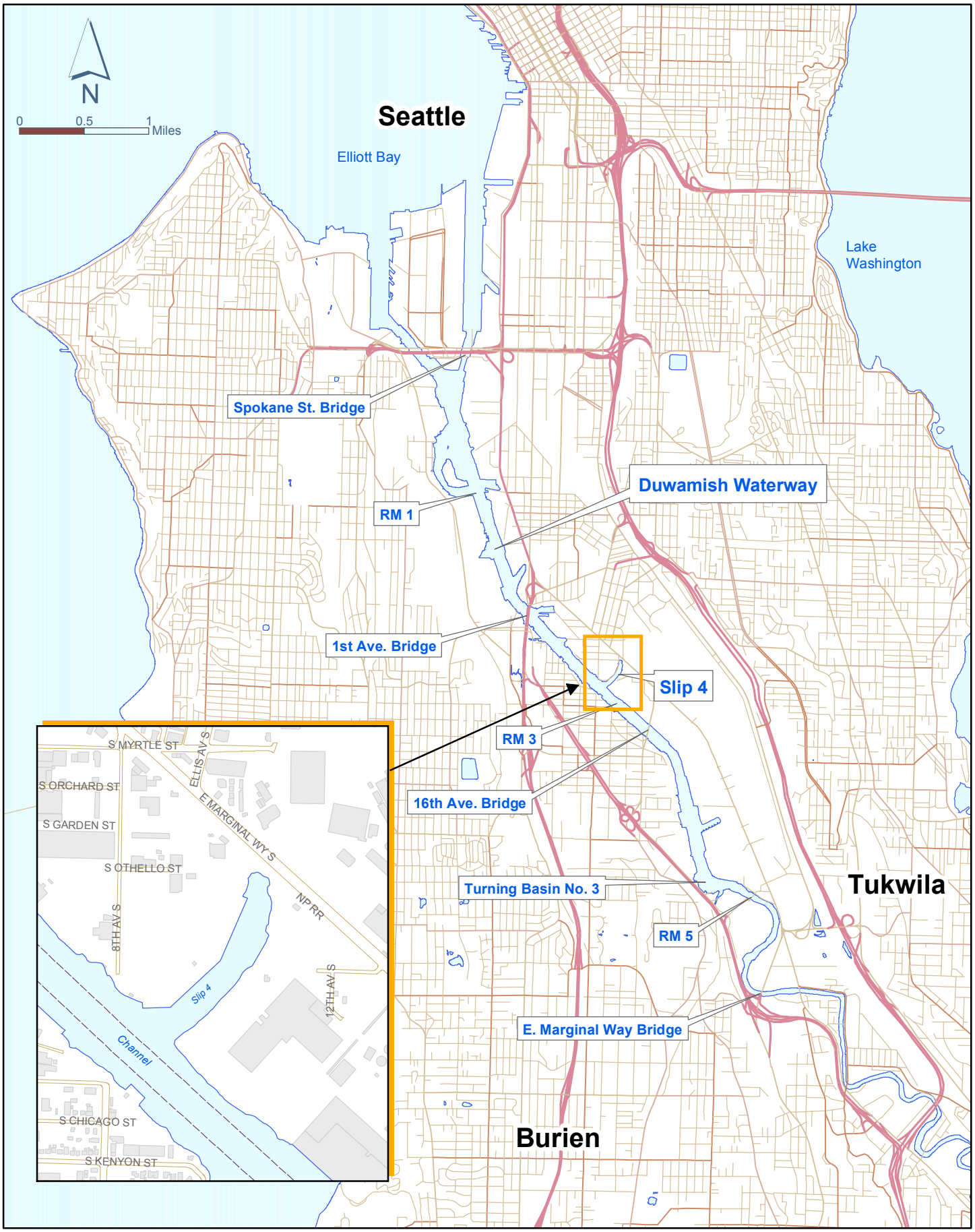
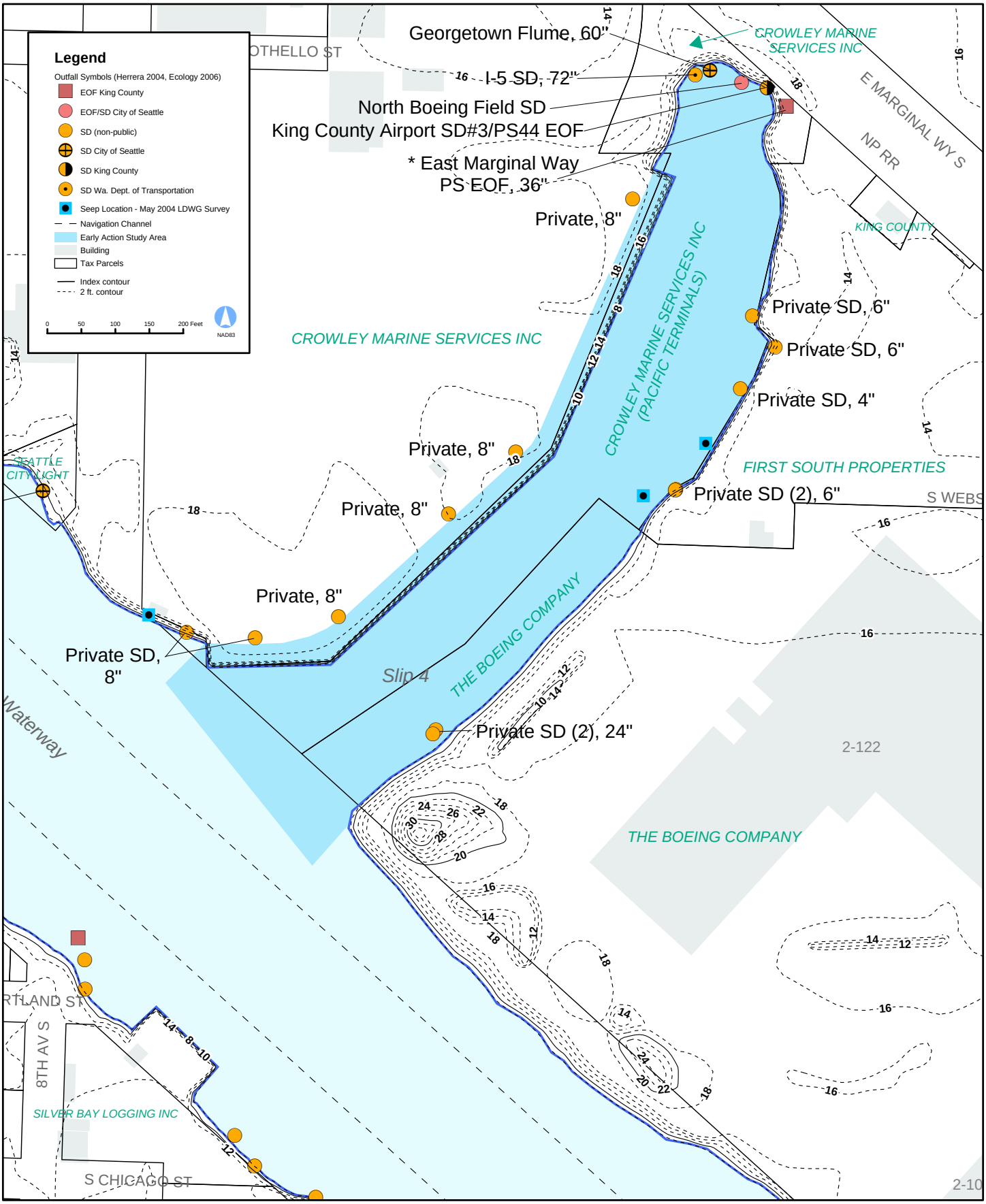


