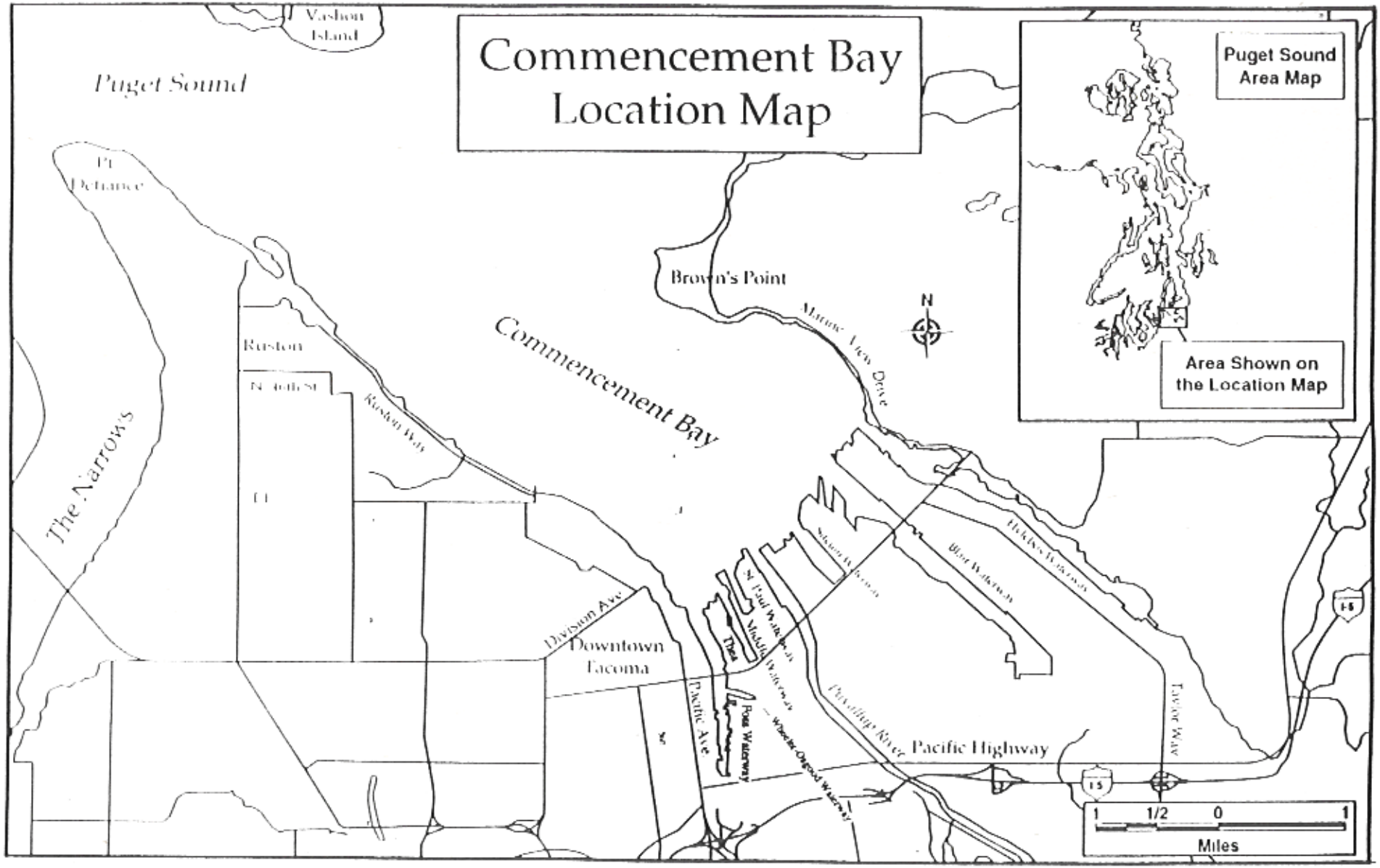
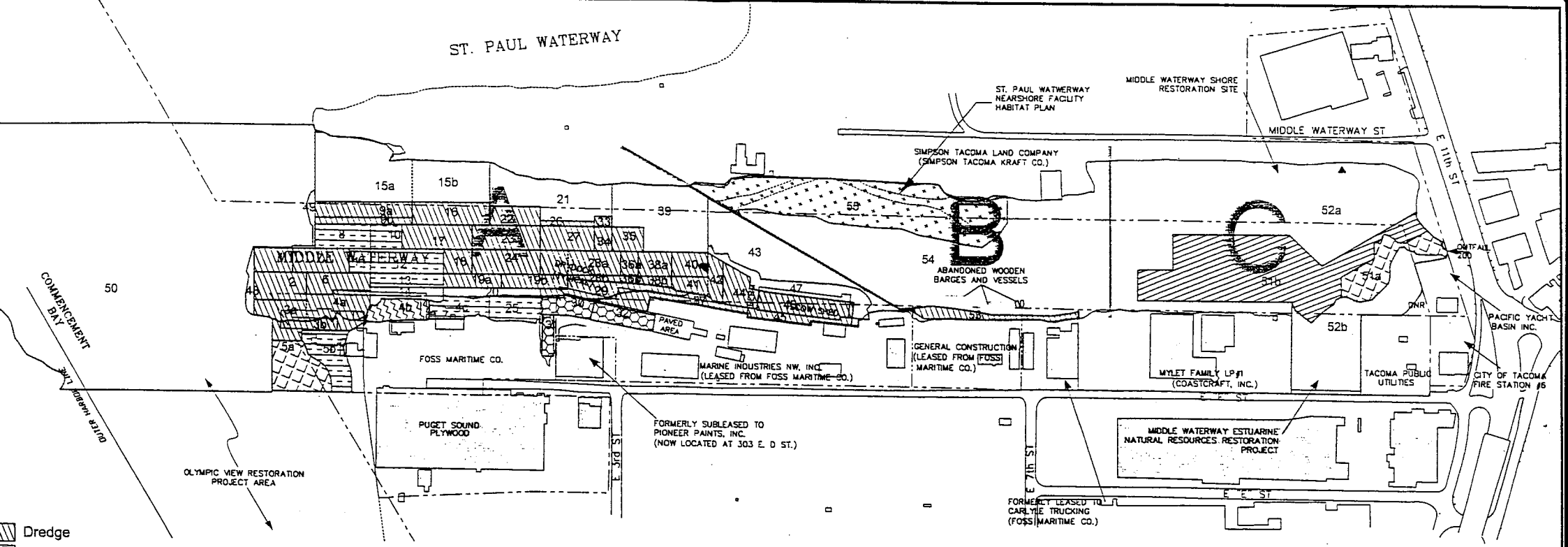

