US Army Corps of Engineers
Portland District

Quantity Calculations

- Construction
  - Dredging Volume and Location
  - Disposal Location
- O&M
  - Dredging Volumes

CONSTRUCTION
Dredging Volumes

- Hydrographic surveys of channel
  - 7-line condition survey of each reach (29 total)
    - Centerline
    - Inbound lane
    - Outbound lane
    - Oregon cutline
    - Washington cutline
    - 150 feet outside of each cutline

CONSTRUCTION
Dredging Volumes

- Volumes for 45-ft and 48-ft depths
- 100 ft overwidth in selected reaches
- 1995 volume calculated with In-roads
  - 18.9 mcy Columbia new work
- 2002 volumes calculated with Terra Model
  - 14.5 mcy Columbia new work

US Army Corps
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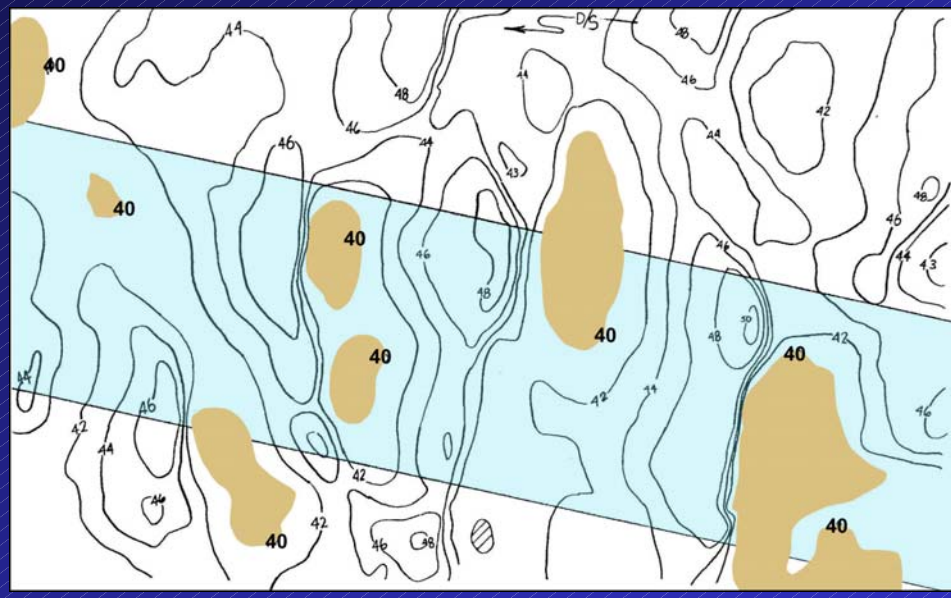
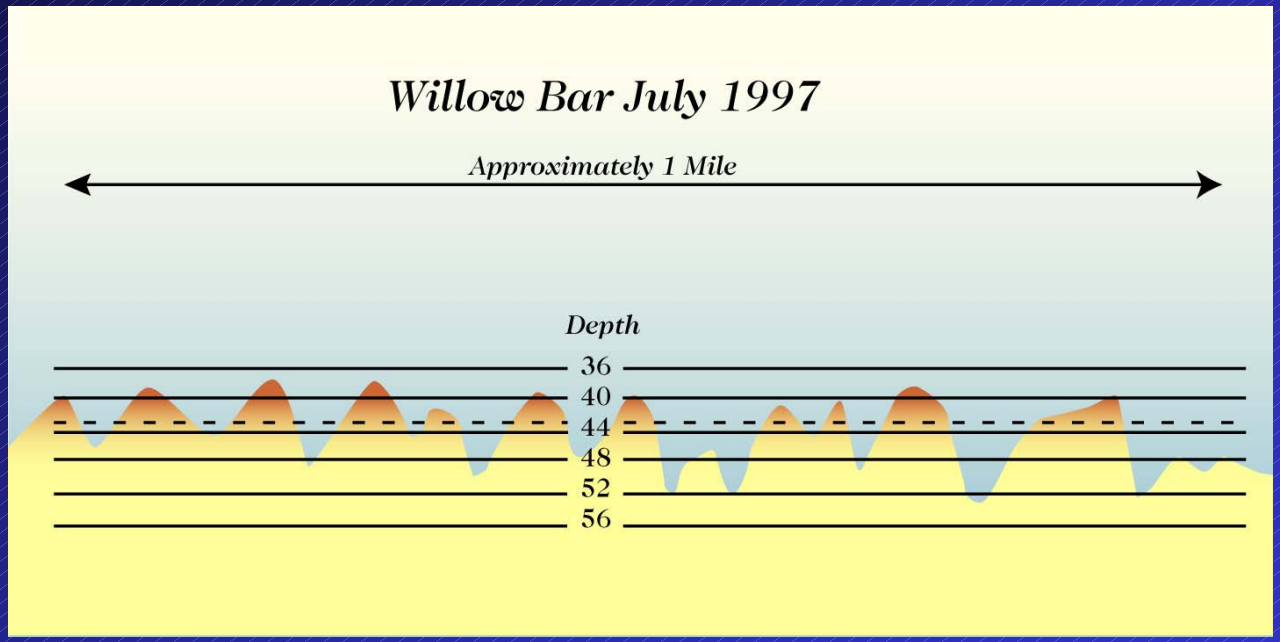
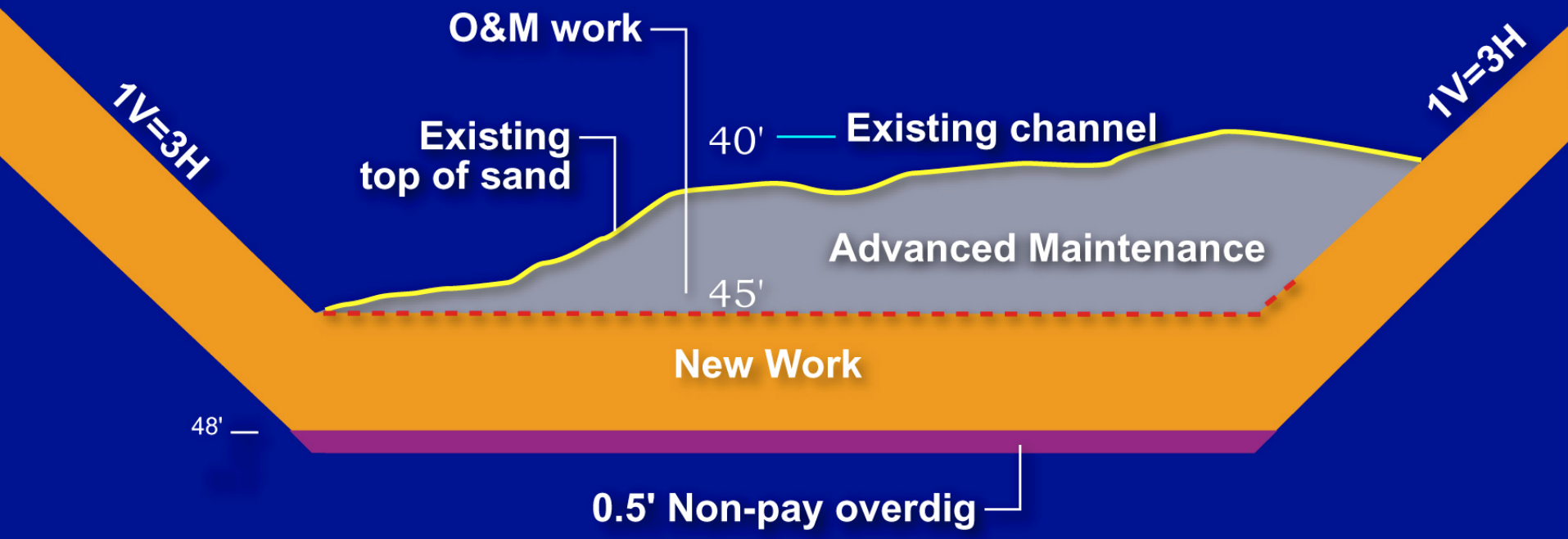
Sand Waves