integral consulting inc.

Map Feature Sources: King County GIS,
Seattle Public Utilities, USACE, Ecology, and others.
Plot date: 1/15/2004

Figure 1-1
Vicinity Map
Slip 4 EE/CA



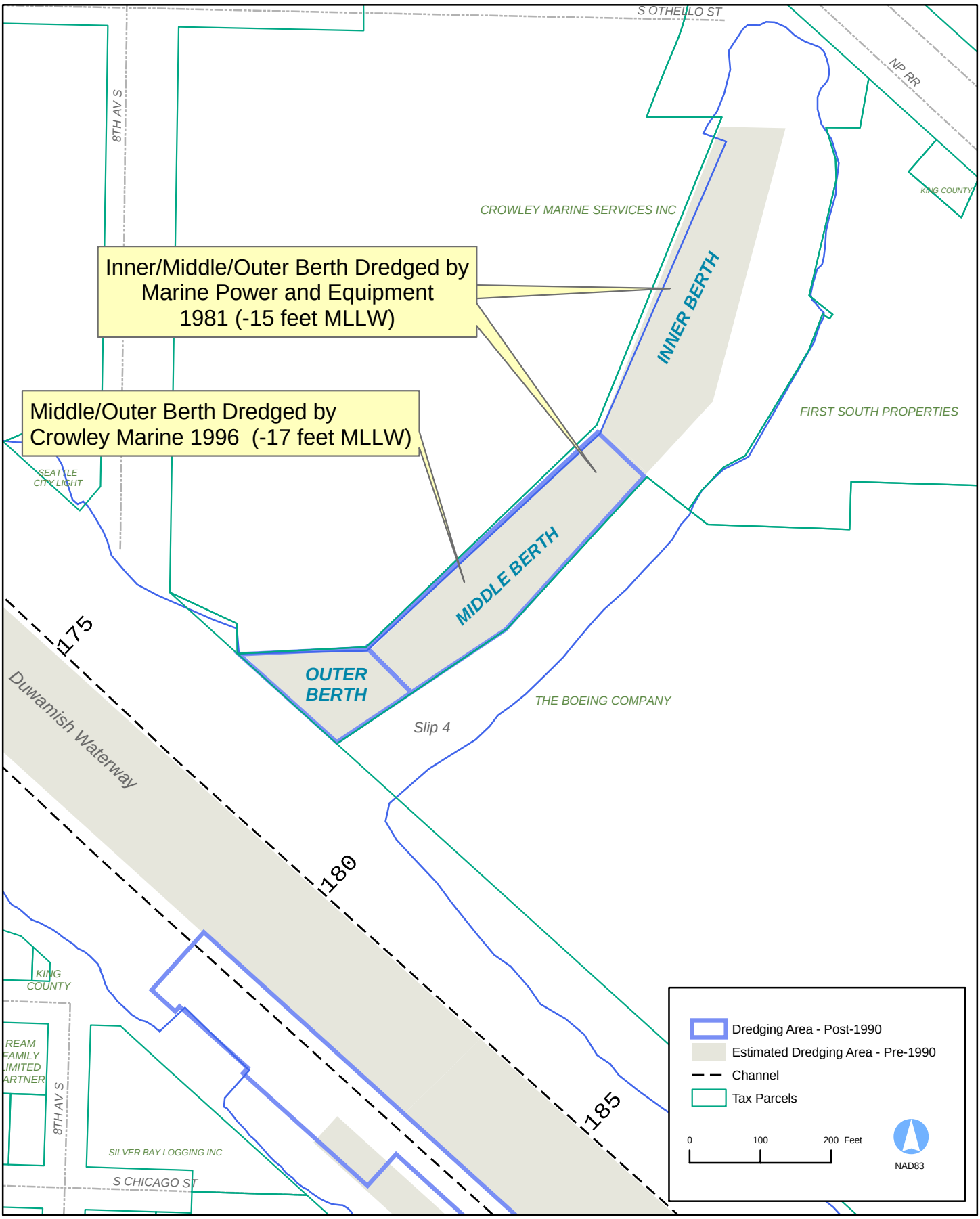
Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-01_Property Boundary_size-BL.mxd)
2/9/2006 -- 9:55:08 AM

integral consulting inc.

* East Marginal Way EOF not observed during SPU (Herrera 2004) survey: location based on King County coordinates.

Map Feature Sources: King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, and others.

