

OPERATIONAL PLAN
FOR 1997 CATEGORY II DISPOSAL MOUND
AT THE MUD DUMP SITE

21 MAY 1997

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Introduction

On 1 September 1997, the 2.2 square nautical mile (snmi) Mud Dump Site is scheduled for de-designation as an ocean disposal site for dredged material. Simultaneous with the closure of the Mud Dump Site, a 15.7 snmi Historic Area Remediation Site (HARS) will be designated. This process was set in motion by a July 1996 letter signed by the Administrator of the U.S. Environmental Protection Agency and the Secretaries of the Departments of the Army and Transportation setting forth the Administration's Plan for New York-New Jersey Harbor for sustainable port development and environmental protection of the estuary and ocean. .

This Operational Plan is tied directly to the special conditions of the Department of the Army permits for the dredging, placement, and sand capping in this project to place up to 800,000 cubic yards of Category 2 dredged material prior to 1 September 1997 and subsequent cover with a minimum of one meter of Ambrose Channel sand over all of the Category 2 material. This project is a key element of the Administration's Plan.

This Operational Plan is an oversight of the project elements and the Disposal Guidelines referred to in Special Condition (C) of the Department of the Army (DA) permits.

Management Program for the 1997 Capping Project

The ocean disposal of Category 2 dredged material is scheduled to start at the Mud Dump Site no later than May 31, 1997 and is expected to continue through the summer months. Five projects have been proposed for disposal;

1. The Port Authority of New York and New Jersey - Reach "D"	50,000 yds ³
2. Citgo	35,000 yds ³
3. The Port Authority of New York and New Jersey - CDF	580,000 yds ³
4. Exxon	52,000 yds ³
5. Mobil Oil	80,000 yds ³

Disposal Limitations

The dredged material will be disposed in an area located in the southeastern quadrant of the Mud Dump Site and capped with Ambrose Channel sand to produce a cap no less than 1 meter thick (see Special Condition (T) of the DA Permit). The disposal and capping strategy in this Operational Plan has been designed such that the dredged material mound and the required one meter of cap material will not exceed the 65 foot Below Mean Low Water management depth established in the Mud Dump Site (MDS) Site Management and Monitoring Plan (SMMP).

As per the U.S. Army Corps of Engineers, New York District (NYD) and the U.S.

Environmental Protection Agency, Region 2 (EPA) agreement, restrictions based on the STFATE Model, one component of the ADDAMS suite of mathematical models, have been imposed on the disposal activity phase of the project. The Model predicts the dilution of chemical contaminant concentrations and potential water column impacts due to toxicity over a four hour period following the disposal of a known volume of dredged material within the bounds of a selected disposal site. These restrictions include limitations on barge volume(s) which can be disposed. In the cases of the above five projects, a maximum of three (3) or four (4) barge loads (project specific) of the maximum volume of dredged material permitted based on the ADDAMS Model can be discharged during two specific periods of the daily tidal cycle (Figure 8). On the average, the New York Bight experiences two high (flood) tides and two low (ebb) tides during each tidal day. This is known as a semi-diurnal tidal period. A mean tidal day consists of 24 hours, 50.415 minutes. An average semidiurnal tidal period therefore consists of 12.4167 hours.

For the five proposed projects, the following maximum barge volumes per disposal event apply:

The Port Authority of New York and New Jersey - Reach "D"	6,000 yds ³
Citgo	3,000 yds ³
The Port Authority of New York and New Jersey - CDF	4,000 yds ³
Exxon	6,000 yds ³
Mobil Oil	3,500 yds ³

Disposal operations will be planned and coordinated with the dredging/towing contractors to ensure that no more than ten (10) days will lapse between disposals of project material (See Special Condition (S) of the DA Permit).

Capping operations will involve the placement of Ambrose Channel sand in a designated zone located in the area impacted by disposal. The size of this area will be determined by bathymetry and REMOTS[™] techniques. A series of travel lanes will be established within the area using coordinates (Lat/Long) to indicate disposal locations. Distribution of the cap material will be closely monitored by using state-of-the-art monitoring techniques during cap placement.

Category 2 Disposal Plan Outline

1. A maximum of approximately 800,000 yds³ of Category 2 dredged material is proposed for ocean disposal at the Mud Dump Site. The five projects, originating from locations in the Newark Bay Complex, including the Arthur Kill and Kill van Kull consist of;

A	The Port Authority of New York and New Jersey	Reach "D"	50,000 yds ³
B	Citgo		35,000 yds ³
C	The Port Authority of New York and New Jersey	CDF	580,000 yds ³
D	Exxon		52,000 yds ³
E	Mobil Oil		80,000 yds ³

2. A region approximately 1400 feet in the north-south direction by approximately 800 feet in the east-west direction has been selected as the appropriate disposal area within the Mud Dump Site (Figures 1 & 2). The water depths in this region range from 74 to 84 feet MLW. For disposal purposes, the area has been divided into a total of 18 cells (Figure 3), most having 200 foot by 300 foot dimensions. Initially, each barge load of dredged material will be directed to dispose into a specific cell or set of cells in a particular direction (north to south, or south to north) during a specific span of time associated with the tides. A series of five (5) surface marker buoys (1 thru 5) will be aligned in a north to south transect to denote the entrance and exit of the disposal lanes (Figures 4, 5, & 6). As the project proceeds, bouy locations and disposal cells usage will be identified by using real time information and specific computer simulations systems including a Disposal Analysis Network for New York (DAN-NY). Coordinates, in the form of Latitude and Longitude, of the five (5) marker buoys will be provided to the permittee and towing contractor prior to disposals.

