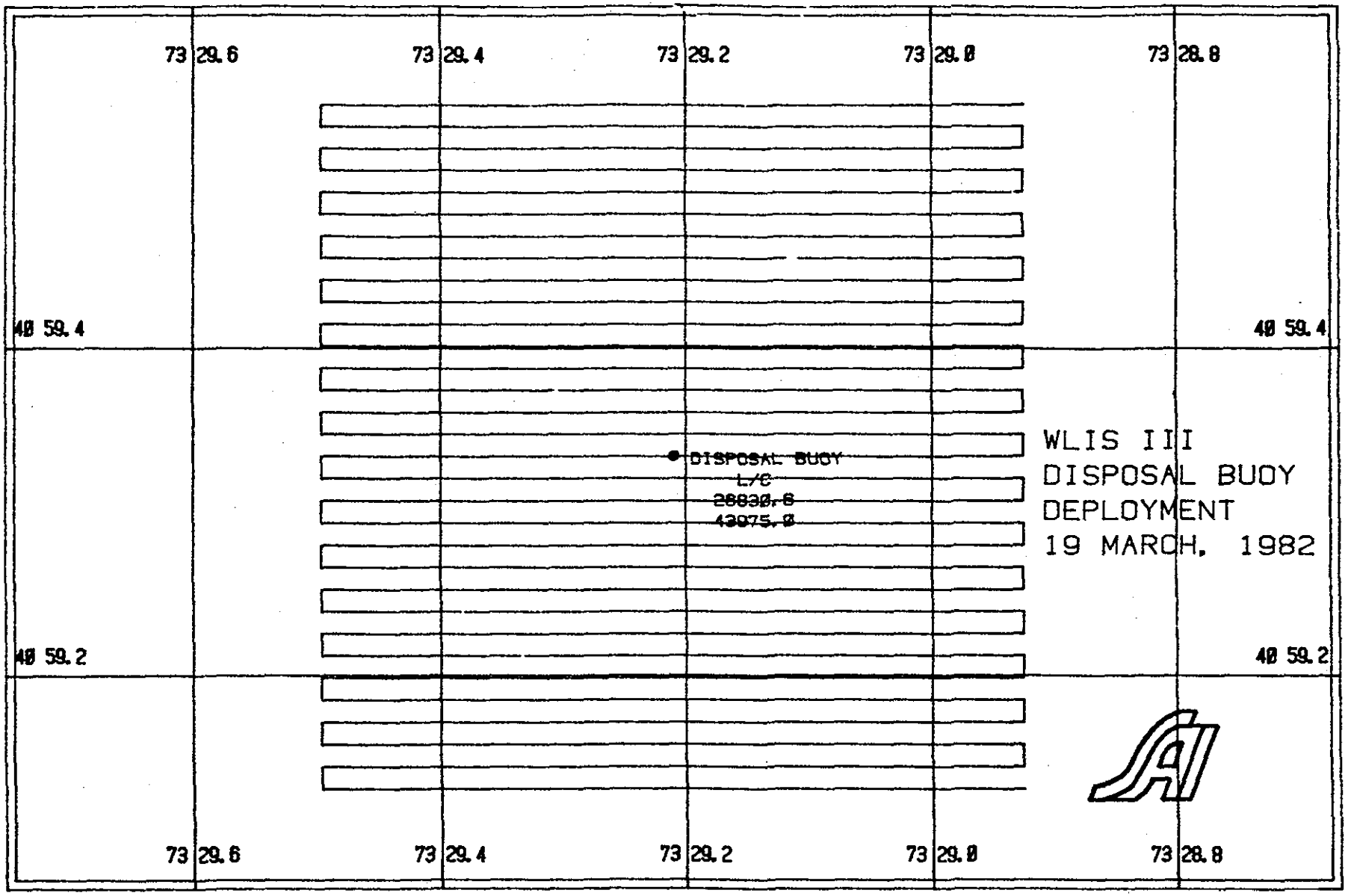

WLIS III JAN82
CHART SCALE: 1/40000
73 29.6
73 29.4
73 29.2
73 29.0
73 28.8
40 59.4
40 59.2
DISPOSAL BUOY
L/C
26830.6
43975.0
WLIS III
DISPOSAL BUOY
DEPLOYMENT
19 MARCH, 1982

Figure 4.0-3

A visual survey of the area immediately surrounding the disposal point and the intended transit route from buoy "32A" revealed only one lobster pot trawl in the area. This was located slightly more than one half mile ENE of the buoy and should not be affected by the disposal operation. However, the numbers on the marker buoys were recorded and attempts are underway to locate the owner to warn him of potential conflict with scow traffic.

5.0 SUMMARY

The deployment of disposal markers was successfully completed at the designated points in Central and Western Long Island Sound Disposal Sites on 19 March 1982. This entire effort was coordinated with the Aids to Navigation Branch of the Third Coast Guard District in New York. Copies of the application for a private aid to navigation and a letter confirming deployment are included as Appendix I.

