

New Bedford Harbor
B.V.
60048

9/20/95 New Bedford Harbor Superfund Forum Meeting
Other Miscellaneous ROD II Issues

1. How much heavy metals will leak from the CDFs?

In the estimate of PCB leakage from CDFs that was discussed at the previous Forum meetings, a similar estimate of the amount of copper leakage was made. Copper was singled out for this analysis because it was one of the metals of most concern based on earlier leaching experiments. You will recall that the PCB leakage estimate was divided into both long term estimates (0.008 pounds per day) and short term estimates (0.36 pounds per day). The estimates of copper leakage were much less than these PCB rates. The long term estimate was 0.0002 pounds of copper per day, and the short term estimate was 0.01 pounds per day (for the first 2 - 3 years after disposal).

2. How long will it take for the dredged sediments to settle or consolidate to a stable level?

The attached Figure D1 from the Corps of Engineers Feasibility Study (Report 11) indicates that dredged material in general should reach its most compact or consolidated level at about 3 to 5 years after disposal. The two different lines on this graph show the limited difference between settlement at a CDF with a sandy foundation verses one with a clayey foundation.

3. What other sites around the country have used CDFs?

In addition to material distributed previously about other CDF sites, two documents are attached from the Commencement Bay (Washington state) Superfund site, which describe various activities associated with the Sitcum waterway remediation project. The first is a fact sheet from November 1992 which discusses preferred cleanup plans for the waterway, and the second is a short letter report which includes a figure of the monitoring well network around the perimeter of the CDF facility. The Sitcum waterway project shares some important features with the New Bedford harbor project in that ~~maximum sediment PCB levels are about the same (4000 ppb) and in that~~ the CDF is slated for commercial maritime use when completed.

DAD
9/20/95

4. What are the exact layouts of the proposed CDF facilities?

Three maps are attached which show the conceptual footprint of CDFs 1, 1B and 7. The map for CDF 1 also shows the layouts of CDFs 1A and 3, but please note that these two CDFs would NOT be required if CDFs 1, 1B and 7 are used as proposed.

5. **Different potential CDF locations:** the last map attached shows ALL of the CDFs that were deemed worthy of consideration for the final remedy, along with the disposal volumes afforded by each one. Again, please note that only three of these potential CDFs (1, 1B and 7) would be required for the proposed remedy.

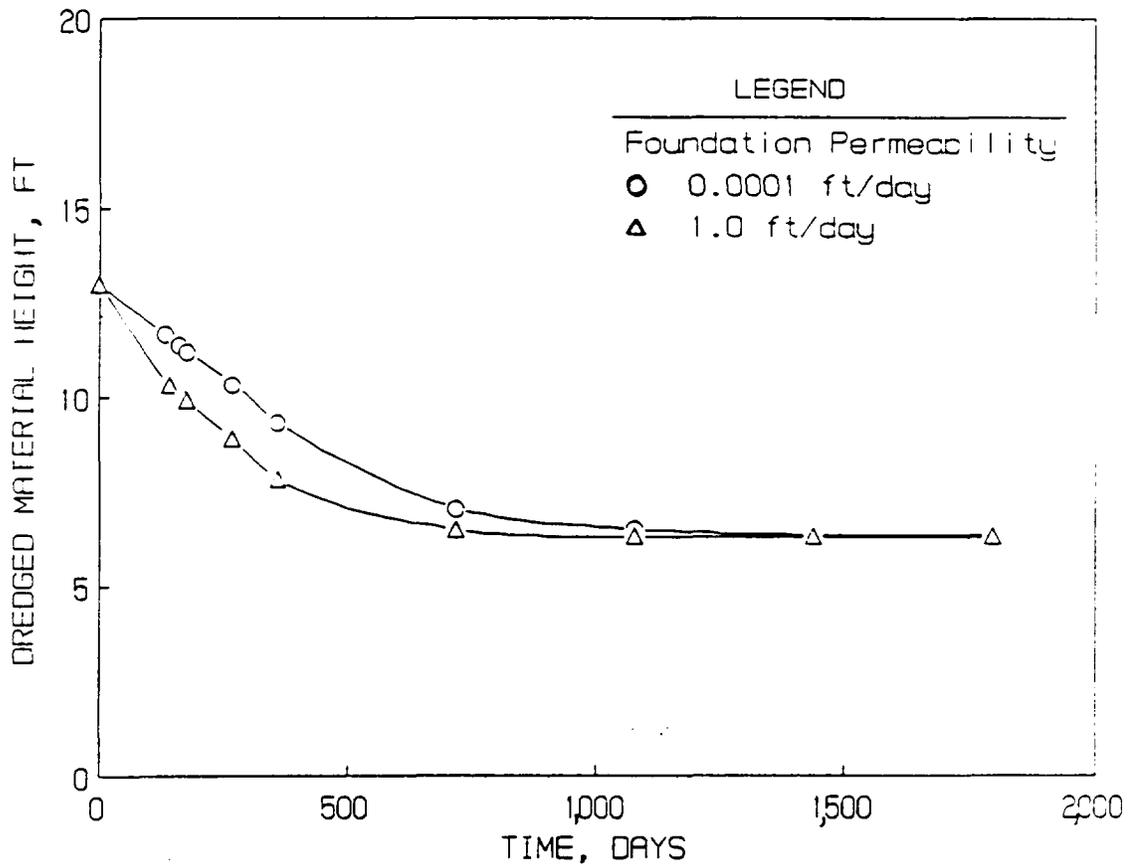


Figure D1. Consolidation rate for Upper Estuary dredged material



November 30, 1992

Superfund Fact Sheet

Commencement Bay Nearshore/Tideflats Superfund Site Sitcum Waterway, Tacoma, Washington

EPA Seeks Public Comment On Conditional Approval Of Sitcum Waterway Cleanup

The U.S. Environmental Protection Agency (EPA) has evaluated and conditionally approved the Port of Tacoma's (Port) evaluation of cleanup approaches for contaminated sediments in the Sitcum Waterway. The Sitcum Waterway is one of eight problem areas within the Commencement Bay Nearshore Tideflats (CB/NT) Superfund site requiring cleanup, as shown on Figure 1. The sediments in Sitcum Waterway are contaminated with a number of chemicals which are associated with adverse biological effects.

The Port's cleanup plan recommends combining:

- ◆ sediment cleanup and navigation maintenance dredging in Sitcum Waterway;
- ◆ dredging of contaminated and clean sediments from Blair Waterway for navigation maintenance, for sediment cleanup and for compliance with the Puyallup Tribe of Indians Land Settlement Act of 1989;
- ◆ disposal of contaminated sediments from both Sitcum and Blair Waterways in the Milwaukee Waterway which will be used for marine terminal expansion; and,
- ◆ disposal of clean sediments from Blair Waterway in Milwaukee Waterway as either fill or cap material, and in open water per the U.S. Army Corps of Engineers (COE) requirements of the Puget Sound Dredge Disposal Analysis (PSDDA).

EPA's conditional approval of the Port's cleanup plans is contingent on the following:

- ◆ consideration of public comment;
- ◆ compliance with the Clean Water Act requirements and other requirements under Federal, State and local law;
- ◆ EPA approval of plans that will compensate for the plant and animal environments lost from the filling of the Milwaukee Waterway, or "compensatory mitigation plans";
- ◆ EPA approval of cleanup design plans; and,
- ◆ satisfactory negotiation of a federal consent decree between EPA and the Port.

Public Comment Period

EPA is seeking public comment on its conditional approval of this project from **December 1, 1992 through January 29, 1993**. EPA typically holds 30-day public comment periods for cleanup proposals under Superfund, but has decided to provide an extended period of 60-days for this proposal based on public interest. Public comments should be mailed to:

Margaret Justus, Project Manager
1200 Sixth Avenue, HW-113
Seattle WA 98101

You are invited to a general public informational meeting and/or a technical discussion session to learn more about this project on the following dates:

Technical Discussion Session
December 15, 1992, 7:00 p.m.