Commencement Bay
Location Map
Puget Sound
Vashon Island
Pt Defiance
The Narrows
Ruston
Ruston Way
Commencement Bay
Brown's Point
Marine View Drive
N
Puget Sound
Area Map
Area Shown on
the Location Map
Division Ave
Downtown
Tacoma
Pacific Ave
Thea
Foss Waterway
Middle Waterway
Wheeler-Osgood Waterway
Puyallup River
Pacific Highway
Blair Waterway
Hylebos Waterway
Taylor Way
I-5
1 1/2 0 1
Miles

Figure 1



WATERWAY AREAS

Working Waterway Area

Central Tideflats

Head

NOTES:

1. Property line information has been compiled from multiple data sources, which have not been verified. These data are to be used for reference purposes only.

2. Horizontal Datum: WA State Plane South Zone (NAD83) Vertical Datum: COE Mean Lower Low Water

3. Side slopes in SMUs 15a, 20, and 21 contain sediments that exceed the SQOs. These sediments, together with side slope portions of SMUs 8, 10, 11, 12, 13, 14, 15b, 39, 47, 48, and 49, will be removed as a result of dredging in adjacent SMUs. The steepest side slopes (e.g., SMUs 15a, 15b, 20, and 21) will be backfilled with clean material.

0 300

Scale in Feet

ANCHOR ENVIRONMENTAL, L.L.C.