Figure 2-1
Slip 4 - EE/CA
Property Boundaries and Ownership

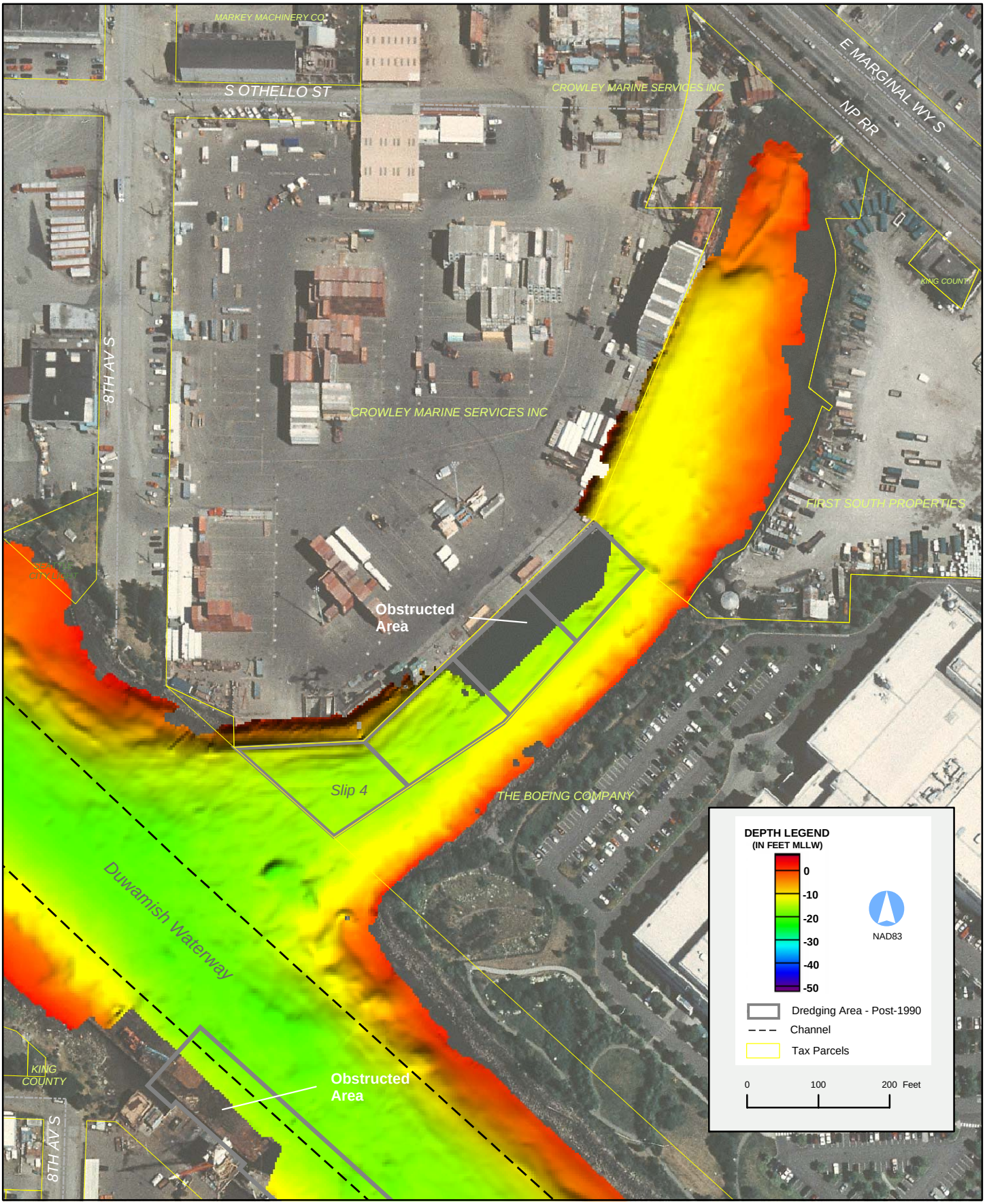


Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-02_Summary_of_Dredging.mxd)
2/6/2006 -- 11:46:46 AM

integral consulting inc.

Figure 2-2
Slip 4 - EE/CA
Summary of Dredging

Map Feature Sources: King County GIS, Seattle Public Utilities, USACE, Ecology, and others.