General Public Informational Meeting
January 12, 1993, 7:00 p.m.

In addition, the Port will sponsor an additional technical discussion session on December 18, 1992 at 1:30 p.m.

All of these meetings will be held at the World Trade Center, 3600 Port of Tacoma Road, Tacoma, Washington.

The section titled "Conditional Approval Process" on page 6 of this fact sheet describes the key areas of this project that EPA is seeking public comment.

Background

Commencement Bay Nearshore/Tideflats Superfund Site

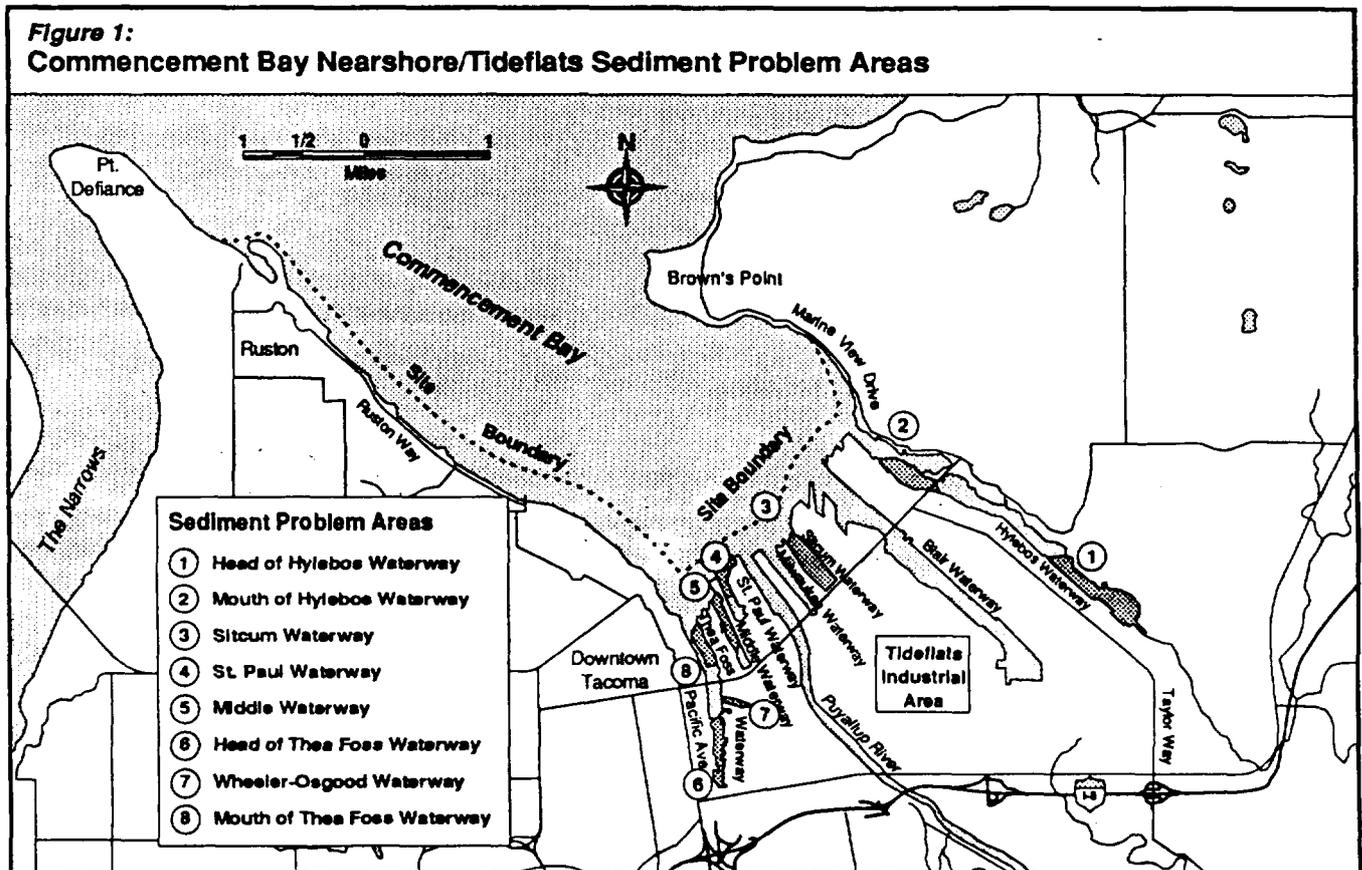
In 1983, EPA placed the Commencement Bay Nearshore/Tideflats site on the National Priorities List (NPL) of sites requiring investigation and cleanup under EPA's Superfund authorities.

In September 1989, after taking public comment, EPA developed a cleanup plan for Commencement Bay called the "Record of Decision" or "ROD". The ROD identifies eight problem areas in Commencement Bay, including Sitcum Waterway, that require cleanup under Superfund. The cleanup goal for the Commencement Bay problem areas is to achieve sediment quality in the bay that will support a healthy marine environment and will reduce the risk of eating contaminated seafood from the bay. The goal is established to allow a diverse range of uses in the bay including industry, business, navigation, fisheries, and recreation.

The ROD outlines a two-phased cleanup approach for the Commencement Bay problem areas, source control followed by sediment cleanup. EPA is the lead agency for sediment cleanup and Washington Department of Ecology is the lead for source control. Once adequate progress has been made on source control in a particular problem area, sediment cleanup can begin.

EPA selected four sediment containment technologies in the ROD that can be used for sediment cleanup. These are:

- 1) in-place capping,
- 2) dredging and confined aquatic disposal,
- 3) dredging and nearshore disposal,
- 4) dredging and upland disposal.



EPA's sediment cleanup plans, which may include containment options and natural recovery, are to be identified during the design phase for each of the eight problem areas.

The availability of locations for sediment containment is limited within Commencement Bay. In addition, EPA, the COE, and the resource agencies (for example, the U.S. Fish and Wildlife Service) are concerned that impacts to valuable animal and plant environments be minimized in the Commencement Bay. Therefore, the ROD expressed a preference that the nearshore disposal option be used only in conjunction with fill projects that would otherwise be permitted for commercial development. The ROD's intent was to minimize physical impact to the nearshore environment by avoiding filling nearshore areas solely for the purpose of sediment disposal.

Sitcum Waterway Problem Area

The Sitcum Waterway is located between the Blair Waterway to the northeast and Milwaukee Waterway to the southwest. It is a deep navigational waterway, created by dredging and filling native mudflats since about 1910. Sitcum was generally completed in its present configuration during the 1970s for the purpose of creating marine industrial and terminal space. The navigational channel of the waterway is approximately 3,000 feet long and 750 feet wide from bank to bank. The dredge channel maintained between the faces of the piers is approximately 480 feet wide.

Land directly adjacent to Sitcum Waterway is owned by the Port of Tacoma. However, some land near the mouth of Sitcum is owned by the Washington State Department of Natural Resources. The south shore is used as a marine terminal facility by Sea-Land, a tenant of the Port. Terminal 7 occupies the northeasterly waterfront, with facilities for container handling and bulk unloading of alumina. Historically, lead, copper, and zinc ores were handled as well. Other properties associated with Sitcum contamination are connected to the Sitcum Waterway by a large stormwater drain that discharges runoff from a large, industrial and commercial area covering approximately 170 acres.