The object during disposal is to create a single mound which meets the previously described height and boundary restrictions. For critical accuracy, navigation into each disposal lane must be determined by GPS/DGPS technology.

Disposal will not begin until the scow has entered a designated cell. Once the scow has completely passed the first marker buoy for the cell, disposal may begin. The disposal inspector will record the time and scow location at the beginning of disposal in the Transportation and Disposal Log.

The speed of the scow must not exceed 3 knots during disposal. The scow must be within 200 feet of the line between the two marker buoys during disposal (Figures 4, 5, & 6). Vessel speed and the distance from the buoys must also be recorded for the period of disposal.

All disposal must be completed and all scow doors must be closed before the scow reaches the last marker buoy in the lane. The disposal inspector will record in the Disposal Log the time and scow location at the end of disposal.

If wind and sea conditions at the time of disposal present a safety problem, the decision to deviate from a directed cell will ultimately rest with the captain of the vessel (See Special Condition (Q) of the DA Permit), and will be determined by that course of action which best suits the safe operation of the vessel and scow.

3. In conjunction with information obtained from other capping projects at the MDS, several mathematical models (MDFATE and LTFATE) were used to predict the behavior of the dredged material following its discharge. The results have been used to determine the Category 2 material footprint (i.e.,the mound crest, flank and apron). Approximately 240 individual disposal events using both 6,000 yds³ and 4,000 yds³ were used as input into the models. A known set of disposal events were modeled for each separate set of cells.

4. Each modeled disposal event in each cell was assigned a unique disposal point within the grid. The locations for each disposal buoy were plotted over the entire area and for each phase of

the disposal. Tidal regime restrictions have been factored into the disposal activity as well as the sediment/dredged material properties.

5. Pre-activity coordination with the Caven Point Marine Terminal (including Plant Branch and Survey Section) has been accomplished. Corps vessel support for both monitoring activities and disposal site surveillance has been arranged. Surface marker buoys will be placed prior to the commencement of disposal activities and maintained by the NYD.

6. In the absence of actual post Category 2 disposal data, this Operational Plan will describe general preliminary/tentative aspects of the capping phase. The plan assumes that the Category 2 dredged material will be removed mechanically (i.e., clamshell bucket), placed in a barge/scow and towed using a tugboat to the disposal site. The cap material will be removed from the Ambrose Channel and placed at the site by hopper dredge. The extent of the final cap required will be directly dependent on the accuracy of placement of the Category 2 disposals.

7. This Operational Plan, which includes narratives detailing the monitoring, disposal and capping phases will be presented to the permittee and their respective representatives, agents and dredging/towing contractors. This will ensure that the responsibilities of each permittee and contractor are understood and consistent with normal operating procedures.

Monitoring Program for the 1997 Capping Project

A series of monitoring efforts, ranging from pre-disposal surveys at the designated Category 2 disposal location at the MDS through post-cap surveys, have been established as follows:

Baseline Monitoring

Prior to the disposal of Category 2 sediment, a series of biological, chemical and physical oceanographic surveys of a specified region of the Mud Dump Site will be performed. This area is approximately 2,900 m in the north-south direction by 2600 m in the east-west direction. The area encompasses the full width of the MDS and extends approximately 500 m east, and 500 m south of the MDS boundaries. Two reference areas located adjacent to the Mud Dump Site, one nearfield and one farfield, will also be surveyed.

Bathymetry: For bathymetric survey operations, 103 north-south survey lanes spaced at 25 m intervals will be traversed by the vessel in order to acquire high-resolution bathymetric data throughout the survey area delineated above (Figures 10-12). The average vessel speed will not exceed 5 knots during survey operations to ensure good spatial resolution of soundings.

Video Imagery and REMOTStm: Both a video reconnaissance and sediment profile imagery will be performed in order to initially map the various heterogeneous sediment types found in the survey area (Figures 10-12). In subsequent surveys (i.e., interim, post-disposal/pre-cap, and post-cap) these techniques will be used to determine the extent of thin dredged material layer coverage at both the flanks and apron areas and the transition points of where the footprint ends. A total of 90 stations will be occupied. Data obtained will provide information regarding the accuracy of the dredging/towing contractors disposal and capping techniques through evidence of distinct layers of deposited dredged material at the points of disposal and at the mound flanks.

Bulk Sediment: A total of 10 sediment grab samples, to a sub-bottom sediment depth of 10 cm will be collected from the Mud Dump Site and analyzed, for grain size, % total organic carbon (TOC), and chemical contaminants including dioxin (2,3,7,8-TCDD) and furan (2,3,7,8-TCDF) and their respective isomers required in our ocean disposal testing program. Three distinct areas (Figure 10), surrounding and adjacent to the proposed base mound location will be surveyed. Two reference areas with 10 sampling sites in each will also be surveyed. The required detection limit for dioxin using EPA Method #8290 in sediments is 1 part per trillion (ppt). Results will be reported on both a wet weight and dry weight basis.

Body-Burden Analyses: A total of 9 sets of tissue samples will be obtained at the Mud Dump Site and two reference areas (Figure 11). Sufficient biomass (>30 g) will be collected at each station in order to supply an adequate amount of polychaete worm tissue necessary for the analyses. Depending upon the density and abundance of each taxa found, benthic infauna (deposit feeding worms), may be composited to acquire the prescribed amount. Dry weight dioxin and furan concentration data will reveal the level and extent of in-situ contamination. The fringe or perimeter areas around the point of disposal are of particular interest. Results will also be reported on a wet and dry weight basis.

Geotechnical Analyses: 10 sediment cores will be collected at selected sites within the region of the base mound inside the Mud Dump Site around the proposed points of disposal (Figure 10) and analyzed for various geotechnical properties. The actual depth of penetration is expected to be between 6 feet and 10 feet in length. Sub-samples within the core profile will be taken and analyzed for dioxin and furan at distinct sedimentary horizons within the core profile or at standard 10 cm intervals. Sub-samples will also be analyzed for geotechnical properties.

