4/27/37

BENEFITS OF UNDERWATER BERMS

SLIDE 1 I AM HERE TODAY TO TALK WITH YOU ABOUT USING DREDGED MATERIAL TO BUILD UNDERWATER BERMS. USING DREDGED MATERIAL IN THIS MANNER HAS A NUMBER OF POTENTIAL BENEFITS TO THE CORPS DREDGING PROGRAM, OUR COST SHARING PARTNERS, AND THE ENVIRONMENTAL RESOURCE AGENCIES. SPECIFICALLY, I WILL TALK ABOUT JOINT EFFORTS COORDINATED BY THE DREDGING DIVISION OF THE WATER RESOURCES SUPPORT CENTER INVOLVING THE MOBILE DISTRICT, SOUTH ATLANTIC DIVISION AND THE RESEARCH COMMUNITY REPRESENTED BY THE DIRECTORATE OF RESEARCH AND DEVELOPMENT AND THE WATERWAYS EXPERIMENT STATION. THE PURPOSE OF THESE EFFORTS IS TO DEMONSTRATE THE FEASIBILITY AND BENEFITS ASSOCIATED WITH THE BERM CONCEPT. BEFORE DESCRIBING THESE EFFORTS, I WOULD LIKE TO GIVE YOU SOME BACKGROUND ON THE BERM CONCEPT AND PREVIOUS WORK WE HAVE DONE IN THIS AREA.

SLIDE 2 THE UNDERWATER BERM CONCEPT, AS WITH ANY OTHER BENEFICIAL USE CONCEPT, IS TO <u>USE</u> DREDGED MATERIAL RATHER THAN JUST <u>DISPOSE</u> OF IT. FOR THE MOST PART, MAINTENANCE AND NEW WORK DREDGED MATERIAL IS UNCONTAMINATED AND SUITABLE FOR A WIDE RANGE OF PRODUCTIVE USES. DREDGED MATERIAL SHOULD THEREFORE BE CONSIDERED A RESOURCE. ONE WAY WE CAN USE THIS RESOURCE IS TO BUILD FEATURES UNDER WATER IN THE SHAPE OF BERMS.

SLIDE 3 WHAT IS A BERM? A BERM IS AN UNDERWATER MOUND CONSTRUCTED FROM DREDGED MATERIAL TO A SPECIFIED DESIGN.

SLIDE 4 AT MANY NAVIGATION PROJECTS, LARGE QUANTITIES OF DREDGED MATERIAL ARE PRESENTLY BEING TRANSPORTED MANY MILES TO OFFSHORE SITES. THIS RESULTS IN A SIGNIFICANT COST FACTOR AND MAKES THE

MATERIAL UNAVAILABLE FOR BENEFICIAL USES. PLANS FOR SOME OF THE DEEPENING PROJECTS WOULD CONTINUE THIS TRADITIONAL PRACTICE. IN CONTRAST, UNDER THE BERM CONCEPT WE WOULD PLACE MATERIAL IN THE NEARSHORE ZONE CLOSER TO THE NAVIGATION PROJECT.

SLIDE 5 AS AN EXAMPLE, AT ONE MAJOR DEEPENING PROJECT WITH A TOTAL ESTIMATED COST OF $550 MILLION, THE LONG TERM DISPOSAL AREA SHOWN AS A BLUE CIRCLE IS ALMOST 30 MILES FROM THE DREDGING PROJECT. BY INCREASING THE CAPACITY OF AN EXISTING SMALLER DISPOSAL SITE, SHOWN IN GREEN, THROUGH AN EXTENSION TO THE AREA SHOWN IN RED, HAUL DISTANCE COSTS CAN BE REDUCED WITH A RESULTING TOTAL PROJECT COST REDUCTION OF $50 MILLION OR MORE. FURTHERMORE, A VALUABLE SAND RESOURCE CAN BE RETAINED IN THE COASTAL REGIME.

SLIDE 6 WHY IS THE CORPS INTERESTED IN UNDERWATER BERMS? BECAUSE WE WANT TO BE PROACTIVE AND LOOK FOR OPPORTUNITIES TO ACCOMPLISH OUR MISSION MORE COST EFFECTIVELY, IN AN ENVIRONMENTALLY RESPONSIBLE MANNER, AND TO PRACTICE BENEFICIAL USES APPLICATIONS OF DREDGED MATERIAL.