Investigations have shown the Sitcum Waterway sediment problem area to be contaminated with metals such as arsenic, cadmium, copper, lead, nickel and zinc, and polyaromatic hydrocarbons (PAHs) above the cleanup levels (or sediment quality objectives) identified in the EPA cleanup plan, or ROD. In general, the highest concentrations of these contaminants are found near a storm drain outfall in the southeasterly corner and near the ore loading facility on the northeast embankment.

1991 Administrative Order on Consent

An Administrative Order on Consent (Order) between EPA and the Port of Tacoma became effective on March 29, 1991. Under the Order the Port agreed to evaluate the four sediment cleanup options contained in the ROD for their applicability to the Sitcum Waterway problem area and to reimburse EPA for oversight costs. The ROD identifies several factors to be considered in the evaluation of the disposal/cleanup options including: the status of controlling sources of pollution from draining into the waterway, the control of potential environmental impacts, the availability of disposal sites, the improvement of benefits to animals and plants, cost effectiveness, and economic development.

The Order between the Port and EPA was prompted by two factors. First, the Port's development plans called for maintenance dredging in Sitcum and Blair Waterways for navigation, and a proposed nearshore fill project in Milwaukee Waterway for marine terminal expansion. Second, EPA recommended that the Port consider its proposed Milwaukee Waterway Fill Project as a potential disposal site for contaminated Sitcum sediments because disposal sites in the CB/NT site are limited.

The Order was designed to meet the requirements of the ROD and the Clean Water Act (CWA) requirements for development projects. The Order required evaluation of the ROD sediment disposal/cleanup options, with an emphasis on the evaluation and preliminary design of the Port's proposed commercial fill project in Milwaukee Waterway as a nearshore disposal option.

Working under the requirements of the Order, the Port has prepared an "Evaluation Report" which is subject to public comment and is entitled:

"Sitcum Waterway Remediation Project, Phase 1 Pre-Remedial Design Evaluation and Phase 2 Preliminary Evaluation of Remedial Options Report, Port of Tacoma, Washington", Volumes 1, 2, and 3, September 30 1992.

In the Evaluation Report, each cleanup option was analyzed for consistency with the ROD and for compliance with environmental requirements under federal and state laws. The Evaluation Report and supporting documents are available at the information repositories listed at the end of this fact sheet.

Evaluation of the Disposal/Cleanup Options

The Port's evaluation of the disposal/cleanup options focuses on the nearshore disposal option, as directed by EPA. This option would use the planned Milwaukee Waterway Fill Project as a multipurpose disposal and development site. The site would contain sediments dredged from the Blair and Sitcum Waterways to meet cleanup and navigational needs, Mud Lake sediments and possibly sediments from portions of the Lincoln Avenue Ditch. The Port proposes to use the Milwaukee Fill site to expand the existing Sea-Land marine container terminal facility.

EPA directed the Port to evaluate the nearshore fill option according to both the ROD and the Clean Water Act (CWA) by assessing preliminary information on the option. The evaluation included consideration of: potential surface water impacts, engineering plans for the dredge and fill project, the extent of contamination in the Sitcum Waterway, and marine plant and animal impacts from filling of the Milwaukee Waterway.

EPA also directed the Port to provide information on other potentially viable sites for disposal of Sitcum contaminated sediments according to the ROD disposal/cleanup options. The evaluation screened out disposal options that were clearly inappropriate due to physical and environmental parameters such as size or stability.

Three disposal sites were evaluated including the Milwaukee nearshore site, an upland landfill site, and a confined aquatic disposal site (CAD). Based on the evaluation, EPA concluded that natural recovery is not a viable option for the entire Sitcum Waterway cleanup. EPA also concluded that while the CAD and upland sites are potentially viable sites, conditional approval of the nearshore option is appropriate because of the reasons listed in the next section titled, "Conditional Approval Process."

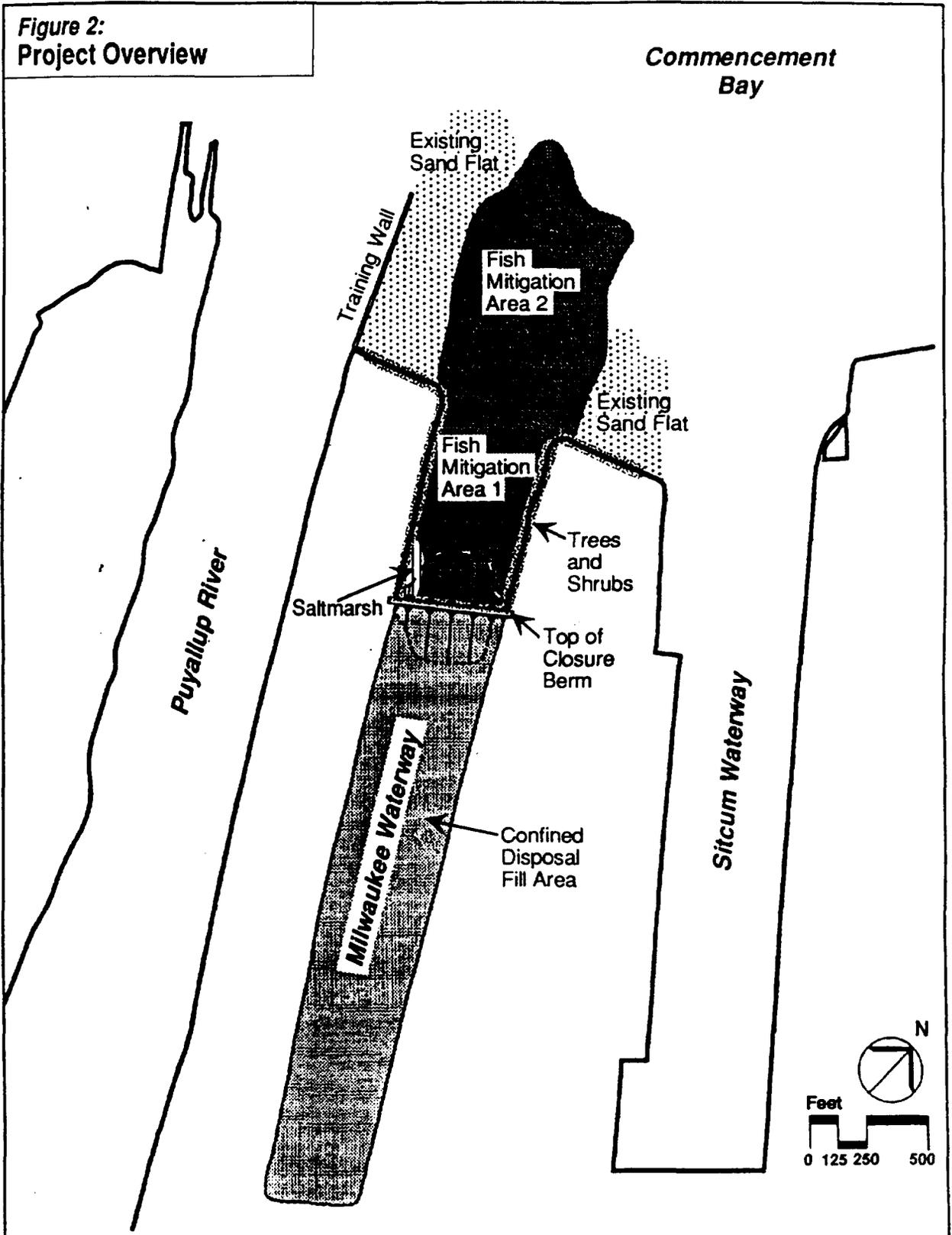
Under the Order, screening and review criteria were identified that were appropriate to the circumstances particular to this evaluation. However, these criteria may not be applicable in evaluating options for other sediment problem areas in Commencement Bay or other Superfund sites. For instance, in this case, EPA allowed the Port to screen out the use of multiple disposal sites because the Port identified several sites large enough to contain all of the Sitcum sediments. Disposal costs are reduced by using one site rather than multiple sites. However, for other Commencement Bay problem areas, it may be appropriate to use multiple disposal sites.

