CHAPTER 14

MULTIPURPOSE USES AND OTHER LAND USE CONCEPTS

14-1. General. With careful engineering design, construction, long-term coordination and planning, and proper implementation of operational and maintenance procedures, a disposal site having combinations of uses may be developed. This multipurpose use of disposal sites is strongly encouraged. A park and recreational development built over an existing solid waste landfill using dredged material as a cap is an example of how several of the beneficial uses discussed in the preceding sections can be lumped into a multipurpose project. There are a number of actual and planned examples of multipurpose sites. Often, multipurpose objectives do not involve substantial cost increases to the dredging project when plans are made in the initial phases of design and construction. Frequently, recreational use and wildlife and fish habitat can be developed simultaneously on a disposal site. Potential problems with development of multipurpose projects are usually related to conflicting user groups of the proposed disposal/development site. Careful selection of compatible potential users can avoid situations where the projected uses conflict.

14-2. Case Studies.

a. One example which demonstrates what can be accomplished when poor-grade dredged material is placed in conjunction with higher quality material to produce a multipurpose site is Aquatic Park in Toronto, Ontario, Canada. Along the shoreline, numerous commercial, transportation, and recreational sites have been created by the combined use of landfill and dredged material. Aquatic Park, under development by the Toronto Harbour Commissioners, is an excellent example of how the form of the land created can enhance the number and quality of productive uses. Construction rubble was used to create an approximately 3-mile-long headland running at an oblique angle to the natural shoreline. The headland is essentially linear but has numerous indentations in its shoreline dike. Dredged material was placed in the water behind the rubble dike where protection is afforded from wave and tidal action and associated erosion. The dredged material was placed to form contours for the development of lagoons and lakes along and behind the shoreline. The resultant configuration of the headland resembles natural landforms in the area. The length of shoreline- is many times the length that would have resulted from
a conventionally shaped disposal area; thus, opportunity for shoreline utilization has been increased. Figure 14-1 shows Aquatic Park during dredged material placement in early stages of development.

b. Another very interesting and highly successful case study is Pointe Mouillee in western Lake Erie, Michigan (item 42) (Figure 14-2). Pointe Mouillee has been under development by the Detroit District for over 10 years. All engineering operations on the island portion and dikes were completed in 1983. The marsh phase of site development, including construction of

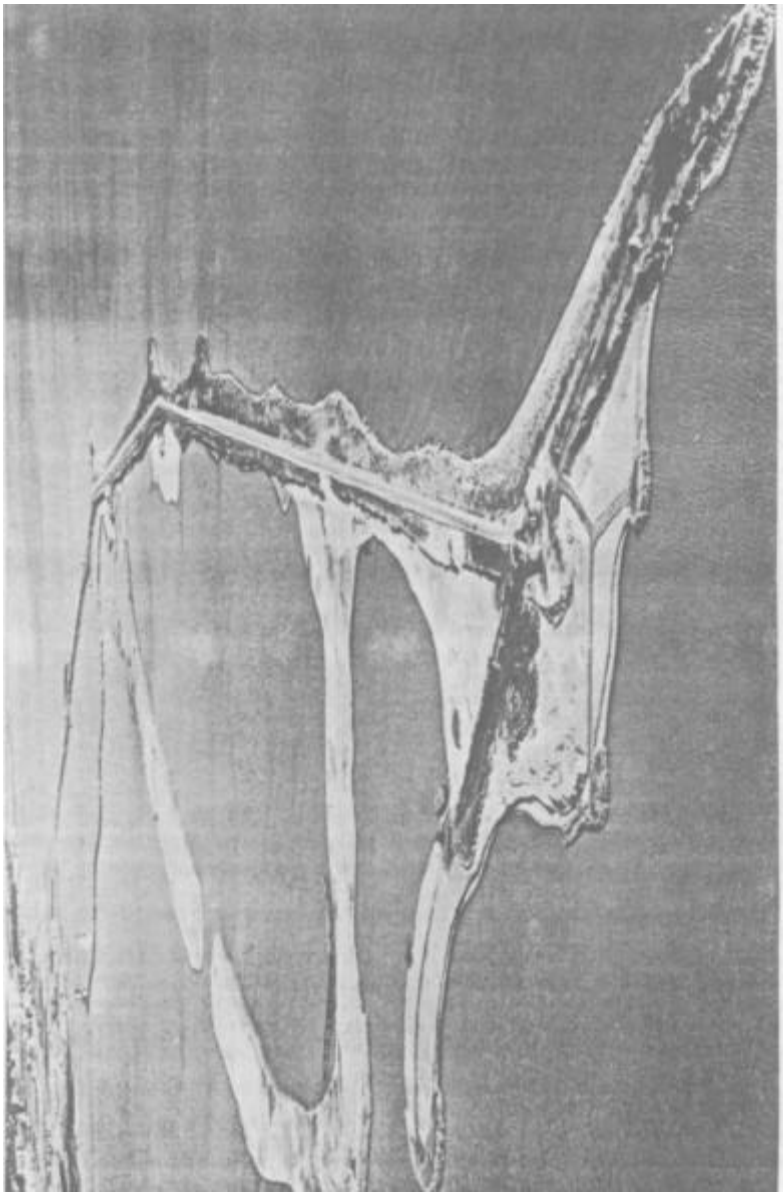

Figure 14-1. Dredged material placement at Aquatic Park, Toronto, Ontario, Canada