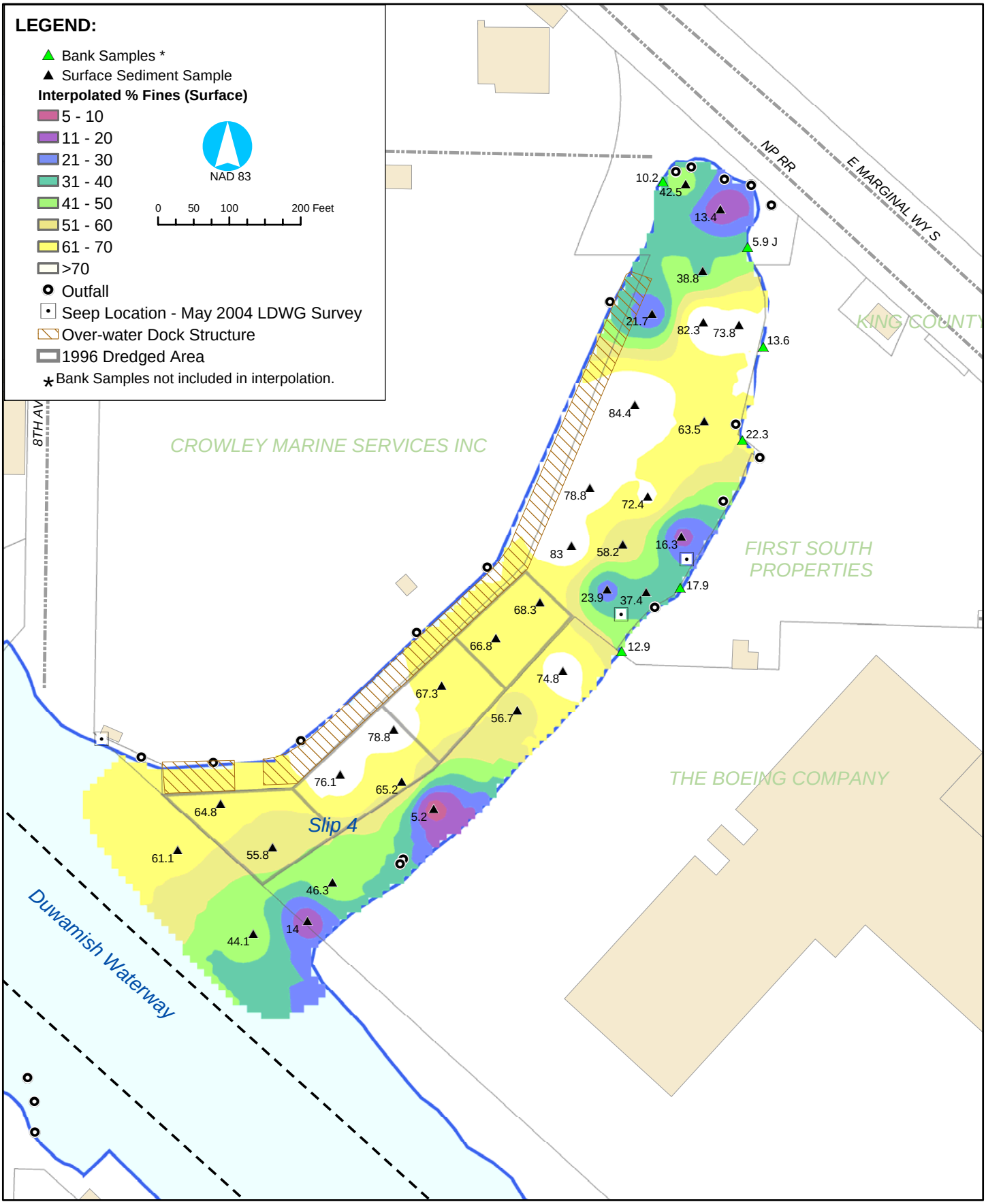


Map Document: (Q:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-03_Bathy_2003_size-AP.mxd)
2/7/2006 -- 2:54:03 PM

integral consulting inc.

Map Feature Sources: King County GIS, Seattle Public