Project Plans

The nearshore disposal project is located on Figure 2. As shown, there would be a "closure berm" constructed across the Milwaukee waterway to form the outer structure of the containment area for the fill project. The closure berm would be constructed with clean sediments dredged from the Blair Waterway.

Contaminated sediments from Blair Waterway, Mud Lake, Lincoln Ditch and Sitcum Waterway would then be placed behind the berm and at the bottom of the Milwaukee Waterway. They would be placed at the bottom in order to minimize potential movement of contaminants.

Clean sediments from the Blair Waterway would be used to cap the contaminated Blair, Mud Lake, Sitcum sediments and possibly Lincoln Avenue Ditch sediments. The cap would have an average thickness of 7 feet or greater. The final surface would be created by adding an additional 3-foot cap over the Milwaukee fill. Clean Blair sediments



Project Plans (continued)

for the habitat mitigation area would be placed in front of the closure berm and then covered with materials such as gravels and cobbles.

EPA will ensure that the above measures are done in a protective manner by using best engineering controls, setting standards, and monitoring the activities. EPA approval of these measures will occur as EPA reviews the Port's proposed Remedial Design workplans. The Port, with EPA oversight, will be responsible for long-term maintenance of the disposal site in order to ensure long term protectiveness of human health and the environment.

Conditional Approval Process

EPA approval is specifically contingent upon the following five conditions:

Condition #1. Consideration of public comment with regard to this project.

Public review will be an important component of EPA's final review and approval of the project. There are three areas in which EPA specifically seeks public comments:

- ◆ Would the proposed project achieve an appropriate balance between environmental cleanup, potential environmental impacts, compensatory mitigation and development?
- ◆ Are there any particular concerns relative to project design, operation and maintenance, and monitoring plans and contingency planning that can be addressed by EPA and the Port in the next phases of the project?
- ◆ Is this evaluation, public comment and decision process appropriate for other problem areas in Commencement Bay?

Condition #2. Determination of compliance with the Clean Water Act (CWA) requirements.

The CWA requires that proposed nearshore fill projects meet all criteria of Section 404 (b)(1) including water quality criteria and standards.

The COE typically conducts the review of a project for authorization under Section 404. The Corps first holds a public review period, and then evaluates whether the proposed

Basis for Conditional Approval
<p>EPA has conditionally approved the disposal/cleanup option for the Sitcum Waterway, in conjunction with the Blair Dredge/Milwaukee Fill Project. It should be noted that this approval process is unique to this project.</p> <p>EPA's conditional approval is consistent with the Commencement Bay ROD cleanup plans and is based on the following reasons:</p> <ul style="list-style-type: none"> ▼ sediment cleanup will proceed after controls are in place to minimize potential recontamination from drainage into the waterway, ▼ sediment cleanup objectives for the Sitcum Waterway will be achieved, ▼ the preliminary information indicates that the option may be constructed in a manner that meets EPA requirements and is protective of human health and the environment, ▼ the option takes advantage of disposal capacity in a commercial development project thus addressing the limited availability of disposal sites, ▼ a key element of the Puyallup Tribe of Indians Settlement Act of 1989 is met, ▼ the Port has elected to perform the work on an expedited time frame, ▼ the compensatory mitigation plan is based on the most recent EPA and resource agency policies, ▼ disposal of contaminated sediments in a nearshore fill will be utilized only in conjunction with an on-going development project as stated as a ROD preference and consistent with the Clean Water Act requirements for such fill projects, ▼ the cleanup option is cost-effective.

project is the most practicable alternative and has the least adverse environmental impact. The Corps also considers whether the project meets specific environmental review criteria and whether it incorporates adequate compensatory mitigation. If so, the Corps issues a 404 permit.

In this case the Section 404 review is being done by EPA under the Superfund program in coordination with the Corps and resource agencies. Under Superfund, EPA is authorized to approve a project like this if it is part of a Superfund remedial action and it meets all of the appropriate requirements. EPA, in consultation with the Corps, would make the final determination as to whether this project complies with the Section 404 criteria after public comments are reviewed and after the Port provides additional information needed to complete the 404 analysis.

The Clean Water Act also requires that water quality criteria are met during project construction and post-construction. Potential areas of concern are the point of dredging in Sitcum and Blair waterways, and the point of disposal in Milwaukee Waterway (the nearshore fill). Although EPA anticipated in the ROD that such projects may involve some allowable short-term exceedances of water quality criteria during implementation, every effort will be made to minimize such events.

EPA and the Port agree that final determination of compliance with water quality criteria would be made during the remedial design phase of the project. This determination would be made based on final water quality test data to show the potential water quality impacts, and an evaluation of engineering controls to minimize potential water quality impacts.

Condition #3. EPA approval of compensatory mitigation plans.

EPA, the Corps of Engineers and other resource agencies have regulatory authorities and policies that require "compensatory mitigation" to compensate for unavoidable environmental impacts of the nearshore fill project. The Port's mitigation plans must compensate for all permanent, long-term habitat losses from the project.

The agencies reviewed potential impacts to the overall ecological system of Commencement Bay. This included considering ways to increase the habitats which were historically abundant but now scarce in the bay; providing mitigation areas that will benefit animals and plants; and providing mitigation areas that require low maintenance. It also includes evaluating mitigation sites to encourage use by a variety of animals and plants. For instance, a mitigation site or sites may provide benefits for young salmon and shorebirds, and include trees and shrubs to protect habitat areas from disturbance.

The Port's proposed mitigation plans have been accepted for public comment by EPA. The Port's proposed plans are shown on Figure 2 and are summarized below:

Mitigation Area 1: Approximately 9 acres of intertidal habitat (area exposed at low tide) in the mouth of the Milwaukee Waterway. This mitigation area will include approximately 1 acre of saltmarsh. Adjacent to Area 1, 1.6 acres of grasses, shrubs and trees would be planted around the edge of the Milwaukee Waterway.

Mitigation Area 2: Approximately 11 acres of intertidal habitat and 1 acre of shallow subtidal (areas always covered by water) habitat will connect the existing sandflats.

Additional mitigation, approximately 9.5 acres of restored, wetland/aquatic habitat will be created to benefit a variety of animals and plants. Site location and engineering design for this project will be developed in accordance with a schedule in the final Consent Decree.

Condition #4. EPA approval of Remedial Design Plans.

The 1991 Order requires the Port to develop Remedial Design Plans for the cleanup of Sitcum sediments. The plans will describe how the Port's preferred cleanup option will be implemented and will include specifications for: construction of the nearshore fill, habitat mitigation, construction quality assurance, health and safety, contingency plans, and post cleanup operation, maintenance and monitoring. It will also include project schedules and requirements for progress reports to EPA and the Corps. All final plans will be incorporated by reference into the future Consent Decree to be negotiated between EPA and the Port.

The Port plans to submit the Remedial Design plans for the cleanup of Sitcum sediments during this public comment period, and has asked EPA to begin to review these documents during public comment. EPA has agreed to review these plans while emphasizing it has only granted conditional approval of this option. Therefore, the Port must accept the risk that any plans are subject to change based on EPA's consideration of public comment.

Condition #5. *Satisfactory negotiation of Consent Decree.*

EPA will require that the Port of Tacoma satisfy all legal requirements under the Superfund law prior to final approval of this project. This includes agreement to: pay past and future agency oversight costs; perform the work with EPA approval, schedules and specifications; meet performance standards; conduct monitoring in accordance with EPA-approved plans; and implement contingency plans as necessary.