Figure 14-2. Pointe Mouillee, in western Lake Erie, is a CDF for contaminated dredged material that also serves as a multipurpose beneficial use site

freshwater marshes, marinas, visitor center, public walks and areas, and fishing facilities, has just begun. The existing marsh inside the installed floodgates is progressing naturally, nourished by sediments trapped by channeling part of the Rouge and Detroit Rivers through the marsh. The nesting islands built of dredged material are covered with tall vegetation, and the fringes are being used by nesting waterfowl. Portions of the shoreline have been planted in grain fields for wildlife. Many of the barrier island dike compartments have been filled with dredged material to capacity, and they are colonizing naturally with locally occurring plant species. The island is scheduled to be planted with perennial grasses and forbs to create nesting and grazing meadows. Capping the dredged material with clean soil is also being considered (item 42). The dikes of the island have had waterbird use for loafing and feeding since construction began, primarily by gull species. This follows the expected pattern for construction in Lake Erie noted in the 1970s in which virtually every new dredged material site was colonized by nesting seabirds if the site consisted of suitable habitat (item 73). A management plan for the site was drafted in 1980-81 and is being followed carefully. This site is only one of two in the United States in which a CE District has applied and received permission to use Section 150 funds of the Water Resources Development Act (P.L. 94-587) for wetlands development, and up to $400,000 per dredging project has been earmarked for habitat development of Pointe Mouillee (item 59). This site is multipurpose, providing wetlands, upland, island, and aquatic habitat development; fishing, hunting, boating, recreation; ice fishing; nature trails; marina; visitor center; bird watching; and jogging and hiking.

c. A third example of a multipurpose disposal site is being developed in Coss Bay, Oregon, where a large containment site with eight compartments and extensive cross dikes is being filled and dewatered incrementally. The site will ultimately be developed for port, industrial, residential, and urban uses by the local sponsor, and parts of the site are scheduled for agricultural crops (Figure 14-3).

d. Some of the beneficial use examples given in other chapters of this EM that have actual multipurpose use include Gaillard Island at Mobile, Alabama; the aquaculture project at Freeport, Texas; all of the examples in Chapters 11 and 15; and a number of island habitat development sites where recreation and boating are also prime uses.

14-3. Other Land Use Concepts. Dredged material beneficial uses described and discussed in this EM are all highly productive, environmentally and economically acceptable alternatives to standard disposal practices. Dredged material has been shown in numerous cases to be a valuable resource with comparable properties of any saturated (or dewatered) soil. A few uses that may be considered beneficial did not merit separate chapters, but will be discussed here for completeness of this manual.

a. Erosion Gully Fill. Large quantities of dredged material could be disposed of within the numerous gullies formed from poor soil conservation