Utilities, USACE, Ecology, David Evans & Assoc., and others.

Figure 2-3
Slip 4 - EE/CA
2003 Bathymetry



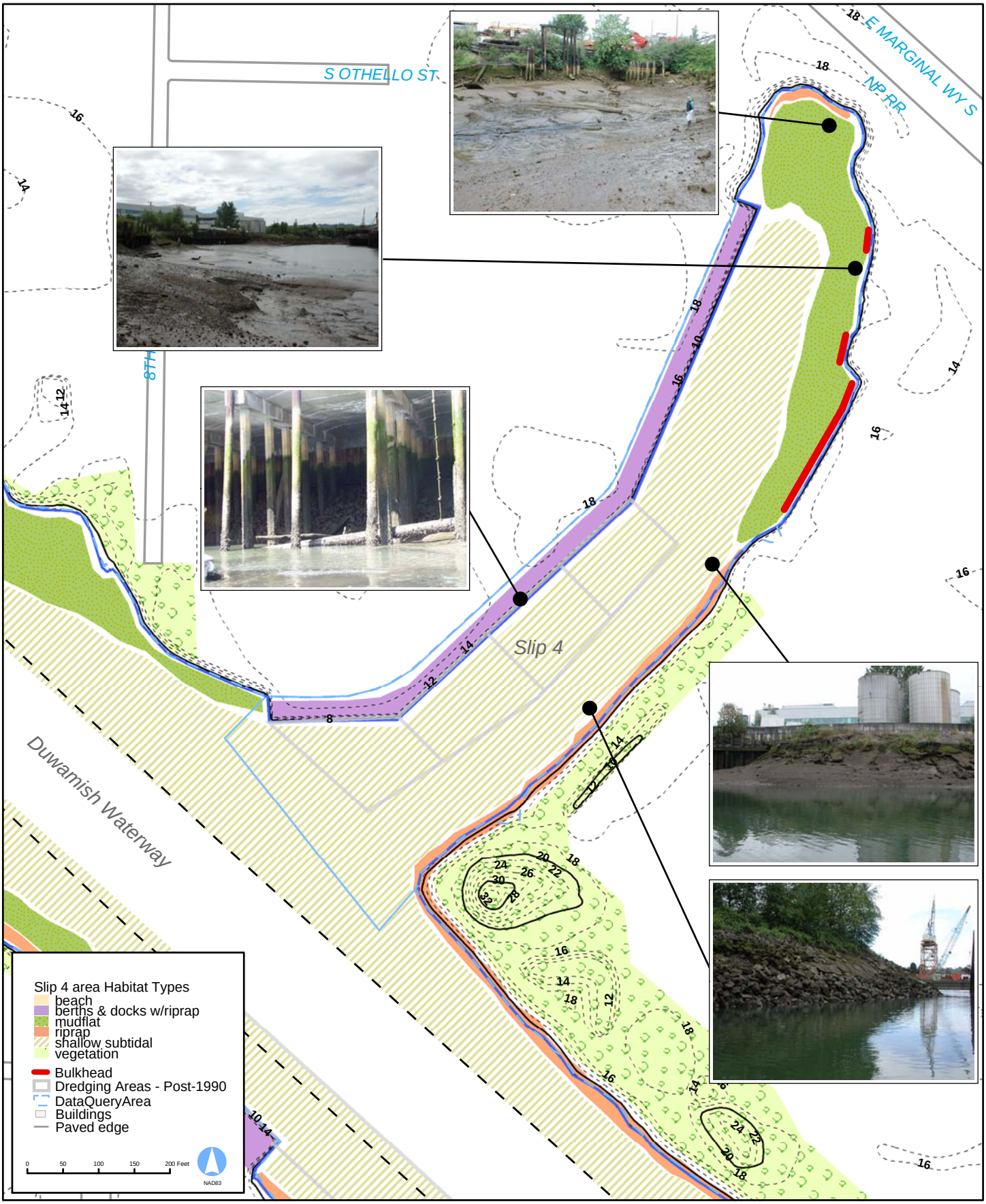
Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-4_Slip4_2004_TOC_and_FINES_Map_Asize_v2_rhn.mxd)
1/12/2006 -- 3:31:18 PM