Next Steps

After the public comment period closes, EPA will consider all comments and respond to the comments in a fact sheet. If public comment supports the technical merits of the nearshore fill option and EPA's conditions for approval, then EPA will proceed with negotiations of the Consent Decree. The Consent Decree is a legal document that will contain all of the requirements for the cleanup action. In the spring of 1993, after a public comment period for the Decree, it will be submitted to the Federal Court for approval.

For More Information

If you have questions about the information included in this fact sheet, please contact one of the following EPA staff members toll free in Seattle at 1(800) 424-4EPA or as indicated below:

Margaret Justus, Project Manager, (206) 553-2138

Michelle Pirzadeh, Community Relations Coordinator (206) 553-1272

The reports described in this fact sheet are available for public review at the following locations:

In Tacoma:

Tacoma Public Library
1102 Tacoma Avenue, Northwest Room

Citizens for a Healthy Bay
771 Broadway

Puyallup Indian Tribe
2002 East 28th Street

Port of Tacoma
One Sitcum Plaza

In Seattle:

U.S. Environmental Protection Agency
1200 Sixth Avenue
7th Floor Records Center

Additional information about the Commencement Bay Nearshore/Tideflats Superfund site is available at the locations listed at left as well as at EPA's other regular information repositories listed below:

In Tacoma:

City of Tacoma, Environmental Commission
747 Market Street, Suite 345

Tacoma Pierce County Health Department
3633 Pacific Avenue

Pacific Lutheran Library
121st & South Park Avenue

Kobetich Branch Library
212 Browns Point Blvd.

In Olympia for Source Control Information:

Ecology SW Regional Office
7272 Cleanwater Lane



*Monitoring Well Installation Report
Peninsula and Berm Locations
Sitcum Waterway Remediation Project
Tacoma, Washington*

*Prepared for
Port of Tacoma*

*March 13, 1995
J-3203-26*

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TABLE

- 1 Well Installation, Location, and Elevation Data

FIGURE

- 1 Site and Monitoring Well Location Plan

**APPENDIX A
BORING LOGS AND
MONITORING WELL CONSTRUCTION DATA**

A-1

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**MONITORING WELL INSTALLATION REPORT
PENINSULA AND BERM LOCATIONS
SITCUM WATERWAY REMEDIATION PROJECT
TACOMA, WASHINGTON**

This report documents activities and transmits field data collected during the first phase of new monitoring well installations located around the Milwaukee Waterway nearshore confined disposal site. This work was performed in accordance with the water quality monitoring program of the Operations, Maintenance, and Monitoring Plan (OMMP).

During this project phase, Hart Crowser contractor for the Port of Tacoma (Port), completed the following field activities:

- ▶ Drilling and installing six new groundwater monitoring wells;
- ▶ Completing the new monitoring wells and retro-fitting five existing wells with utility-vault type enclosures;
- ▶ Developing the new groundwater monitoring wells;
- ▶ Installing dedicated sampling equipment in the monitoring wells; and
- ▶ Surveying the new and existing well locations.

This work was completed during the period January 23 through February 17, 1995. A seventh well will be drilled and installed in the Milwaukee fill after completion of the upland improvements. The specific field activities and procedures conducted during this phase of work are discussed below. Well installation and elevation data are presented in Table 1. Figure 1 shows the site plan and monitoring well locations. Drilling logs and monitoring well completion data for the new wells are presented in Appendix A.

Drilling and Well Installation

Drilling and monitoring well installation was conducted by Holt Drilling of Puyallup, Washington, under subcontract to Hart Crowser. The drilling, soil sampling, and well installation was performed using a hollow-stem auger drill rig. A Hart Crowser geologist was on site to direct drilling activities and to collect and log the soils samples. Six new monitoring wells were installed during this phase of work. These include two wells (MW-8 and MW-9) on the peninsula between the Milwaukee waterway and the Puyallup River, three wells (MW-11, MW-12 and MW-13) on the peninsula between the Milwaukee and Sitcum waterways, and one well

(MW-10) in the closure berm. The locations of the new and existing wells are shown on Figure 1.

The borings were logged by collecting split-spoon soil samples at 2.5- and 5-foot-depth intervals. During drilling and well installation, Hart Crowser and EPA representatives discussed and agreed on the appropriate screen interval selection for the monitoring wells. The wells were constructed with 2-inch-diameter, flush threaded schedule 40 PVC casing and screen. Ten- or 15-foot-long, 0.020-inch machine slotted PVC screen was attached to blank casing and placed at the agreed upon depth at each boring location. A filter sand pack, consisting of 10/20 grade, silica sand was placed in the borehole around the well screen section. A bentonite/cement slurry was tremied in the boring from the top of the sand pack to within three feet of the ground surface. The wells were completed by installing flush-to-the-ground, utility-vault type enclosures set in concrete.

Retro-Fit New Monuments for Existing Wells

To facilitate future monitoring and maintenance of wells, Hart Crowser subcontracted S&J Trucking Inc. of Tacoma, Washington to retro-fit existing monitoring wells to be used for future monitoring (MW-1, MW-1A, MW-4, MW-5, and MW-7) and to complete the new monitoring well installations with utility-vault type enclosures.

The utility-vaults measure about three cubic feet and are constructed of concrete walls with a hinged steel door on top. The vaults are installed flush-to-the-ground and set in concrete. Tamper-resistant bolts are used on the vault doors to secure well access.

Monitoring Well Development

To improve hydraulic connection with the water-bearing zones screened, and to remove accumulated fine-grained materials, Hart Crowser developed the new monitoring wells. Well development was performed by alternately surging and bailing the well using a stainless steel bailer, followed by pumping water from the well with a submersible electric development pump. Bailing and pumping continued until at least ten casing volumes of water were removed. In cases where water was added to the well during drilling, the volume of water removed during well development exceeded the volume of water that was added.

Installation of Sampling Equipment

Hart Crowser purchased for the Port and installed the required Geoguard® pumping equipment for the new wells. In cases where existing wells were equipped with Geoguard® pumps but future monitoring is not required, Hart Crowser removed, decontaminated, refurbished, and reinstalled the pumps in new wells. Pumps removed from existing wells that were retro-fit with the utility-vault enclosures were sealed in plastic and labeled. Upon completion of the vault enclosure installation, the pumps were installed back into the same wells from which they were removed.

Pump installation depths are presented with the well installation and survey results in Table 1.

Surveying

Hart Crowser retained Sitts & Hill Engineers, Inc. to survey the new and existing monitoring wells for elevation and horizontal location control. The vertical datum is referenced to mean lower low water (MLLW) and horizontal coordinates are referenced to the Washington State Coordinate Grid System (south zone), NAD 27.