Interim Monitoring

During the disposal of the Category 2 dredged material modified bathymetric surveys will be conducted at various intervals throughout the course of the activity. The project does include a specific Mid-Point Hydrographic Survey to affirm project progress when approximately 50% of the Category 2 dredged material has been placed. The area of concern will encompass a portion of the baseline survey area.

Post-Disposal/Pre-cap Monitoring

A post-disposal/pre-cap series of surveys will be completed within the ten (10) days following the last barge load of Category 2 material. The types of surveys will include those accomplished during the baseline phase with one addition, a sub-bottom profile survey. The level of detail will be slightly modified based on the results of the interim phase monitoring. Information will be used to determine the distribution of Category 2 dredged material so that an outline of the footprint area to be capped can be made.

Cap Placement Oversight and In-Progress Surveys

During cap placement, the permittee will be responsible for conducting a series of operational bathymetric surveys, in accordance with NYD prescribed standards, of the Category 2 mound footprint area. The frequency of these surveys will be spaced uniformly over the course of the cap placement to allow the permittee to control the placement of sand and achieve a minimum of a meter of cap. The NYD reserves the right to conduct confirmatory field surveys consisting of bathymetry, video and REMOTStm to verify and ensure that accurate and complete distribution of the cap material is being accomplished. Results of the operational bathymetric surveys may affect the placement of the cap sand and may cause the capping contractor to adjust or modify their approach for placement of cap sand.

Final Cap Surveys and Monitoring

Following the placement of the cap material, the permittee will be required to verify, by accepted bathymetric means, that one meter of cap material has been placed over the entire footprint of the Category 2 mound (See Special Condition (U) of the DA Permit). This bathymetry will be performed in accordance with NYD prescribed standards, and the results presented in a format prescribed by the NYD. If, in fact, it has been demonstrated to the satisfaction of NYD and EPA2 that the cap consists of one meter everywhere over the Category 2 mound footprint (See Special Condition (T) of the DA Permit), the NYD will then perform a comprehensive post-cap survey consisting of :

Bathymetry
REMOTStm
Video

If these surveys detect exposed or uncovered Category 2 dredged material or that the minimum cap thickness has not been achieved, additional cap material will be placed by the permittee at the deficient areas. When final cap thickness has been verified and confirmed by the NYD and no additional cap material will be required, the NYD will perform the following analyses:

Bulk Sediment
Body Burden
Subbottom
Coring

These will be utilized to determine the effectiveness of the capping operation through evidence of dredged material distribution over the impacted areas. Test and reference areas surveyed will be the same. Placement of any additional cap material will take place as soon as possible but no later than ten (10) days after survey information is received.

In the event that a major coastal storm (e.g., northeaster, hurricane) of extreme magnitude or intensity occurs, an immediate management decision to re-assess the integrity of the disposal mound and/or cap using precision bathymetry and REMOTS[™] will be undertaken in accordance with the monitoring responsibilities and specific planned activities detailed in the February 19th 1997 Mud Dump Site Management and Monitoring Plan (SMMP) (*page 26 -- Trigger Levels*).

Operational Category 2 Capping Plan Outline

The following strategy will be used for the placement of cap material from Ambrose Channel for this 1997 Capping Project.

1. The use of a hopper dredge for both the removal and placement of the cap material has been specified.
2. The surface area of the Category 2 mound footprint, including the flank and apron, will be confirmed and field verified using precision bathymetric and REMOTS[™] techniques starting immediately (e.g., within 1-2 days) after disposal of the last barge load of the Category 2 sediment. These analyses will precisely determine the configuration of the mound created by the disposed dredged material. Using the information on mound dimensions, a base map containing a cell or grid structure similar in dimension to that designed for the disposal phase of the project will be set up and drawn over the base mound. Once this has been achieved, a series of north-south trending lanes, approximately 100 feet in width, will be overlaid (Figure 13). Each lane will be located over a portion of the mound and will be designated by a unique number. Coordinates (Latitude and Longitude) of the beginning and end of each lane will be determined from this bathymetric grid. The length of each lane will vary depending upon the configuration of the base mound.

For each trip to the disposal site, a particular lane for cap placement will be indicated. The hopper dredge must remain within the boundaries of the assigned lane until placement of the cap material is complete. A specific release rate for disposal of the material will be indicated.

Similar to disposal operations for the dredged material, the speed of the hopper dredge must not exceed 3-5 knots during cap placement. Speed of the vessel and the position within the disposal lane are critical for cap placement and will be verified by the onboard disposal inspector. The disposal

inspector will record the time and scow location upon entering and exiting each lane.

Any departures from these conditions, except for safety reasons as explained in the Special Conditions (Q) of the DA Permit will be considered a compliance violation and thereby subject to enforcement procedures.

3. The aspects and details of the Capping Plan will be very closely coordinated with the permittees and dredging/towing contractor responsible for cap placement. During these discussions design parameters and standard operating procedures will be presented. Adjustments to the capping operation will occur based upon post-cap monitoring field data results. The permittee will be informed of any modifications.

The above plan is subject to modification if conditions change during the course of this activity.