At the present time, arrangements are underway to provide sufficient spare parts for replacement of either of these buoys within a one or two day time frame should they be damaged or lost. These arrangements should be complete before April 1, 1982.

APPENDIX I

Communications with U.S. Coast Guard
Third Coast Guard District
Aids to Navigation

March 22, 1982

Commander
Third Coast Guard District
Governors Island, NY 10004

Attn: Lt. Wilhite
Aids to Navigation

Dear Sir,

As discussed in our phone converstation on 16 March, SAI installed two (2) disposal buoys for the US Army Corps of Engineers (contract #DACW33-82-R-0002, in Long Island Sound on 19 March 1982. The buoys were placed in the Central and Western Long Island Sound Disposal Sites at the following locations:

CLIS	41°08.6'N 72°53.9'W
WLIS	40°59.34'N 73°29.21'W

Both buoys are marked "DG", have an orange & white superstructure and display a 4 second flashing white light.

The buoys will be maintained by SAI and will remain in place for an indefinite period depending on the disposal operation schedules. SAI will notify the Coast Guard prior to removal of either buoy.

Thank you for your help and cooperation.

Sincerely,

R W Morton

ROBERT W. MORTON
OCEAN SCIENCE & TECHNOLOGY DIVISION

* U.S. GOVERNMENT PRINTING OFFICE: 1980 - 714-332

DEPARTMENT OF TRANSPORTATION
COAST GUARD
2554 (Rev. 7-76)

PRIVATE AIDS TO NAVIGATION APPLICATION

(See attached instructions and copy of Code of Fed. Reg., Title 33, Chap. 1, Part 66)

Form Approved
OMB-004-R5681

PRIVATE AID TO NAVIGATION MAY BE AUTHORIZED UNLESS A COMPLETED APPLICATION FORM HAS BEEN RECEIVED (14 U.S.C. 83; 33 C.F.R. 66.01-5).

ACTION REQUESTED FOR PRIVATE AIDS TO NAVIGATION: A. [X] ESTABLISH AND MAINTAIN B. [ ] DISCONTINUE C. [ ] CHANGE D. [ ] TRANSFER OWNERSHIP

2. DATE ACTION TO START: 5 April 1982

AIDS WILL BE OPERATED: A. [X] THROUGHOUT YEAR B. [ ] TEMPORARILY UNTIL _____ C. [ ] ANNUALLY FROM _____ TO _____

NECESSITY FOR AID *(Continue in Block 8)*: See Block 8

5. GENERAL LOCALITY: Long Island So.

6. CORPS OF ENGINEERS AUTHORIZED THIS STRUCTURE OR BUOY BY [X] PERMIT OR [ ] LETTER *(file and date)*

FOR DISTRICT COMMANDERS ONLY

7. APPLICANT WILL FILL IN APPLICABLE REMAINING COLUMNS

LIGHT LIST NUMBER OR PAGE	NAME OF AID	LIGHT: NO. OR LTR. (7a)	LIGHT: PER. (7b)	LIGHT: FLASH LGTH. (7c)	LIGHT: COLOR (7d)	POSITION (7e)	DEPTH OF WATER (7f)	CANDLE POWER (7g)	HT. ABOVE WATER (7h)	STRUCTURE: TYPE, COLOR, AND HEIGHT ABOVE GROUND (7i)	REMARKS *(See Instructions)* (7j)
		D	4	0.4	WHT	40°59'20.4"N 73°29'12.6"W	115	'89	7		See Attachment international orange, reflective strips, radar reflector
		D	4	0.4	WHT	* SEE BELOW	100	89	7		Same as above

ADDITIONAL COMMENTS

To mark position for the purpose of accurate disposal of dredge spoil material per order of New England District, U.S. Army Coprs of Engineers. See attachment

Proposed position is 41°08' 35.2"N 72°53' 57.6"W but will depend on suitability of bottom topography for dredge spoil disposal.

NAME AND ADDRESS OF PERSON IN DIRECT CHARGE OF AID

Dr. Robert Morton
202 Thames St.
Newport, RI 02840

TELEPHONE NO.

401 847-4210

10a. NAME AND ADDRESS OF PERSON OR CORPORATION AT WHOSE EXPENSE AID IS MAINTAINED

Science Applications (for US Army Corps of Engineers), 202 Thames Newport, RI

10b. THE APPLICANT AGREES TO SAVE THE COAST GUARD HARMLESS WITH RESPECT TO ANY CLAIM OR CLAIMS THAT MAY RESULT ARISING FROM THE ALLEGED NEGLIGENCE OF THE MAINTENANCE OR OPERATION OF THE APPROVED AID(S).

10c. DATE: 1 March 82

10d. SIGNATURE AND TITLE OF OFFICIAL SIGNING

FOR USE BY DISTRICT COMMANDER

SERIAL NO. | CLASSIFICATION OF AIDS | RECD. | CHART | DATE APPROVED | SIGNATURE *(By direction)*