Equipment Decontamination

Before any work began, and between each well location all drilling, soil sampling and well development equipment was cleaned to reduce the potential for cross contamination. Auger sections and drill rods were steam cleaned over a self-contained decon trailer. Soil sampling equipment (i.e., split-spoon samplers), the stainless steel bailer and pumping equipment were cleaned using a non-phosphate detergent (Alconox) wash, then rinsing the equipment in tap water. New poly rope was used at each well location during development.

wellinst.rpt

Table 1 - Well Installation, Location, and Elevation Data

Well ID	Horizontal Location Coordinates ⁽¹⁾		Top of Casing (TOC) Elevation in Feet (MLLW*)	Well Screen Interval		Bottom of Pump	
	North	East		Depth in Feet below TOC	Elevation in Feet (MLLW)	Depth in Feet below TOC	Elevation in Feet (MLLW)
Existing (Retro-fit) Monitoring Wells							
MW-1	708504.553	1525064.553	17.38	18.7 to 28.7	-1.3 to -11.3	27.9	-10.5
MW-1A	708504.730	1525046.353	17.68	64.3 to 74.3	-46.6 to -56.6	69.3	-51.6
MW-4	710229.875	1524689.031	18.01	34.4 to 44.4	-16.4 to -26.4	37.2	-19.2
MW-5	709773.390	1523769.272	17.19	34.9 to 44.9	-17.7 to -27.7	40.2	-23.0
MW-7	710926.546	1523073.249	17.08	38.3 to 48.3	-21.2 to -31.2	43.7	-22.6
Newly Installed Monitoring Wells							
MW-8	710364.669	1523391.477	16.92	32.4 to 47.4	-15.5 to -30.5	39	-22.1
MW-9	711036.674	1522973.707	18.08	46.2 to 56.2	-28.1 to -38.1	49	-30.9
MW-10	711381.695	1523371.764	18.21	32.3 to 47.3	-14.1 to -29.1	37	-18.8
MW-11	711635.223	1523600.379	17.48	30.2 to 45.2	-12.7 to -27.7	35	-17.5
MW-12	711103.740	1524055.830	17.15	46.0 to 56.0	-28.8 to -38.8	49	-31.9
MW-13	710685.116	1524414.321	17.95	34.5 to 49.5	-16.6 to -31.6	39	-21.1

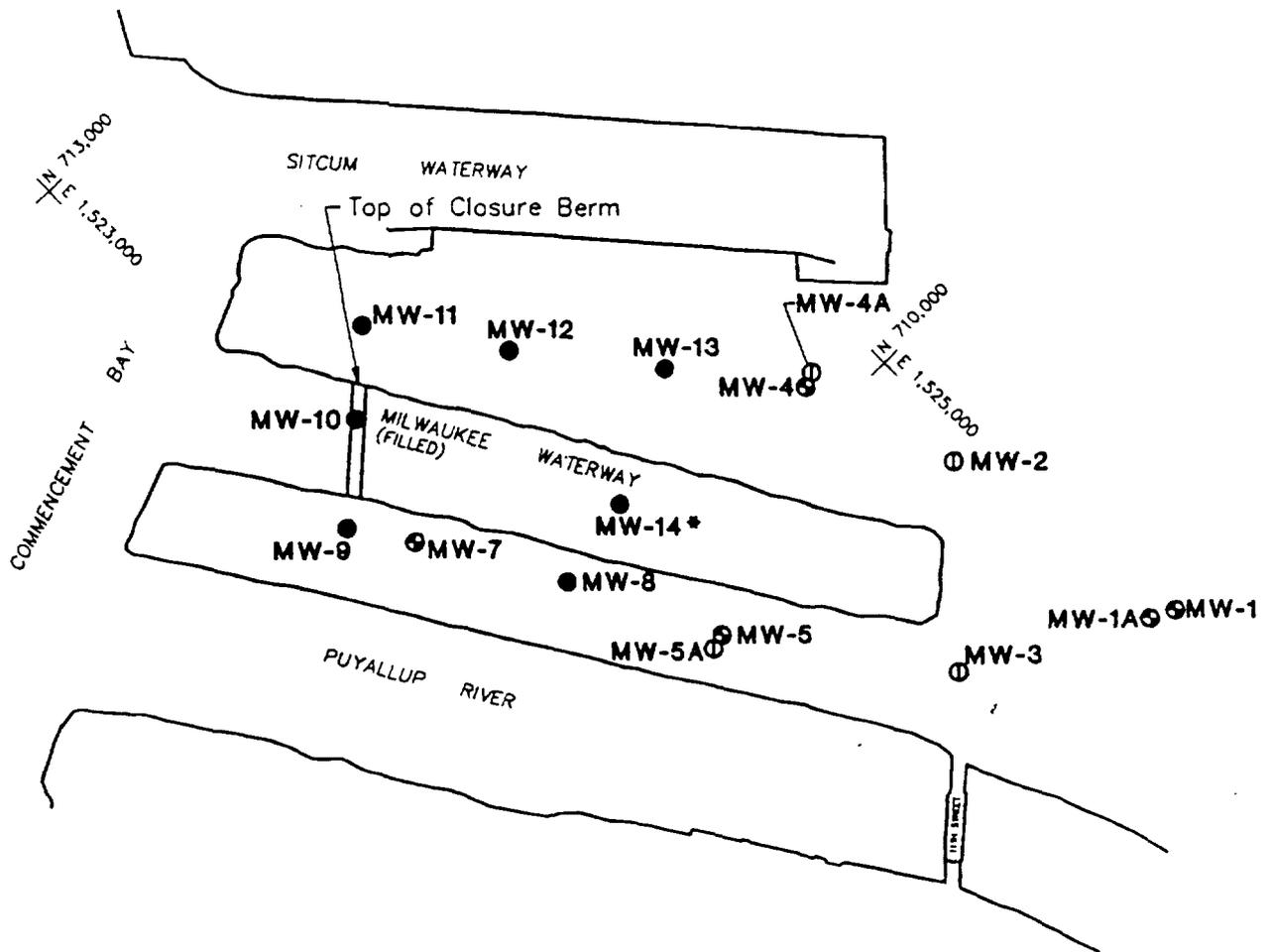
Horizontal datum is on Washington State Grid Coordinate System (South Zone), NAD 27.

Vertical datum is Port of Tacoma/U.S. Army Corps of Engineers—Mean Lower Low Water (MLLW).

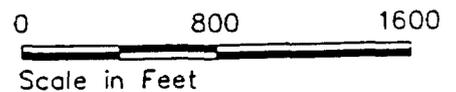
Horizontal location coordinates are referenced to Northeast corner of well enclosure monuments.

(1)
320326\table1

Site and Monitoring Well Location Plan



- MW-12 New Monitoring Well Location and Number
- Monitoring Well to be Installed after Construction of the Upland Improvements
- ⊖ MW-1 Existing Monitoring Well Location and Number for Use in Long-Term Monitoring
- ⊕ MW-3 Existing Monitoring Well Location and Number not for Use in Long-Term Monitoring