**Corner Positions of Category 2 Disposal Location
(see Figure 2)**

Position	Latitude (N)	Longitude (W)
A	40°22.368'	73°50.367'
B	40°22.138'	73°50.367'
C	40°22.138'	73°50.538'
D	40°22.344'	73°50.538'
E	40°22.344'	73°50.495'
F	40°22.369'	73°50.495'

Locations for Disposal Buoys
(See Figure 7)

Point	Lat Deg	Lat Min	Lat Sec	Long Deg	Long Min	Long Sec	Lat Deg	Lat Min	Long Deg	Long Min	Easting	Northing	Depth
1	40	22	22.07227	73	50	27.10910	40	22.368	73	50.452	1028592	75138	79.13
2	40	22	19.10788	73	50	27.14198	40	22.318	73	50.452	1028590	74838	79.57
3	40	22	16.15334	73	50	27.14900	40	22.269	73	50.452	1028590	74539	79.32
4	40	22	13.18893	73	50	27.15604	40	22.220	73	50.453	1028590	74239	77.05
5	40	22	10.21462	73	50	27.16310	40	22.170	73	50.453	1028590	73938	75.58
6	40	22	19.12133	73	50	29.71296	40	22.319	73	50.495	1028391	74839	78.36
7	40	22	16.15691	73	50	29.71997	40	22.269	73	50.495	1028391	74539	75.88
8	40	22	13.20237	73	50	29.72696	40	22.220	73	50.495	1028391	74240	74.62
9	40	22	10.23795	73	50	29.73397	40	22.171	73	50.496	1028391	73940	72.93
10	40	22	22.05880	73	50	24.53808	40	22.368	73	50.409	1028791	75137	80.18
11	40	22	19.09442	73	50	24.57100	40	22.318	73	50.410	1028789	74837	80.63
12	40	22	16.13000	73	50	24.57807	40	22.269	73	50.410	1028789	74537	80.95
13	40	22	13.18535	73	50	24.58509	40	22.220	73	50.410	1028789	74239	80.42
14	40	22	10.22093	73	50	24.59217	40	22.170	73	50.410	1028789	73939	79.75