SLIDE 7 WE HAVE ENORMOUS OPPORTUNITY WITHIN THE CORPS DREDGING PROGRAM TO BUILD UNDERWATER BERMS. PRESENTLY, THE CORPS DREDGES ABOUT 300M CY PER YEAR OF WHICH 50M CY IS DISPOSED IN THE OCEAN. PL 99-662 AUTHORIZES ADDITIONAL DREDGING OF MORE THAN 1 BILLION CY OF MATERIAL. OBVIOUSLY, THE NEW WORK DREDGING WILL BE ACCOMPLISHED IN PHASES OVER A MULTI-YEAR PERIOD. DREDGING BY OTHERS TOTAL 100 TO 150M CY PER YEAR. THE NAVY, FOR EXAMPLE HAS AN EXTENSIVE MAINTENANCE DREDGING PROGRAM AND IS PLANNING SOME MAJOR NEW WORK

AND DEEPENING PROJECTS ASSOCIATED WITH ITS HOMEPORTING PROGRAM.

SLIDE 8 THERE ARE TWO APPROACHES TO CONSTRUCTION OF UNDERWATER BERMS, WE REFER TO THEM AS FEEDER AND STABLE.

SLIDE 9 THE FEEDER APPROACH INVOLVES RELATIVELY SHALLOW WATER PLACEMENT WHERE THE MATERIAL COULD MOVE TOWARD SHORE. MATERIAL WOULD BE LIMITED TO BEACH QUALITY SAND.

SLIDE 10 THE STABLE BERM INVOLVES PLACEMENT IN DEEPER WATER LESS SUBJECT TO WAVES AND CURRENTS. THEREFORE, THE MATERIAL STAYS IN PLACE. A WIDE VARIETY OF DREDGED MATERIAL CAN BE USED IN THE CONSTRUCTION OF STABLE BERMS.

SLIDE 11 THE PRIMARY BENEFIT OF FEEDER PLACEMENT IS TO ADD SAND TO THE NEARSHORE ZONE SO THAT IT CAN POTENTIALLY HELP REDUCE EROSION OF NEARBY BEACHES. IN MANY CASES DREDGING COSTS CAN BE REDUCED BECAUSE NEARSHORE SITES ARE GENERALLY CLOSER TO THE NAVIGATION CHANNEL.

SLIDE 12 A STABLE BERM WOULD BE A SIGNIFICANT, RELATIVELY PERMANENT BOTTOM FEATURE THAT COULD DISSIPATE STORM WAVES AND THUS CONTRIBUTE TO A REDUCTION IN SHORELINE EROSION RATES. THERE COULD BE A ZONE OF REDUCED WAVE ENERGY BETWEEN THE COMPLETED BERM AND THE SHORELINE IN WHICH ADDITIONAL MATERIALS COULD BE STOCKPILED FOR FUTURE BEACH NOURISHMENT. CONVENTIONAL PIPELINE DREDGES COULD RECOVER THIS MATERIAL FOR DIRECT PLACEMENT ON THE BEACHES. FISHERY BENEFITS ARE ALSO EXPECTED AS TOPOGRAPHIC IRREGULARITIES ARE CREATED ON THE OCEAN FLOOR, ENHANCING THE FISHERY HABITAT. SIMILAR ENHANCEMENTS HAVE BEEN OBSERVED AT A NUMBER OF CORPS OCEAN DISPOSAL SITES DURING RECENT DESIGNATION SURVEYS CONDUCTED BY EPA. AS MENTIONED FOR THE FEEDER, DREDGING COST SAVINGS WILL OCCUR IF HAUL DISTANCES ARE

REDUCED.