MIDDLE WATERWAY

R WHEELER

Figure 2

Middle Waterway Problem Area
SMUs Requiring Remediation,
Natural Recovery, and/or No Action

Table 2. Cost Estimate for Alternative A-2

Item	Unit	Unit Cost	Quantity	Alternative A-2 Extended Costs: Upland Disposal	Alternative A-2 Extended Costs: Aquatic Disposal
Mobilization/Demobilization	LS	$ 75,000	1	$ 75,000	$ 75,000
Dredge and Transport	CY	$ 9.60	91,500	$ 878,400	$ 878,400
Aquatic Disposal	CY	$ 40	91,500	$ -	$ 3,660,000
Upland Disposal					
Dewater and rehandle	CY	$ 15	91,500	$ 1,372,500	$ -
Transport and Disposal	CY	$ 45	96,075	$ 4,323,375	$ -
Thick Cap (Sand)					
Purchase and Deliver	Ton	$ 7.75	11,300	$ 87,575	$ 87,575
Place	Ton	$ 6.25	11,300	$ 70,625	$ 70,625
Thin Cap (sand)					
Purchase and Deliver	Ton	$ 7.75	350	$ 2,713	$ 2,713
Place	Ton	$ 6.25	350	$ 2,188	$ 2,188
Shore Protection					
Purchase and Deliver	Ton	$ 10.25	14,280	$ 146,370	$ 146,370
Place	Ton	$ 6.25	14,280	$ 89,250	$ 89,250
Structure Demolition	SF	$ 10.00	40,000	$ 400,000	$ 400,000
Structure Rebuild-wooden	SF	$ 50.00	40,000	$ 2,000,000	$ 2,000,000
Sheet Pile	LS	$ 950,000	1	$ 950,000	$ 950,000
Habitat Mitigation	LS	TBD	1	$ -	$ -
Subtotal				$ 10,397,995	$ 8,362,120
Engineering Design	Percent	10%		$ 1,039,800	$ 836,212
Const. Monitoring/Mgmt.	Percent	5%		$ 519,900	$ 418,106
Long Term Monitoring	LS	$ 100,000	1	$ 100,000	$ 100,000
Contingency	Percent	30%		$ 3,119,399	$ 2,508,636
Total				$ 15,177,093	$ 12,225,074

Assumptions: Habitat Mitigation costs to be determined

Dredged volume based on 81,000 CY based on the depth of maximum SQO exceedence plus one foot of clean sediment and a 10,000 CY overdredge allowance.

Mechanical dredging with a 12 CY digging bucket (production rate of 1,600 CY/Day)

Three 1,500 CY haul barges used

Two tug boats dedicated to project.

Prices for sand, gravel, and shore protection material from LoneStar Industries

Minimal debris will be encountered

Thick Cap in SMUs 4b, 30, 31, and 32

Clean backfill placed in SMUs 3a, 3b, and 4a.

Shore protection at toe of slope in SMUs 15a, 15b, 20, and 21.

Aquatic Disposal is a delivered cost and includes, design construction compensatory mitigation and long-term monitoring

Dewatering costs based on Port of Seattle East Waterway project

Five percent lime added during dewatering process.

Upland disposal in Subtitle D landfill

Long-Term monitoring based on $25,000 per event; one event every 2 years, i = 7%, e = 3%

Long-term monitoring does not include monitoring at disposal site.

Long-term monitoring at the disposal facility is included in the aquatic disposal unit cost

Structure demolition and rebuild costs from Ron McCray, General Construction

Sheet pile costs based on Sitts & Hill estimate

This cost estimate is in present day (2000) dollars

Notes: Aquatic disposal costs are estimated based on preliminary discussions with the Thea Foss PRPs, the Port of Tacoma, and Occidental Chemical Corporation. These costs are subject to revision and are included for cost comparison purposes only