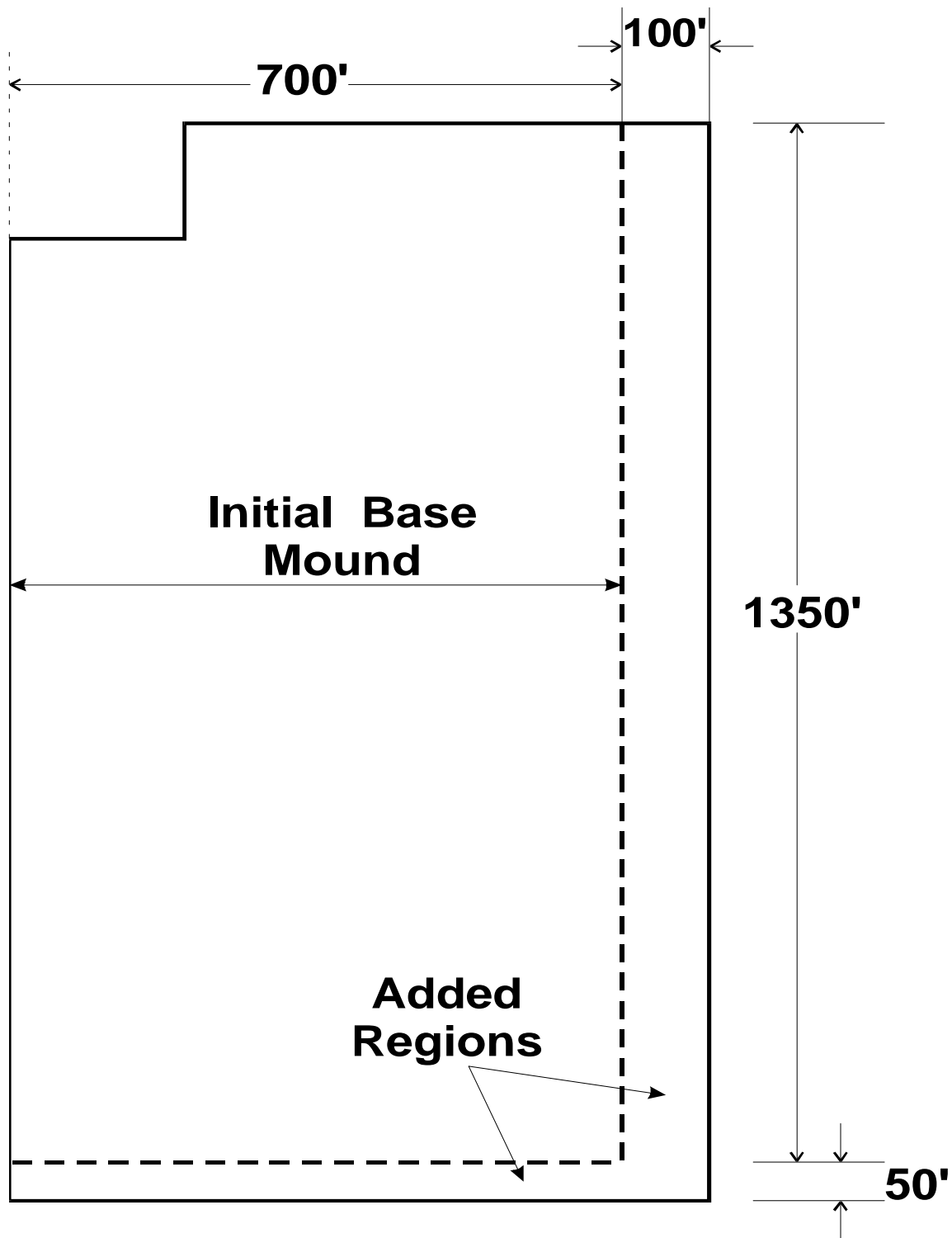


Figure 1

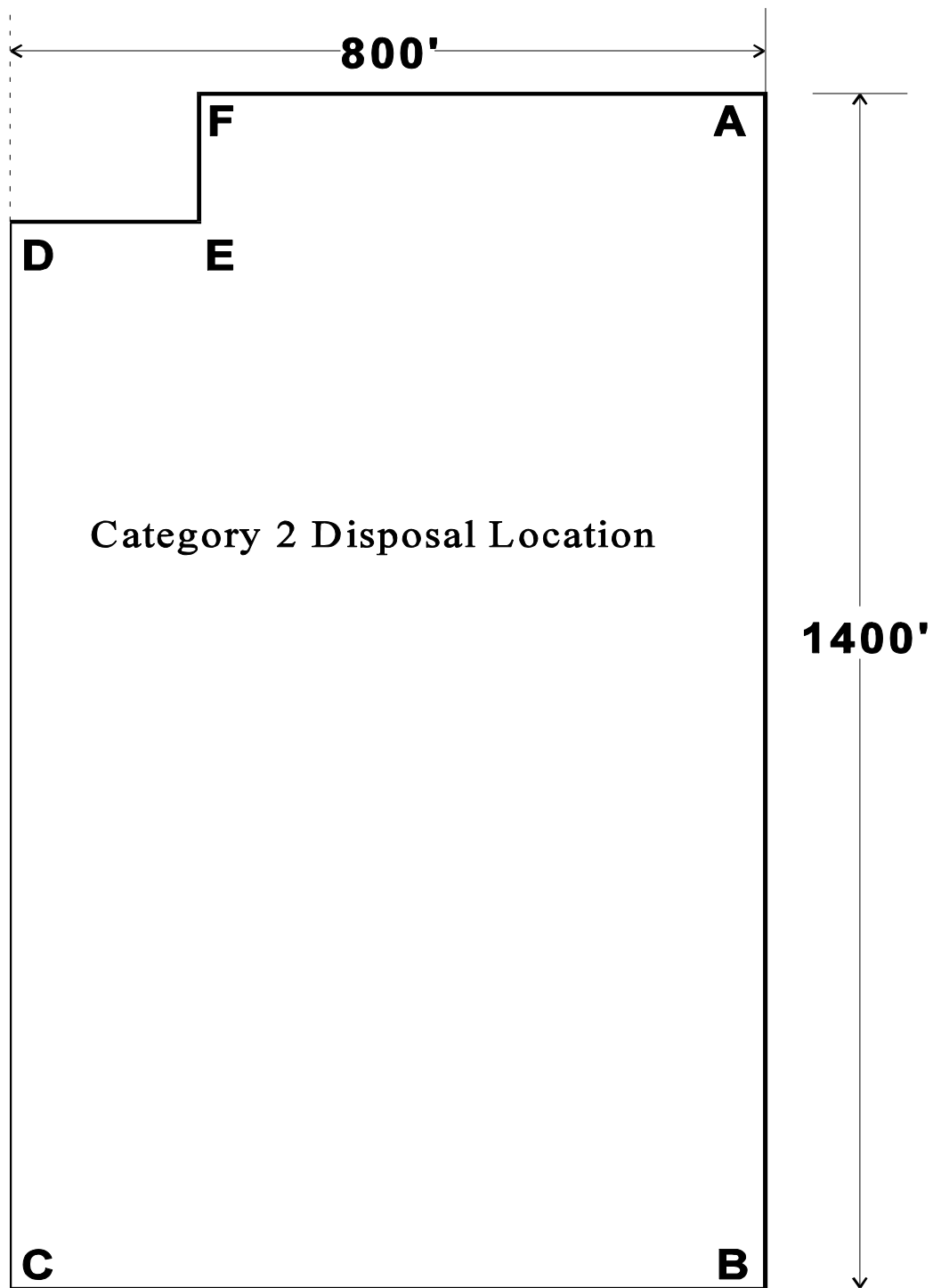


Figure 2