SLIDE 13 IN 1982, THE WATER RESOURCES SUPPORT CENTER ARRANGED FOR THE NORFOLK DISTRICT AND THE COASTAL ENGINEERING RESEARCH CENTER TO CONDUCT A PILOT STUDY 4 MILES OFFSHORE OF VIRGINIA BEACH IN THE EXISTING DAM NECK OCEAN DISPOSAL SITE. THE PURPOSE OF THE PILOT STUDY WAS TO DETERMINE ON A SMALL SCALE WHETHER MOUNDING COULD BE ACHIEVED WITH MAINTENANCE MATERIAL USING CONVENTIONAL EQUIPMENT. CONSTRUCTION OF AN UNDERWATER FEATURE DEPENDS VERY MUCH ON PRECISE CONTROL OVER THE EXACT POSITION OF RELEASE. USUALLY DISPOSAL AREAS ARE VERY LARGE AND NO SPECIAL EFFORT IS MADE TO RELEASE THE MATERIAL IN ANY PARTICULAR PLACE WITHIN THE OVERALL DESIGNATED AREAS. AT DAM NECK, APPROXIMATELY 20M CY HAD BEEN DEPOSITED OVER A 20 YEAR PERIOD, CREATING ONLY A BROAD HILL WITH VERY LITTLE RELIEF.

SLIDE 14 DREDGING AND DISPOSAL AT DAM NECK WAS ACCOMPLISHED BY THE SUGAR ISLAND AND THE MANHATTAN ISLAND, TWO SELF PROPELLED, SPLIT HULL INDUSTRY HOPPER DREDGES. ABOUT 845,000 CY OF SILT AND FINE SAND WERE DEPOSITED BETWEEN AUGUST AND NOVEMBER 1982. THE DREDGING CONTRACT REQUIRED TWO SPECIFIC "POINT DUMP" DISPOSAL SITES WITHIN THE DAM NECK SITE IN 34 TO 36 FOOT WATER DEPTHS. AT ONE SITE THE DREDGE WAS REQUIRED TO STOP BEFORE RELEASING MATERIAL AND AT THE OTHER THE DREDGE ONLY SLOWED BEFORE DUMPING. THIS REQUIREMENT WAS MADE TO DETERMINE IF THE TWO MODES OF RELEASE WOULD RESULT IN MEASUREABLE DIFFERENT BOTTOM DEPOSITS. INTERIM SURVEYS INDICATED IDENTICAL MOUNDING FROM BOTH RELEASE MODES; THEREFORE, THE REMAINDER OF THE JOB WAS PERFORMED BY DUMPING WHILE UNDERWAY AS THIS IS THE LEAST COSTLY METHOD. THE MATERIAL PRODUCED A MOUND HAVING ABOUT

11 FEET OF RELIEF TO THE 23-FOOT CONTOUR WITH 1:130 SIDE SLOPES, AND COVERED AN AREA 1600 FT BY 2800 FT.

SLIDE 15 THE NORFOLK PILOT STUDY CLEARLY INDICATES THAT THE HOPPER DREDGES AND POSITIONING EQUIPMENT ROUTINELY USED BY INDUSTRY ARE CAPABLE OF CONSTRUCTING A MOUND. ANOTHER IMPORTANT FINDING WAS THAT A SIGNIFICANT FEATURE CAN BE CREATED EVEN WHEN THE PLACEMENT MATERIAL IS A MIXTURE OF FINE SAND AND SILT. EQUALLY IMPORTANT IS THE FACT THAT THE MOUND HAS BEEN STABLE ALTHOUGH SUBJECTED TO OCEAN STORM CONDITIONS; THREE HURRICANES HAVE OCCURRED SINCE CREATION OF THE MOUND IN 1982.

SLIDE 16 THE WATER RESOURCES SUPPORT CENTER HAS BRIEFED THE ENVIRON_ MENTAL ADVISORY BOARD AND THE COASTAL ENGINEERING RESEARCH BOARD AS TO THE FEASIBILITY AND POTENTIAL BENEFITS OF BERM CONSTRUCTION. BOTH OF THESE TECHNICAL ADVISORY GROUPS TO THE CHIEF OF ENGINEERS HAVE ENDORSED THE BERM CONCEPT IN PRINCIPLE. IN ADDITION, THE NATIONAL MARINE FISHERIES SERVICE HAS INDICATED THAT THE STABLE BERM MAY CONTRIBUTE TO AN IMPROVED FISHERIES HABITAT.

SLIDE 17 BASED ON THE POSITIVE RESULTS OF THE NORFOLK EFFORT AND THESE ENDORSEMENTS, GENERAL HATCH, DIRECTOR OF CIVIL WORKS, APPROVED A NATIONAL DEMONSTRATION PROJECT TO ASSESS AND DOCUMENT PHYSICAL AND BIOLOGICAL EFFECTS ASSOCIATED WITH AN UNDERWATER BERM.