Generic Channel Prism in Sand



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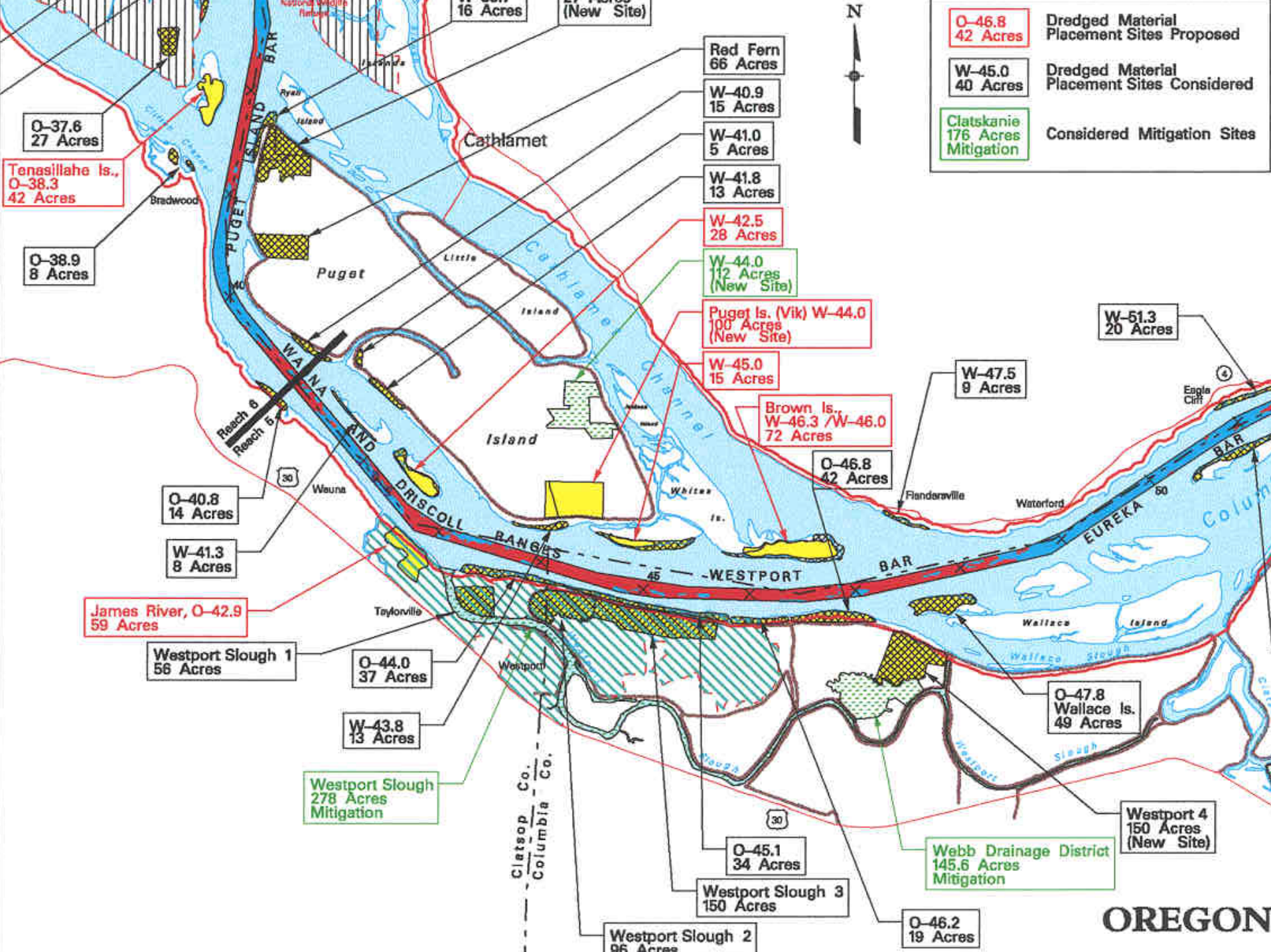
New Work Quantity Calculations

Columbia River Volume Computations 13-02-02
DEEPENING STUDY
Raymond Ryel 503-808-4355 Prepared for: KARL ERIKSEN 808-4892