Disposal Cells

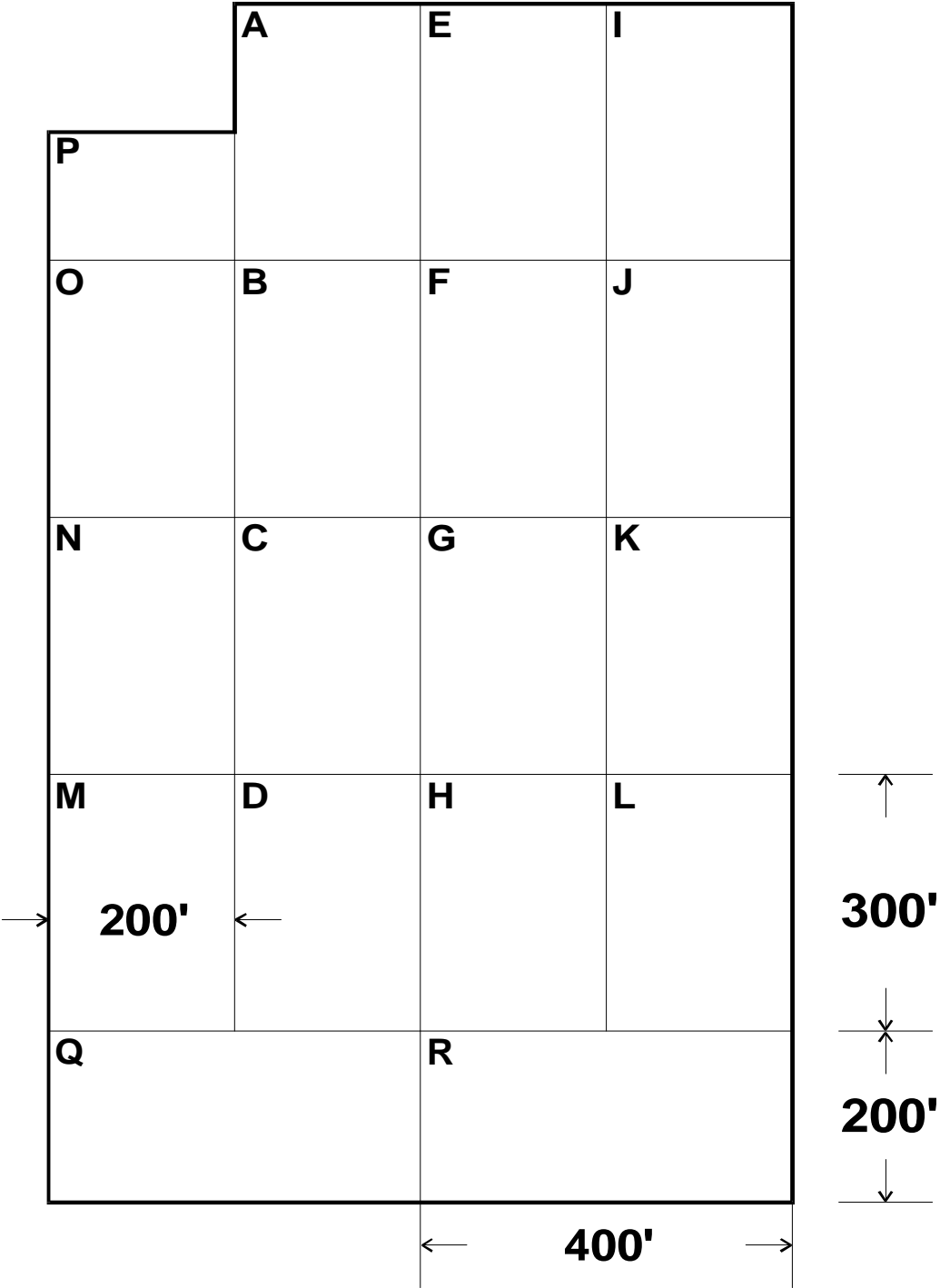
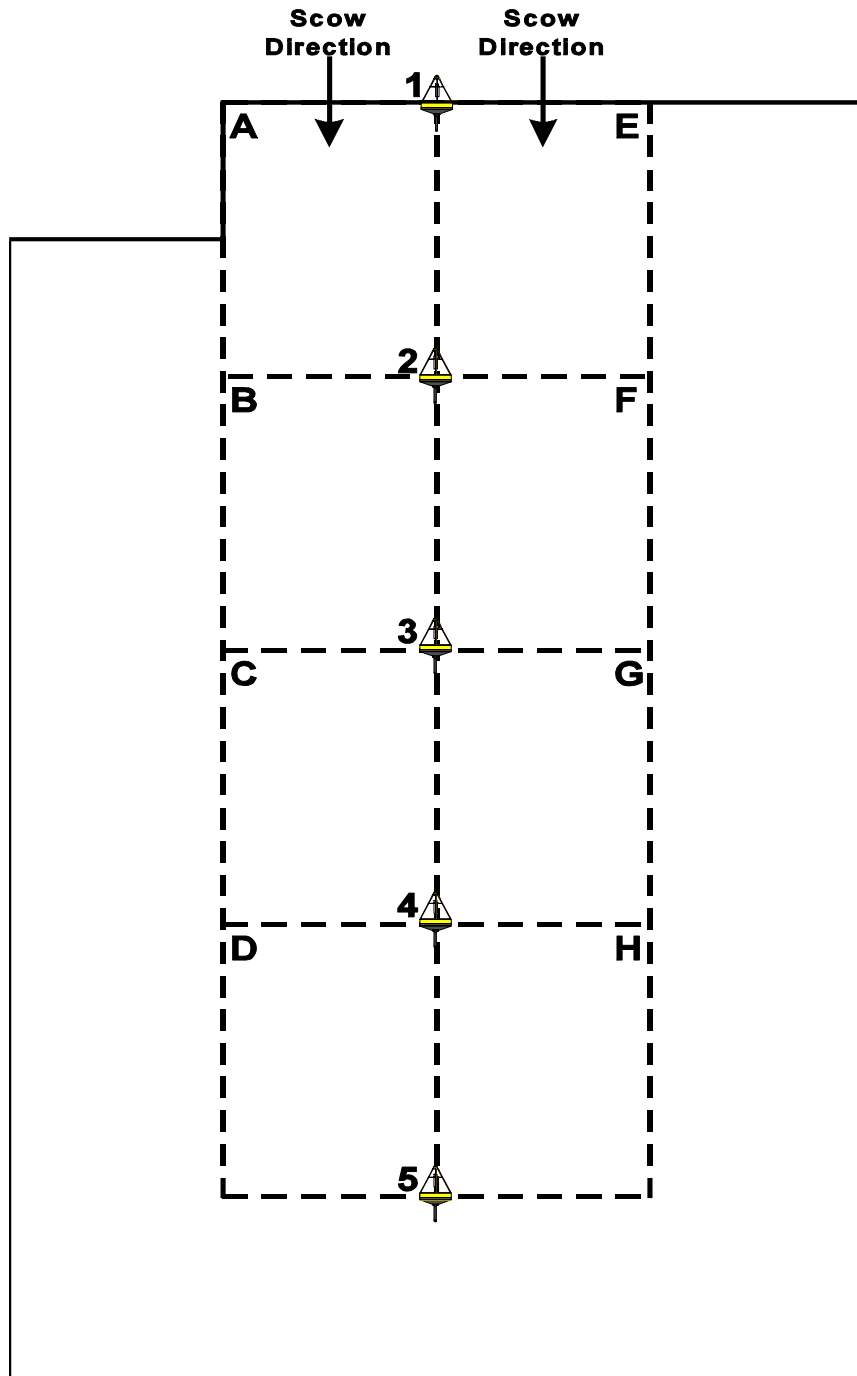