SLIDE 18 THE NATIONAL DEMONSTRATION WILL BE CONDUCTED AT MOBILE HARBOR. WHY MOBILE? BECAUSE THE MOBILE DISTRICT HAS RESPONDED INNOVATIVELY TO THE ENVIRONMENTAL CHALLENGES BROUGHT ABOUT BY NEPA AND THE CWA, INCLUDING THE DEVELOPMENT OF IMPROVED DREDGING AND DISPOSAL EQUIPMENT AND PROCEDURES,AND LONG-TERM MAINTENANCE PLANS. IN THIS PROCESS, THE MOBILE DISTRICT HAS NURTURED A LONGSTANDING AND PRODUCTIVE ASSOCIATION WITH THE APPLIED R&D COMMUNITY. MOBILE DISTRICT DECIDED TO DEMONSTRATE BOTH BERM APPROACHES AT MOBILE HARBOR

WHILE MOBILE HARBOR DOES NOT OFFER THE LARGE SCALE COST SAVINGS THAT APPEAR POSSIBLE AT OTHER LOCATIONS, THE INFORMATION OBTAINED THROUGH THIS DEMONSTRATION WILL HAVE NATIONWIDE APPLICATION.

SLIDE 19 BEFORE INITIATING THE DEMONSTRATION, MOBILE DISTRICT COORDINATED WITH THE LOCAL CONGRESSIONAL OFFICES, THE LOCAL SPONSOR, AND NAVIGATION AND ENVIRONMENTAL INTERESTS ON NUMEROUS OCCASIONS AS INDICATED ON THE SLIDE. THE COORDINATION AND BRIEFINGS THAT OCCURRED RESULTED IN SUPPORT FOR THE DEMONSTRATION BY ALL INTERESTS.

SLIDE 20 THE LOCATIONS OF THE DEMONSTRATION ACTIVITIES ARE OFF THE COAST OF DAUPHIN ISLAND, ALABAMA, AS SHOWN BY THE RED SHADED AREA.

SLIDE 21 THIS SHOWS THE LOCATIONS OF THE FEEDER AND STABLE BERMS. SAND ISLAND IS PART OF THE EXTENSIVE MOBILE TIDAL DELTA, AND HAS EXPERIENCED RAPID EROSION DURING THE LAST TWO DECADES. IT PRESENTLY IS AN UNDERWATER SANDBAR WITH ONLY PELICAN ISLAND TO THE WEST BEING EMERGENT.

SLIDE 22 WE EXPECT THE FEEDER BERM MATERIAL TO MOVE TOWARD DAUPHIN ISLAND GENERALLY AS SHOWN BY THE ARROWS DUE TO THE PREDOMINANT WESTWARD LONGSHORE CURRENTS. THIS WOULD BENEFIT DAUPHIN ISLAND WHICH HAS ALSO EXPERIENCED EXTENSIVE EROSION DUE TO RECENT HURRICANES.

SLIDE 23 THE FEEDER BERM WAS CONSTRUCTED WITH SANDY MAINTENANCE MATERIAL FROM THE OUTER BAR AS PART OF A ROUTINE MAINTENANCE DREDGING CONTRACT. IT WAS COMPLETED IN FEBRUARY 1987. APPROXIMATELY 450,000 CY OF MATERIAL WAS PLACED IN 18 - 19 FEET OF WATER TO FORM A BERM ABOUT 6 FEET IN HEIGHT AND ONE MILE IN LENGTH.

SLIDE 24 TWO SHALLOW DRAFT INDUSTRY HOPPER DREDGES PERFORMED THE WORK. THESE DREDGES HAVE A SPLIT HULL DESIGN WHICH IS TYPICAL OF MOST

OF THE MODERN FLEET. THIS DESIGN GREATLY REDUCES THE DRAFT REQUIREMENTS OF THE VESSELS, AND IS PARTICULARLY USEFUL FOR BERM CONSTRUCTION IN SHALLOW WATERS.