Full Channel Plus
SPECIAL OVERWIDTH 100' OUT
North=Left looking upstream

sheet ID	CHART	NAME	RIVER MILE	D/S RM	DEPTH 48'	DEPTH 45'	NEW WORK VOLUME	From	To	Side
CL-4	LOWER	DESDEMONA	04+20+00	04+00+00	317,100	222,412	94,688			
				05+00+00	550,640	353,916	196,724			
CL-5	UPPER	DESDEMONA	6+00	06+00+00	66,193	0	66,193			
Bar Total above 48 ft =		1,067,705		07+00+00	1,039	0	1,039			
				8+00+00	61,140	8,742	52,398			
				9+00+00	71,593	8,742	62,851			
CL-9	FLAVEL	BAR	10+00+00	10+00+00	379,028	49,732	329,296			
Bar Total above 48 ft =		1,712,069		11+00+00	833,973	298,900	535,074	11+10+00	12+30+00	NORTH
				12+00+00	360,900	121,292	239,608			
				13+00+00	138,168	72,425	65,743			
CL-14	UPPER	SANDS	13+30+00	14+00+00	226,017	54,585	171,432			
Bar Total above 48 ft =		1,012,708		15+00+00	323,787	51,945	271,842			
				16+00+00	354,274	47,557	306,717	16+00+00	17+00+00	NORTH
				17+00+00	108,631	0	108,631			
CL-18	TONGUE	POINT CROSS	17+28+00	18+00+00	188,889	14,775	174,113			
Bar Total above 48 ft =		499,231		19+00+00	169,841	6,976	162,864			
				20+00+00	140,502	13,283	127,219			



O-46.8
42 Acres
Dredged Material Placement Sites Proposed
W-45.0
40 Acres
Dredged Material Placement Sites Considered
Clatskanie
176 Acres
Mitigation
Considered Mitigation Sites
N
16 Acres
(New Site)
Red Fern
66 Acres
W-40.9
15 Acres
W-41.0
5 Acres
W-41.8
13 Acres
W-42.5
28 Acres
W-44.0
112 Acres
(New Site)
Puget Is. (Vik) W-44.0
100 Acres
(New Site)
W-45.0
15 Acres
Brown Is.,
W-46.3 /W-46.0
72 Acres
O-46.8
42 Acres
W-47.5
9 Acres
W-51.3
20 Acres
O-37.6
27 Acres
Tenasillahe Is.,
O-38.3
42 Acres
O-38.9
8 Acres
Cathlamet
Bradwood
Puget
Island
Little
Island
Cathlamet Channel
Whites Is.
Flanderaville
Waterford
Eagle Cliff
Reach 6
Reach 5
Wauna
O-40.8
14 Acres
W-41.3
8 Acres
James River, O-42.9
59 Acres
Westport Slough 1
56 Acres
O-44.0
37 Acres
W-43.8
13 Acres
Westport Slough
278 Acres
Mitigation
Taylorville
Westport
Clatsop Co.
Columbia Co.
O-45.1
34 Acres
Westport Slough 3
150 Acres
Westport Slough 2
96 Acres
O-46.2
19 Acres
Webb Drainage District
145.6 Acres
Mitigation
Westport 4
150 Acres
(New Site)
O-47.8
Wallace Is.
49 Acres
Wallace Island
Wallace Slough
Westport Slough
PUGET ISLAND BAR
WAUNA AND DRISCOLL RANGES
WESTPORT BAR
EUREKA BAR
OREGON