Figure 3

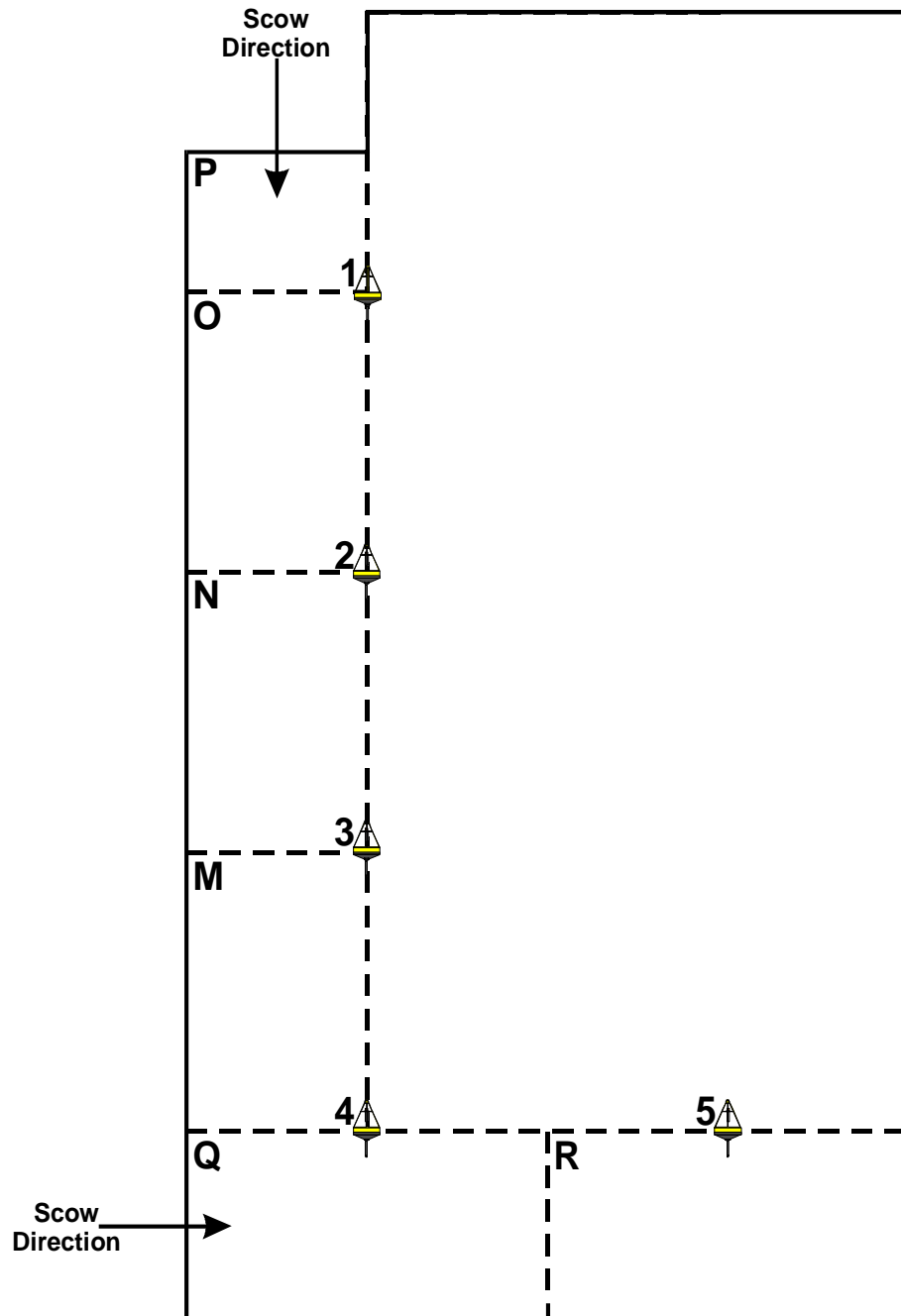
Initial Buoy Placement



Disposal in Cells A through H

Figure 4

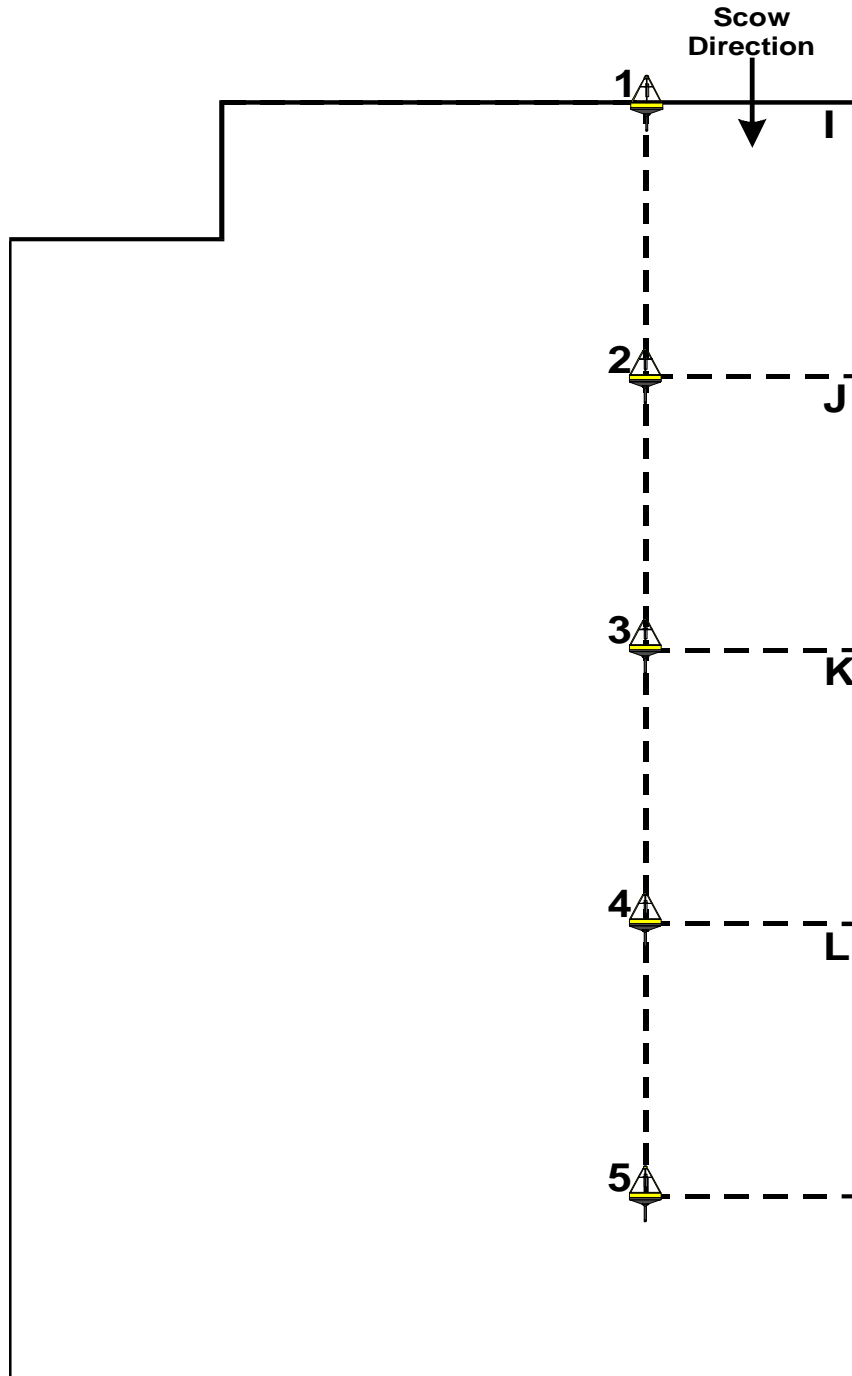
Second Buoy Placement



Disposal in Cells M through R