SLIDE 25 A STABLE BERM WILL BE CONSTRUCTED APPROXIMATELY 3 MILES FROM SAND ISLAND DURING PHASE I OF THE DEEPENING PROJECT AT MOBILE HARBOR. WORK COULD BEGIN AS EARLY AS JULY 1987. THE QUANTITY OF NEW MATERIAL IS ESTIMATED AT 23.6M CY. SOME MAINTENANCE MATERIAL MAY ALSO BE PLACED IN THE BERM.

SLIDE 26 PHASE I OF THE PROJECT CONSISTS OF DEEPENING THE EXISTING CHANNEL FROM 40 To 45 FT THROUGH THE BAY AND DEEPENING OF THE BAR CHANNEL FROM 42 TO 47 FT, A TOTAL DISTANCE OF 36 MILES.

SLIDE 27 THE BERM WILL BE LOCATED IN 40 FT OF WATER AT THE EXTREME EASTERN LIMITS OF THE EPA DESIGNATED DISPOSAL AREA. THE COMPLETED BERM WILL BE APPROXIMATELY 20 FT IN HEIGHT AND HAVE SIDE SLOPES ESTIMATED TO BE ABOUT 1 ON 100. IT WILL BE ABOUT 1 MILE WIDE AND 2-1/2 MILES LONG. THIS WILL BE THE LARGEST UNDERWATER FEATURE EVER CONSTRUCTED.

SLIDE 28 IN ORDER TO VERIFY THE BERM CONCEPT, IT IS NECESSARY TO CONDUCT APPROPRIATE MONITORING.

SLIDE 29 THE MONITORING IS A JOINT EFFORT BETWEEN THE MOBILE DISTRICT AND THE COASTAL ENGINEERING RESEARCH CENTER. MONITORING OF BASE LINE CONDITIONS FOR THE FEEDER BERM WAS INITIATED IN DEC. 86 AND MONITORING WILL CONTINUE THROUGH DEC. 87. BASE LINE DATA COLLECTION FOR THE STABLE BERM WILL BE INITIATED IN MAY AND WILL CONTINUE THROUGH FY 90. MONITORING IS BEING CONDUCTED FOR THE ENTIRE FEEDER BERM. ONLY A TYPICAL SECTION OF THE STABLE BERM WILL BE MONITORED DUE TO ITS LARGER SIZE AND LENGTHY CONSTRUCTION PERIOD.

SLIDE 30 THE MONITORING TECHNIQUES WILL APPLY, IN GENERAL, TO BOTH THE FEEDER AND STABLE BERMS. IN THE CASE OF THE FEEDER BERM,

WE EXPECT THE MATERIAL TO MOVE DOWNDRIFT AND HOPEFULLY CONTRIBUTE TO A REDUCTION IN SHORELINE EROSION. IN THE CASE OF THE STABLE BERM, THE MONITORING PROGRAM WILL INDICATE WHETHER IT REMAINS IN PLACE, CONTRIBUTES TO WAVE ENERGY DISSIPATION, AND PROVIDES AN IMPROVED MARINE HABITAT.

SLIDE 31 WE ARE USING A VARIETY OF MONITORING TECHNIQUES TO DOCUMENT BEHAVIOR OF THE BERMS. FATHOMETER SURVEYS ARE BEING USED TO MEASURE BERM ELEVATIONS AND SIDE SCAN SONAR WILL BE USED TO HELP DEFINE BOUNDARIES OF THE BERMS. THE SURVEYS OF THE FEEDER BERM THUS FAR SHOW THAT THE PLANNED CONFIGURATION WAS ACHIEVED AND THAT THE MATERIAL IS BEGINNING TO MOVE AS ANTICIPATED.

SLIDE 32 THE MONITORING PROGRAMS INCLUDE COLLECTION OF SURFACE SEDIMENT SAMPLES IN ORDER TO TRACK SEDIMENT MOVEMENT THROUGH GRAIN-SIZE ANALYSIS. AT THE STABLE BERM, WE WILL ALSO BE TAKING DIVER CORE SAMPLES TO ASSESS CONSOLIDATION AND SPREAD OF THE MATERIAL.