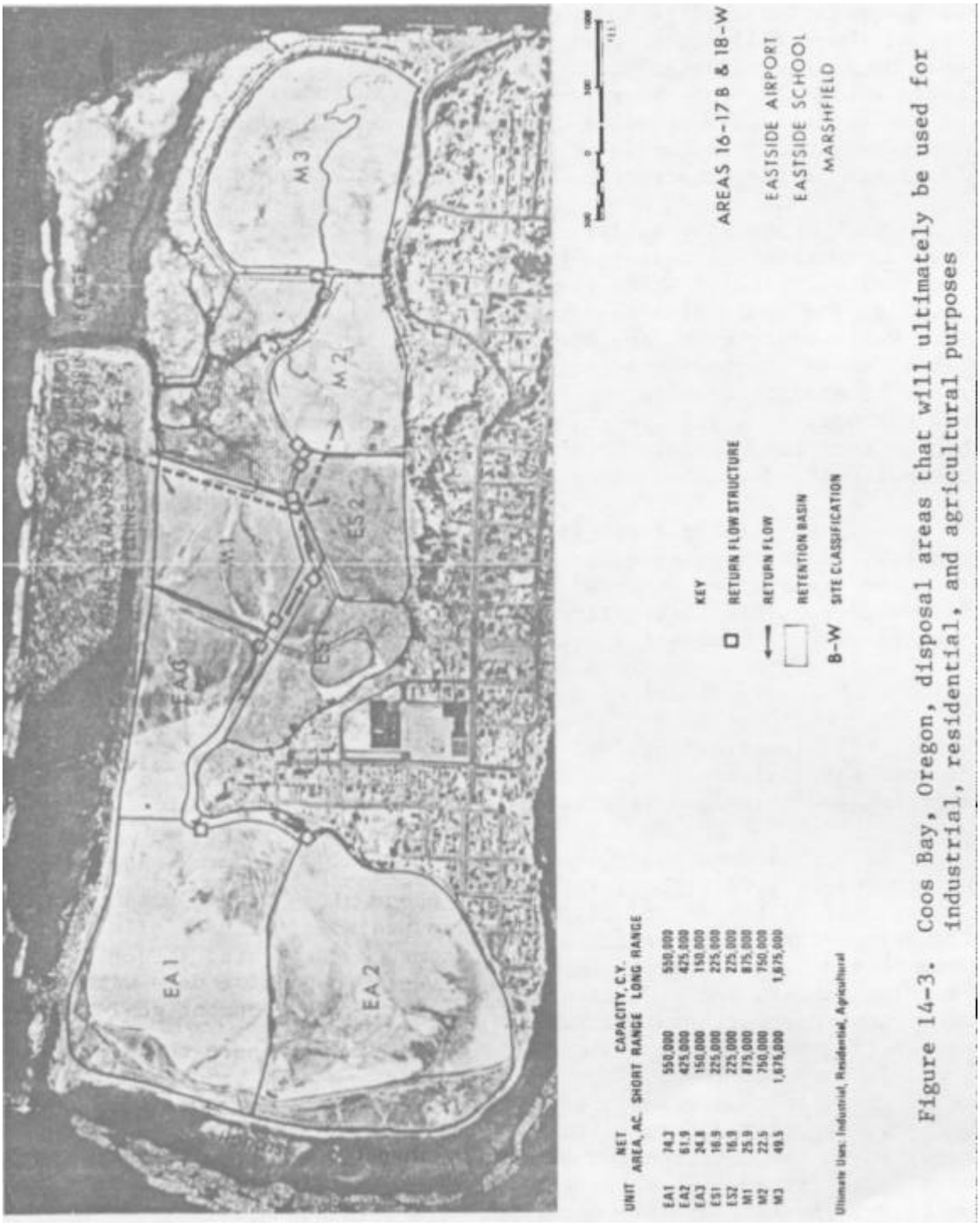

Figure 14-3. Coos Bay, Oregon, disposal areas that will ultimately be used for industrial, residential, and agricultural purposes

practices in both rural agricultural and urban construction areas. Such gullies are unsightly and unproductive and, generally, attempts to cover them with vegetation such as kudzu, rather than to reclaim them, are made. Since few of these hill sites occur within reach of hydraulically pumped material, only dewatered and transported material could be used. Transport and handling costs would make this an expensive alternative that probably will find little if any economically feasible justification. An example where this beneficial use was actually accomplished is the gully fill done by Mobile and Nashville Districts in the construction of the Tennessee-Tombigbee Waterway.

b. Topography Relief. Another means of using large quantities of dredged material is building hills for landscape diversity on large, level recreational sites. While this also usually would apply only to dewatered material and would also be costly, it has been considered in planning by the Fort Worth District in the special case of new work dredging in the Trinity River due to the huge quantities of material to be moved. It is being practiced in modification in the Red River Navigation Project in Louisiana, where new cut work is being used to build up island sites in the river to a level higher than the floodplain for recreation. These Red River sites employ hydraulically deposited material.

c. Earthen or Earth-filled Dams. In areas where reservoirs for flood control, recreation, or other purposes are planned, dewatered dredged material could be transported and used for construction of either earthen or earth-filled dams. This alternative would only be feasible in locales where other sources of borrow material are more costly or unavailable.

d. Institutional Use.

(1) Institutional use includes all public service/municipal uses of dredged material containment areas such as electric utilities, transportation systems, and water and wastewater facilities.

(2) One case study is Pleasure Island, bordering the Intracoastal Waterway near Port Arthur, Texas, a 3,500-acre land area formed from over 50 years of silt and sand disposal. A rock dike protects a small portion of the island that is presently developed. Among the diverse facilities developed thereon are a university campus (Lamar University), an Army Reserve Training Center, and a CE Area Office. Two recently constructed rock dikes will encourage further institutional facilities including an already planned sewage treatment plant.

(3) Another example is in Salem County, New Jersey, where a 1967 land exchange negotiated between the CE and the local public utility company has resulted in the construction of a nuclear power plant on a 200-acre disposal site. The first of four units commenced operation in 1976; the remaining units were on-line by 1979 and 1980. The site was originally a sandbar upon which fine-grained material from Delaware River dredging over the past

70 years had been placed to form a peninsula; it is now called Artificial Island.