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Sediment TOC and Fines: Lower Duwamish Project Database 2004 slip 4 data. Percent Fine Grains queried for surface field samples and interpolated with Inverse Distance Weighted Method. Settings: Power of 2, 150' fixed radius search, 10 foot cell size. Field splits and replicates were not used in the interpolation.

Qualifiers:
J = Estimated

Figure 2-4
Slip 4 - EE/CA
Distribution of Percent Fines
in Surface Sediments in 2004

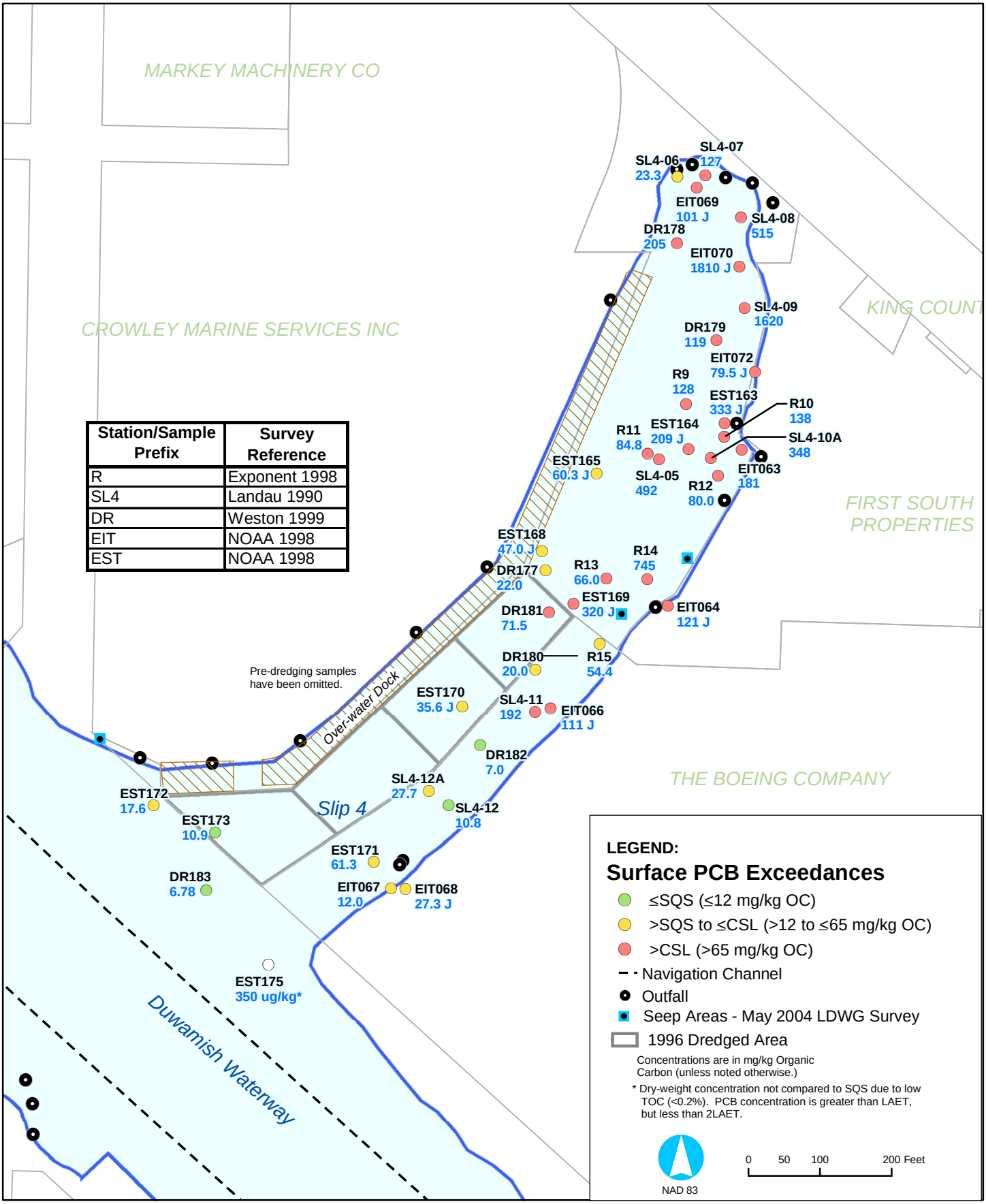


Map Document (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-5_Habitat_size-AP.mxd)
1/12/2006 -- 3:59:51 PM

integral consulting inc.