SLIDE 33 WE WILL BE MEASURING THE PHYSICAL FORCES SUCH AS WAVES AND CURRENTS THAT ACT ON THE BERMS. BOTTOM CURRENTS WILL BE TRACKED USING SEA BED DRIFTERS THAT FOLLOW THE MOVEMENT OF LOCAL CURRENTS. WE WILL USE SEVERAL INSTRUMENTS TO MEASURE WAVE CLIMATE IN THE VICINITY OF THE BERMS, SINCE WAVES ARE THE PRINCIPAL DRIVING FORCE BEHIND SEDIMENT MOVEMENT IN THE COASTAL ZONE.

SLIDE 34 WE WILL BE USING BOTH AERIAL PHOTOGRAPHY AND SATELLITE IMAGERY TO MEASURE ANY LARGE SCALE MOVEMENT OF THE FEEDER BERM CAUSED BY STORMS AND TO DETECT TURBIDITY PLUMES THAT MAY DEVELOP FROM EITHER BERM.

SLIDE 35 FINALLY, WE WILL BE EVALUATING THE EFFECTS OF THE STABLE BERM

ON FISHERIES BY CONDUCTING DIVER INVENTORIES OF KEY FISH SPECIES. TRAWLING WILL BE CONDUCTED TO INVENTORY JUVENILES OF THESE SPECIES.

SLIDE 36 KNOWLEDGE GAINED THROUGH THE NATIONAL DEMONSTRATION WILL BE TRANSFERRED TO OTHER DREDGING PROJECTS THROUGH THE NEW DREDGING RESEARCH PROGRAM TO BE INITIATED IN FY 88.

SLIDE 37 IN SUMMARY, AS WITH ANY BENEFICIAL USE CONCEPT, DREDGED MATERIAL FOR BERM CONSTRUCTION SHOULD BE CONSIDERED A RESOURCE RATHER THAN A WASTE PRODUCT. THE DEMONSTRATION PROJECT HAS BEEN FULLY COORDINATED WITH ALL INTERESTED PARTIES. THE POTENTIAL BENEFITS INCLUDE DECREASED DREDGING COSTS, DECREASED SHORELINE EROSION, AND AN ENHANCED FISHERY HABITAT. IN ADDITION, THE RESULTS FROM THE NATIONAL DEMONSTRATION AT MOBILE CAN BE APPLIED TO OTHER NAVIGATION PROJECTS ACROSS THE NATION.

650' – 1.5 Nautical Miles

45x400 – 23 N Miles

– 7.1 Nautical Miles

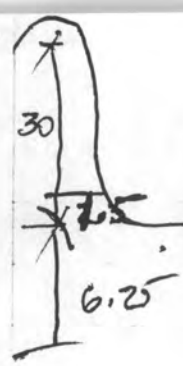
1600 + 40

112 + 50

1.7

28.2 BAY

– 8



23.5

Inner Bar – 1.5 miles
Outer Bar – 6.25 miles

12
11½

–2
Inner Bar

5 Outer

X 1.26

469,... VEY

268,435
used density –

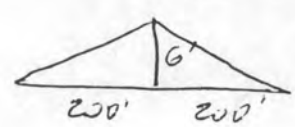
HAUL
(BIN)

DISPOSAL BEGAN – 6 JAN 87
DISPOSAL ENDED 24 Feb 87

AFTER SURVEY OF BERM 2-5 March 87

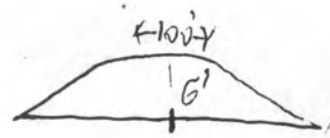
(very preliminary)
FEEDER ABOUT 5,500' long
AVG WIDTH ≈ 400', up to 500-600'
DISPOSAL IN 18-19' water
Relief ≃ 6' Avg
Ranged from 4' to (8-9')

Slope



6) 200 = 33

≈ 1/30



6) 150 = 25

≈ 1/25

New technique combats beach erosion

by David Reilly

In the constant war against beach erosion, the Corps is using a new experimental approach designed to let nature itself do most of the work.

About 1,200 feet off Gilgo Beach on Long Island, the Corps is constructing an undersea berm, in essence a large sandbar, which will hopefully protect and possibly naturally feed the badly ravaged beach there.

First tried in Mobile District two years ago, this is the first time the undersea berm concept is being constructed with exact placement in the New York District.

By creating the six-foot-high mound in shallow water, the berm is designed to protect the beach. This mound will absorb the energy of waves, reducing their impact on the beach, possibly slowing erosion.