Figure 5

Third Buoy Placement



Disposal in Cells I through L

Figure 6

Buoy Locations

	1	10	
6	2	11	
7	3	12	
8	4	13	
9	5	14	

Figure 7

New York Mud Dump Site

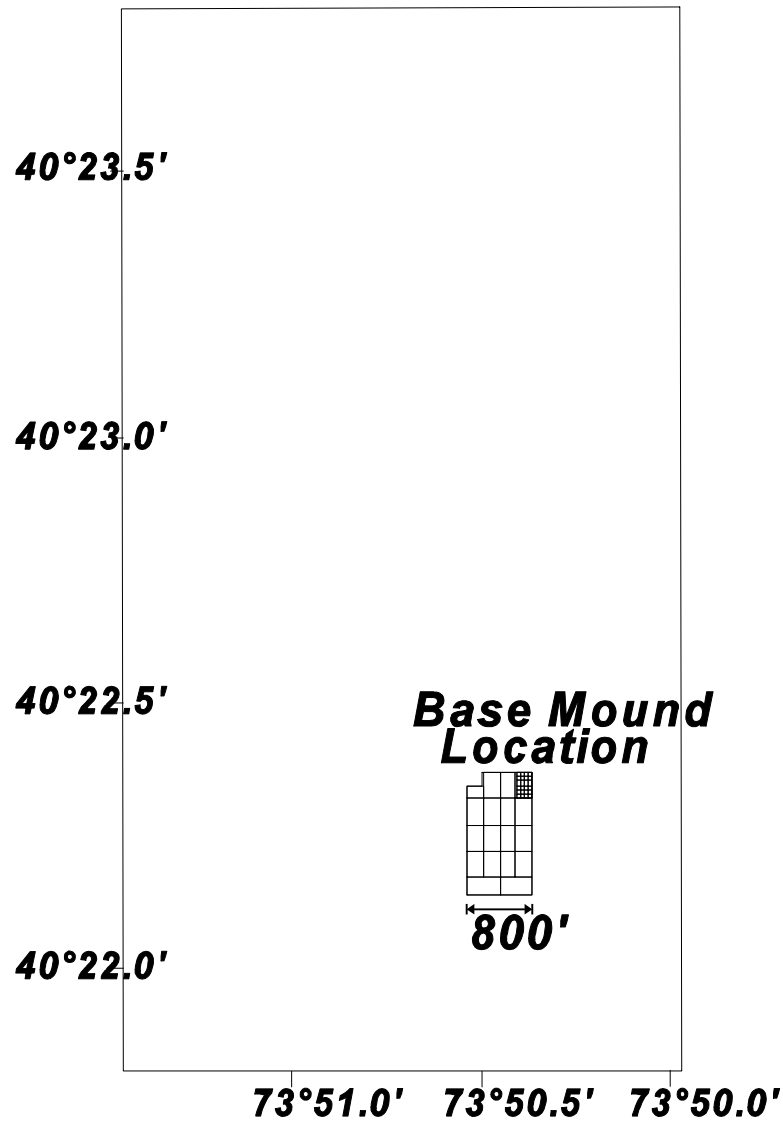


Figure 8