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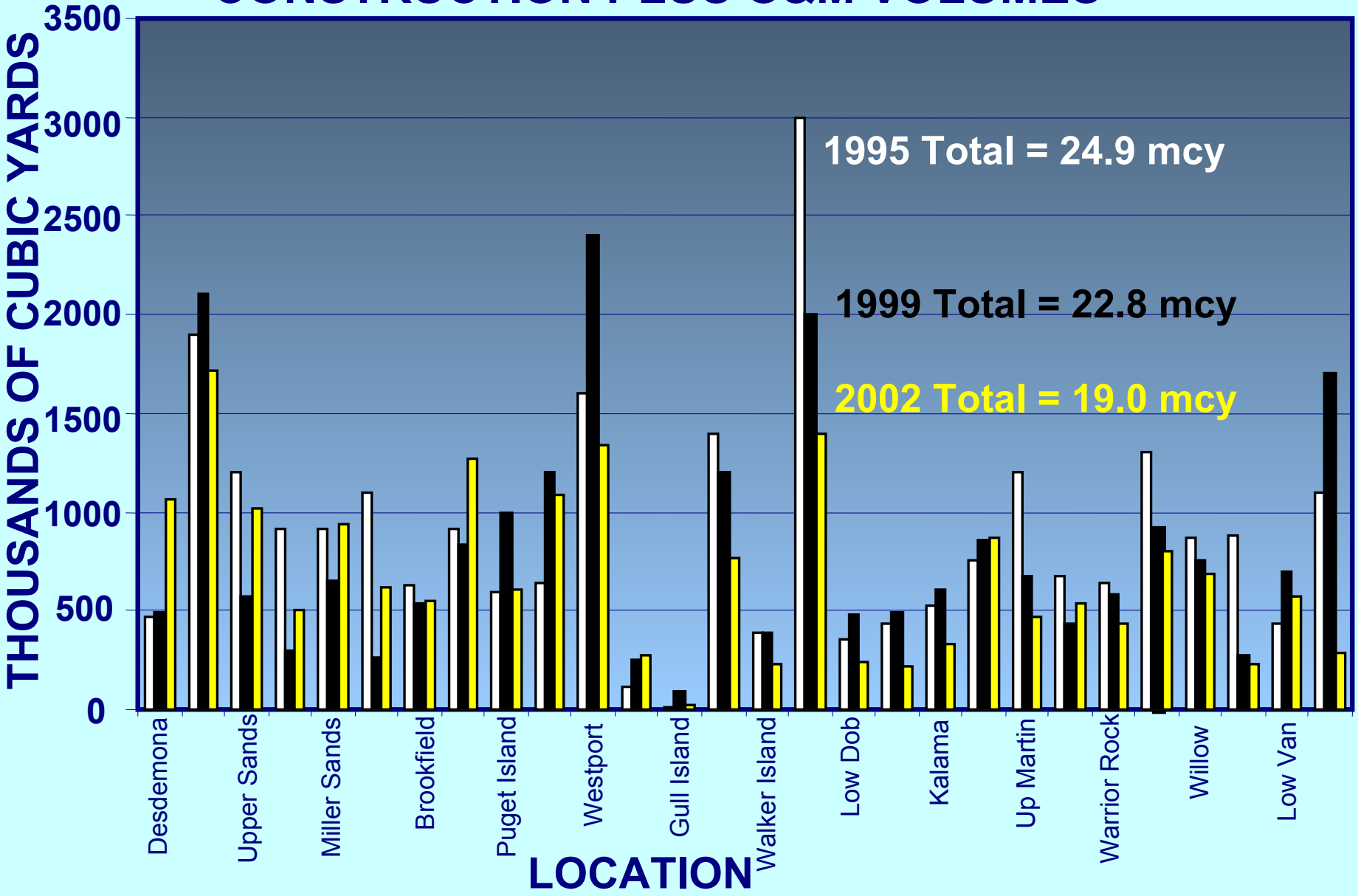
Disposal Site Selection

- Screening Process
- Utilized the D2M2 Module from the Automated Dredging and Disposal Alternatives Management System (ADDAMS)
- Output
  - Least Cost Plan, used in the Baseline Cost Estimate

COLUMBIA RIVER RM 3-106
CONSTRUCTION PLUS O&M VOLUMES



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Quantity Calculations

- Construction
  - Dredging Volume and Location
  - Disposal Location
- O&M
  - Dredging Volumes

O&M VOLUME FORECAST

Bar by Bar Evaluation

- **Dredging and Disposal Practices**
  - **1980-1995 O&M Volumes**
  - **Hopper or pipeline dredges**
  - **In-water, shoreline, or upland disposal**
- **Hydrographic Surveys**
  - **Channel changes between 1982 and 1995**
  - **Historic channel changes**
- **Expected Side-slope adjustment at 6 locations due to deeper channel (RMs 99, 86, 75, 72, 46-42, and 22.5)**

DISPOSAL ALTERNATIVES

- Available Disposal Alternatives
  - 50-65 foot deep water for in-water disposal
  - Shoreline (beach nourishment) sites
  - Upland sites/beneficial uses
- Forecasts for Each Viable Disposal Alternative
- 90 mcy of O&M in First 20 Years
  - 12 mcy more than w/o project (DMMP)
  - 20-25% reduction from historic levels due to changed disposal practices
- Disposal practices will have a dominant influence on future O&M requirements