The beach could also be naturally replenished or fed by the berm, if sand from it drifts ashore.

The construction of the 11,000-foot-long, 500-foot-wide berm is a two-prong project taking place in Fire Island inlet. Besides trying a new way to slow beach erosion, the project also uses maintenance dredging to build the berm.

The first phase of the project is the maintenance dredging of a secondary channel in Fire Island inlet. The second part is the construction of the berm using the material from the dredge.

Often, a contractor will take the material from a dredge and dump it at sea. In this project, however, sand is dumped in a specific site off Gilgo Beach. Since it is cheaper for the contractor to dump the sand by the area being dredged, the project is cost-effective.

In addition, the sand is being dumped in an exact location. "The dumping is carefully orchestrated," said Gilbert Nersesian, the District's coastal engineer from the Design Branch of Engineering. He added that the "controlled placement" is being done by electronic positioning.

Because material has never been so carefully placed before, it is not know what affect it will have. Members of the Operations Division will be doing intense monitoring of the project over the next year, said Phil Flax, a geologist in the Water Quality Compliance Branch of Operations.

This monitoring will include twice weekly bathometric studies, profiles of the dispersal area at 100 foot intervals, aerial photography, and sediment samples from the beach and berm.

"We will try to determine what, if any, effects the establishment of the berm has had on the beach," Flax said. "We will try to see if it has protected it, fed it, or destroyed it."

It is doubtful, though, that the project will harm the beach. Bill Slezak, chief of the Navigation Branch in operations, said the berm isn't known to have any negative effects.

In any case, Gilgo Beach couldn't get much worse. Erosion has reached the back areas of the dunes, leaving a small amount of dune between the sea and Ocean Parkway. The town of Babylon has constructed a fence along the road to keep people off the dunes, and "Severe Beach Erosion Area" signs dot the area.

There has not been sand placement at feeder beaches by Gilgo for a few years and other methods, such as groins, have never been used there. Although Nersesian said direct placement is the most effective method, he added that it is also the most costly. The berm, then, while not as effective is much cheaper.

While members of Operations are careful not to count their chickens before they're hatched, they hope the berm will work as planned.

When used in Mobile District, the berm "did exactly what it was supposed to," Flax said. But he adds that the sediment flows and other factors there were known. This is not the case off Gilgo.

And even with the intense monitoring operation, Flax admits it's an experiment and that at this point "We haven't got the faintest idea of what it's going to do."

What it is hoped to do, Flax said, is reduce wave energy and feed the beach. The mound causes the bottom of a wave to drag when it moves across it, causing the wave's top to crest and spill early. The friction caused by the berm reduces the wave's energy.

Besides doing this, the berm is intended to feed the beach. Flax and another geologist from the Water Quality Compliance Section, Mike Fedosh, have no doubt that some of the berm is going to move. But the question is where.

In the best scenario, the sand will be taken ashore by the waves and the berm will naturally feed the beach. It could, however, move offshore or laterally. But Slezak said neither of these possibilities would have negative effects. Movement offshore would reduce the slope of the ocean floor and lateral movement would possibly feed other areas, he said.

Nersesian said there has been some return of sand to the beach, but it is not known how much will move ashore.

Both the Corps and residents of Gilgo Beach are hoping that the berm will effectively slow the erosion and replenish the beach. Residents are helping with the monitoring process by serving as Littoral Environmental Observers, LEO's.

These residents of Gilgo and West Gilgo Beaches make visual observations of wave periods, types of waves, direction, plunging and spilling of the waves and wind speed. They also use flourescent dry packs to measure the direction the sediment will travel.

The residents, Flax said, are eager to help because if the beach erodes further, the ocean, in a storm, could breach the Parkway and destroy the houses.

He added that slowing the erosion is also important for the Southern shore of Long Island. "This island is the mainline of protection for the Southern Shore," he said. "So partially the replenishment is for recreation, but it's mostly because those beaches are the barriers, the main line of protection for 800,000 people."

The berm, while it will hopefully prove effective, is only a temporary sure, Nersesian said. "Eventually, the underwater mound is going to revert back to its natural condition," he said. "The pile of sand will be re-worked by littoral forces," such as waves, winds and currents.

The hull of the Northerly Island (l.) splits down the middle and the sand is washed out during the dumping operation.