Figure 2-5
Slip 4 - EE/CA
Habitat Types

Map Feature Sources: King County GIS, Seattle Public Utilities, USACE, Ecology, and others.



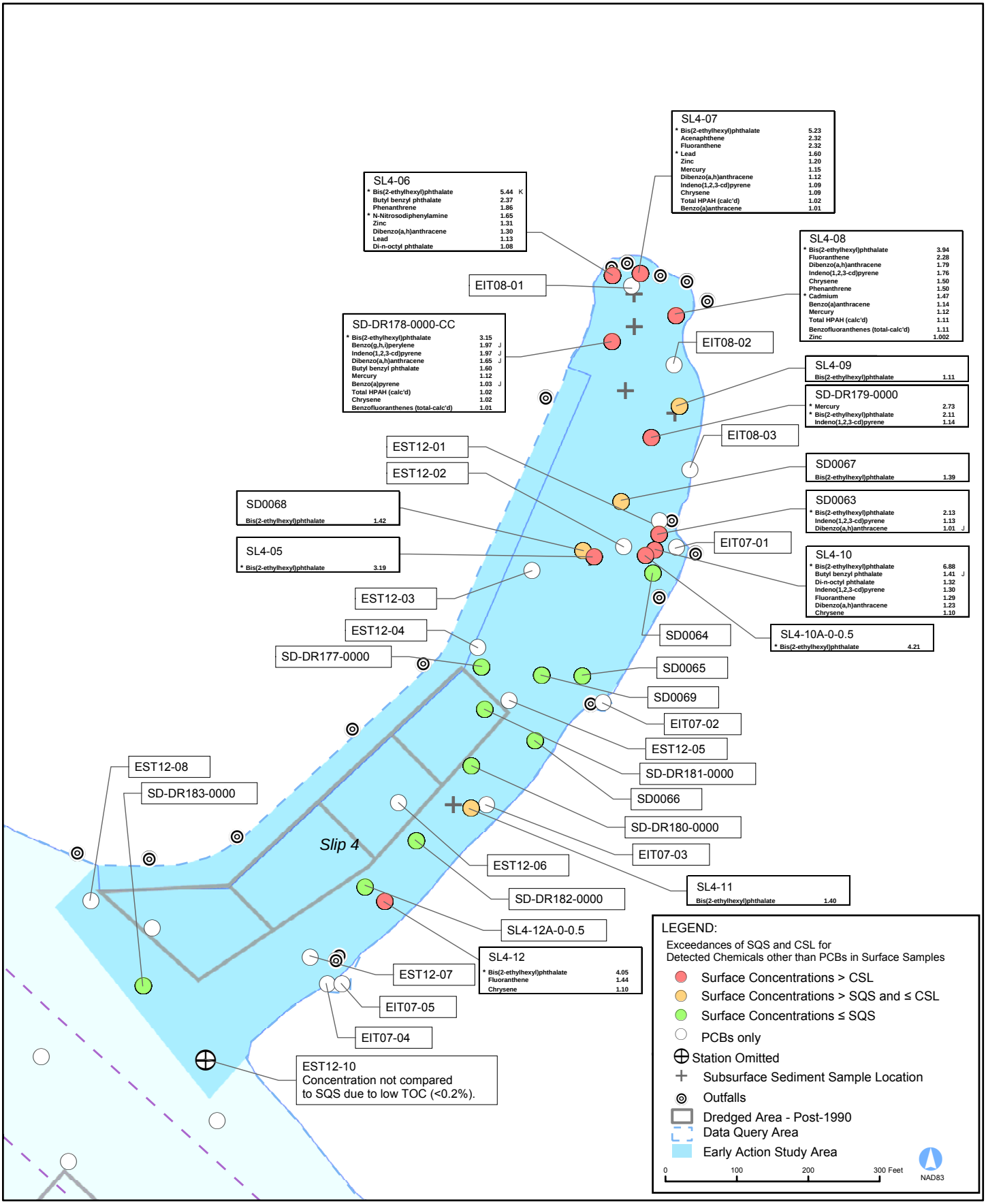
Station/Sample Prefix	Survey Reference
R	Exponent 1998
SL4	Landau 1990
DR	Weston 1999
EIT	NOAA 1998
EST	NOAA 1998

Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-6_Slip4_2004_PCB_Historic_Surface_Map_Asize.mxd)
1/13/2006 -- 2:36:33 PM

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Sediment Chemistry:
Lower Duwamish Project Database and 2004 Slip 4 Survey PCB analysis results.