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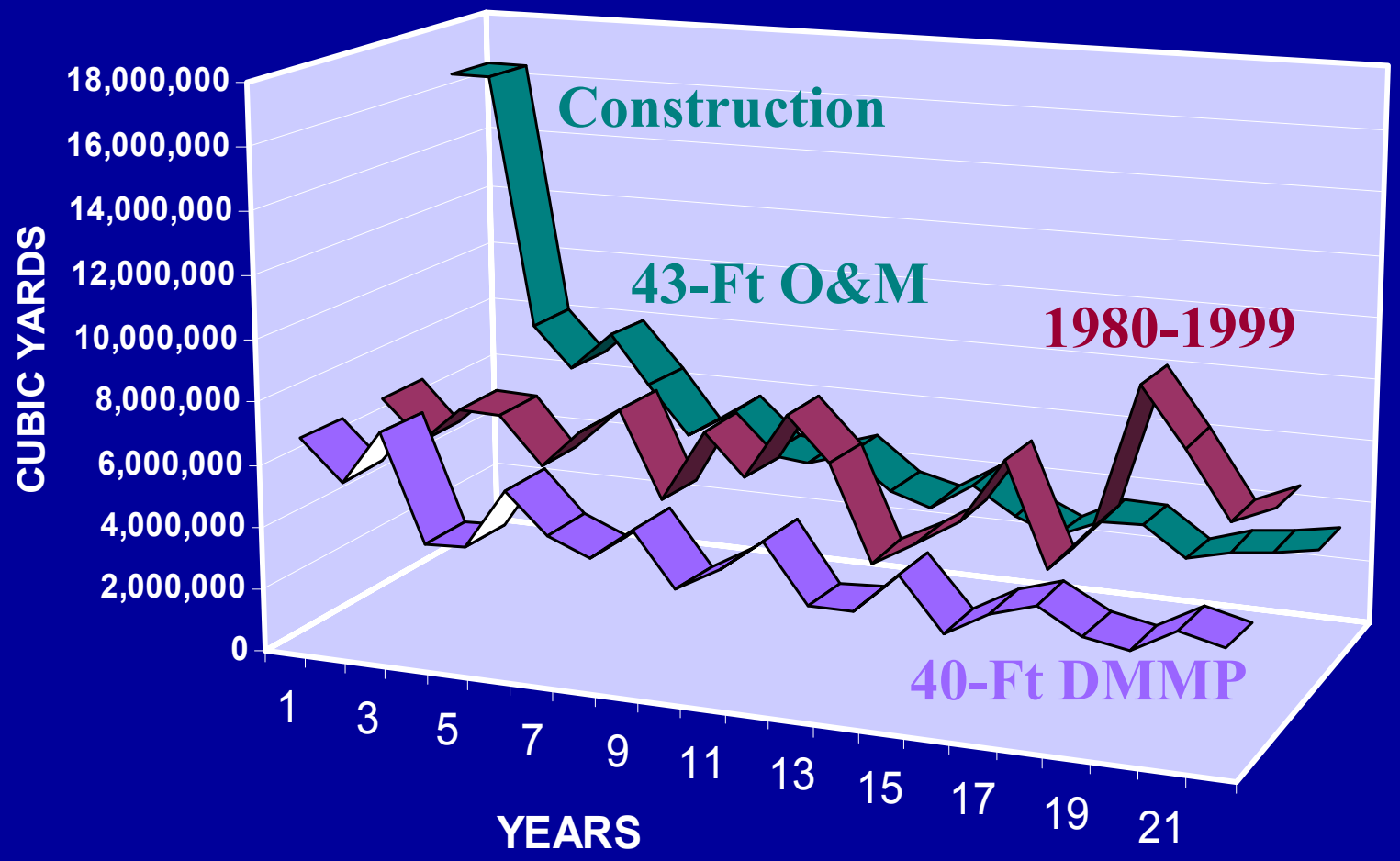
20-Year O&M Comparison

Stella-Fisher Bar

Disposal	40-Foot DMMP	43-Foot Channel
On-Bar In-Water Average Annual	408,750	575,000
Off-Bar Upland Average Annual	140,000	177,500

O&M 1980-1996 Average Annual	411,800

DREDGING FORECAST COMPARISON



O&M COST ESTIMATE

O&M Volumes Allocated by River Mile

- **Disposal similar to construction, except in the estuary**
  - **More in-water (flowlane)**
  - **Miller-Pillar**
- **Unit Costs indexed from 1999 Baseline Cost Estimate**
- **Does not include Mobilization or Site Development Costs**