CY = Cubic Yard

LS = Lump Sum

SF = Square Foot

TBD = To Be Determined

Table 3. Cost Estimate for Alternative B-1

Item	Unit	Unit Cost	Alternative B-1 Quantity	Extended Costs Upland Disposal	Extended Costs Aquatic Disposal
Mobilization/Demobilization	LS	$ 10,000	0	$ -	$ -
Dredge and Transport	CY	$ 5.03	1,200	$ 6,036	$ 6,036
Rehandling	CY	$ 3.00	1,200	$ 3,600	$ 3,600
Aquatic Disposal	CY	$ 40	1,200	$ -	$ 48,000
Upland Disposal					
Dewater and rehandle	CY	$ 15	1,200	$ 18,000	$ -
Transport and Disposal	CY	$ 45	1,200	$ 54,000	$ -
Shore Protection					$ -
Purchase and Deliver	Ton	$ 13.00	1,680	$ 21,840	$ 21,840
Place	Ton	$ 8.50	1,680	$ 14,280	$ 14,280
Habitat Mitigation	LS	TBD	1	$ -	$ -
Subtotal				$ 117,756	$ 93,756
Engineering Design	Percent	10%		$ 11,776	$ 9,376
Const. Monitoring/Mgmt.	Percent	5%		$ 5,888	$ 4,688
Monitoring	LS	$ 15,000	1	$ 15,000	$ 15,000
Contingency	Percent	30%		$ 35,327	$ 28,127
Total				$ 185,746	$ 150,946

Assumptions: Habitat Mitigation costs to be determined.

Prices for shore protection material from LoneStar Industries.

Mobilization/demobilization included in Alternative A-1 or A-2.

Dredged material will be rehandled on to barges and disposed of in an aquatic site.

Dewatering costs based on Port of Seattle East Waterway project

Aquatic Disposal is a delivered cost and includes, design construction compensatory mitigation and long-term monitoring.

Upland disposal in Subtitle D landfill.

Monitoring based on a one-time monitoring event.

Monitoring does not include long-term monitoring at disposal site.

Long-term monitoring at the disposal facility is included in the aquatic disposal unit cost.

This cost estimate is in present day (2000) dollars.

Notes: Aquatic disposal costs are estimated based on preliminary discussions with the Thea Foss PRPs, the Port of Tacoma, and Occidental Chemical Corporation. These costs are subject to revision and are included for cost comparison purposes only.

CY = Cubic Yard

LS = Lump Sum

SF = Square Foot

SF = Square Foot

TBD = To Be Determined

Table 2. Cost Estimate for Alternative C-1

Item	Unit	Unit Cost	Alternative C-1 Quantity	Extended Costs
Mobilization/Demobilization	LS	$ 10,000	1	$ 10,000
Dredge and Transport	CY	$ 9.60		$ -
Rehandling	CY	$ 3.00		$ -
Aquatic Disposal	CY	$ 40		$ -
Thick Cap (Sand)				$ -
Purchase and Deliver	Ton	$ 7.75		$ -
Place	Ton	$ 6.25		$ -
Thin Cap (sand)				$ -
Purchase and Deliver	Ton	$ 7.75	3,500	$ 27,125
Place	Ton	$ 6.25	3,500	$ 21,875
Shore Protection				$ -
Purchase and Deliver	Ton	$ 10.25	250	$ 2,563
Place	Ton	$ 6.25	250	$ 1,563
Habitat Mitigation	LS	TBD	1	$ -
Subtotal				$ 63,125
Engineering Design	Percent	10%		$ 6,313
Const. Monitoring/Mgmt.	Percent	5%		$ 3,156
Long Term Monitoring	LS	$ 100,000	1	$ 100,000
Contingency	Percent	30%		$ 18,938
Total				$ 191,531

Assumptions: Habitat Mitigation costs to be determined.
Removal of the pile of roofing material at MW008-SP is considered negligible.
Prices for sand, gravel, and shore protection material from LoneStar Industries
Long-Term monitoring based on $25,000 per event; one event every 2 years; i = 7%; e = 3%
Long-term monitoring does not include monitoring at disposal site.
Long-term monitoring at the disposal facility is included in the aquatic disposal unit cost.
This cost estimate is in present day (2000) dollars.

Notes: CY = Cubic Yard
LS = Lump Sum
SF = Square Foot
TBD = To Be Determined