HARTCROWSER
J-3203-26 3/95
Figure 1

NEW BEDFORD

FAIRHAVEN

ACUSHNET RIVER

ACUSHNET RIVER

SITE 1

SITE 3

SITE 1A

CONCRETE WALL
LOWER SLOPE 1:1 12' DIA
SLOPE 1:1.5 12' DIA
UPPER SLOPE
STONE 1/4" CONCRETE 1/4" DIA
SLOPE 1:1.2

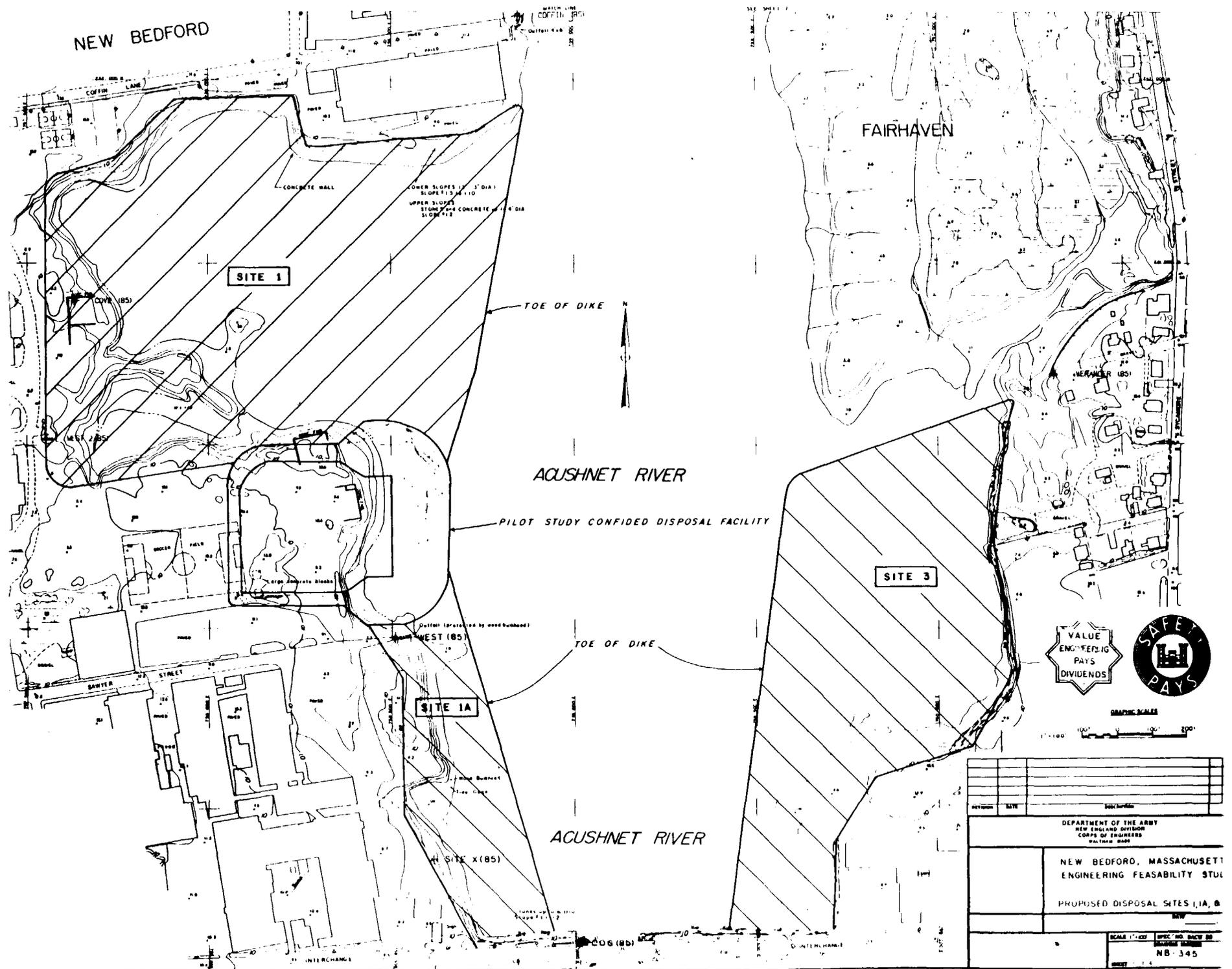
PILOT STUDY CONFIDED DISPOSAL FACILITY



GRAPHIC SCALE



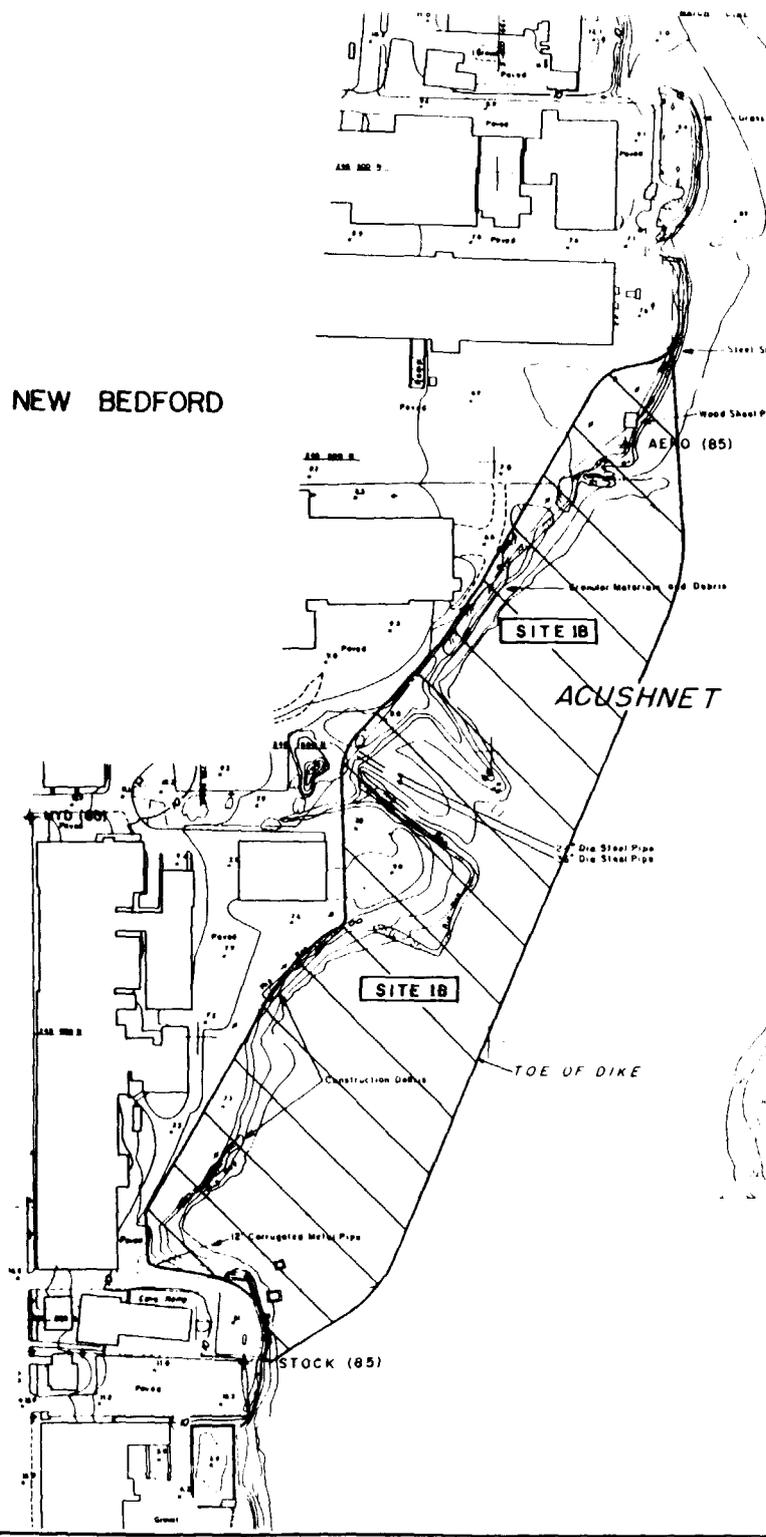
REVISION	DATE	DESCRIPTION
DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM BARR		
NEW BEDFORD, MASSACHUSETT ENGINEERING FEASIBILITY STUDY PROPOSED DISPOSAL SITES 1, 1A, & 3		
SCALE 1" = 100'		
SPEC. NO. DACW 33 NB-345		



(C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O)

⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭

NEW BEDFORD



ACUSHNET RIVER



(1)(A) identifies location of grid block

VALUE
ENGINEERING
PAYS
DIVIDENDS

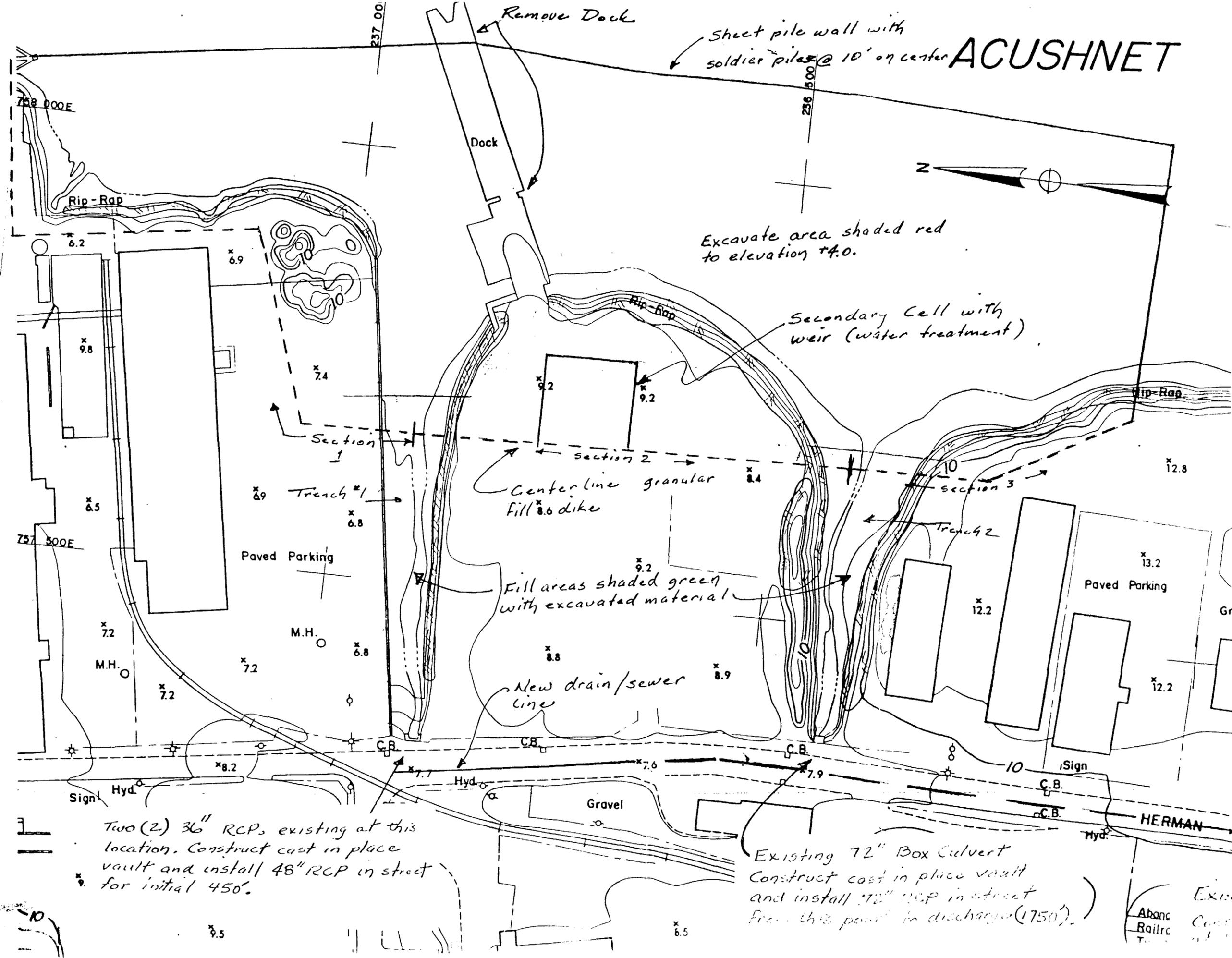


GRAPHIC SCALE



(H) (I) (J) (K) (L) (M) (N) (O) (P)

ACUSHNET



Sheet pile wall with soldier piles @ 10' on center

Excavate area shaded red to elevation +4.0.

Secondary Cell with weir (water treatment)

Centerline granular fill 8.6 dike

Fill areas shaded green with excavated material

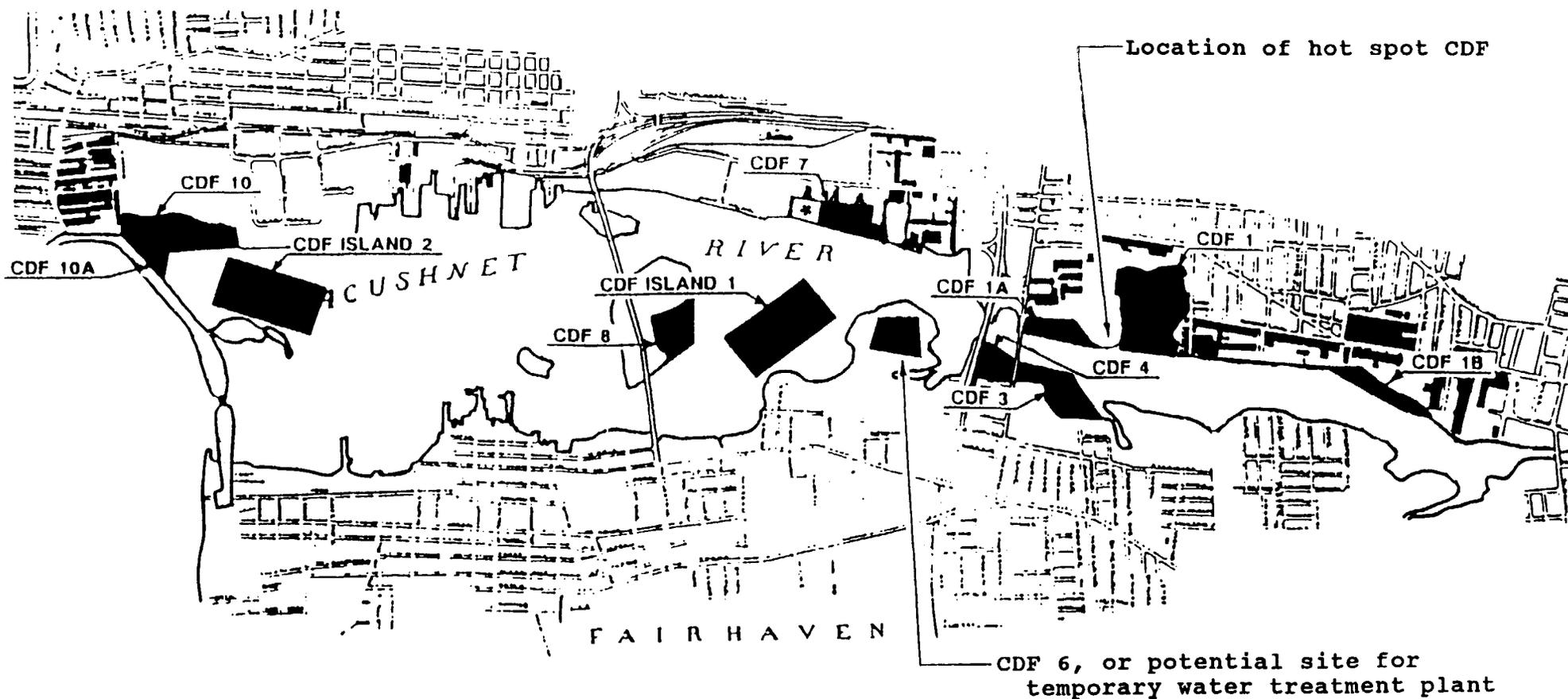
New drain/sewer line

Existing 72" Box Culvert
Construct cast in place vault and install 72" RCP in street from this point to discharge (1750')

Two (2) 36" RCPs existing at this location. Construct cast in place vault and install 48" RCP in street for initial 450'.

1
2
3
4

Abanc Railra
T...



CDF	Volume (cy)
CDF 1	270,000
CDF 1A	28,300
CDF 1B	90,000
CDF 3	134,700
CDF 4	20,000
CDF 6	91,200
CDF 7	120,000
CDF 8	42,000
CDF 10/10A	267,000
ISLAND 1	354,000
ISLAND 2	246,000

Key

* - portion of CDF 7 reserved for navigational dredged material

New Bedford Harbor Superfund Site

Potential CDF Sites for ROD II

Volume of sediments using CDFs 1, 1B and 7 = 475,000 cy

Volume if CDFs located outside of contaminated area = 608,000 cy