Figure 2-6
Slip 4 - EE/CA
PCB Concentrations in Surface Sediments Collected in 1990-1998



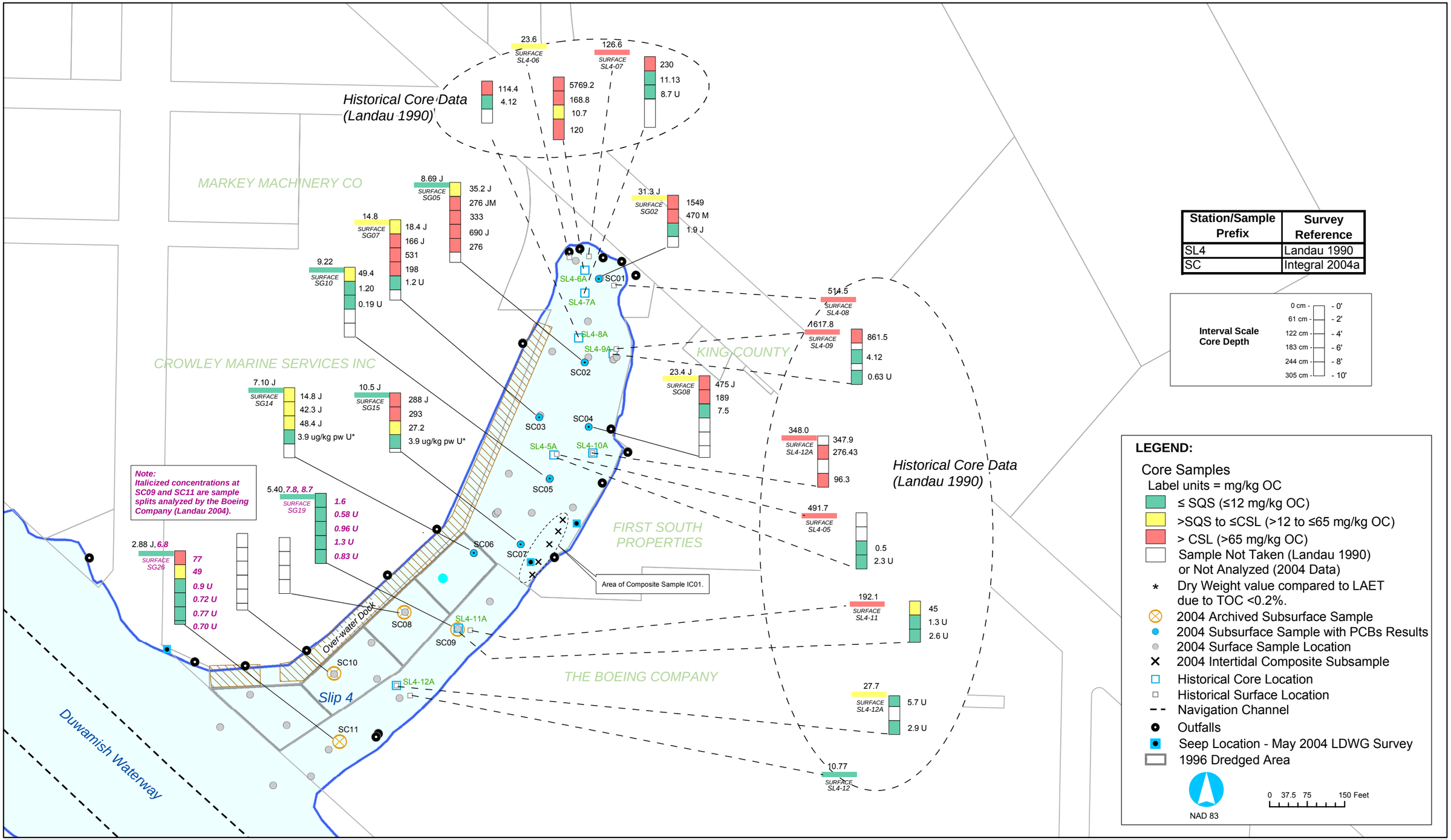
Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-7_EFs_Surface_size-BL.mxd)
1/16/2006 -- 12:05:05 PM

integral consulting inc.

Notes:
SQS exceedance factors shown from highest to lowest.
** Exceedance shown also exceeds CSL*
U = Undetected
J = Estimated
The symbol at each location represents the maximum exceedance for one or more SMS analytes.

Map Feature Sources: King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, and others.

Figure 2-7
Slip 4 - EE/CA
Exceedances of SQS and CSL for
Detected Chemicals other than PCBs
in Historical Surface Sediment Samples



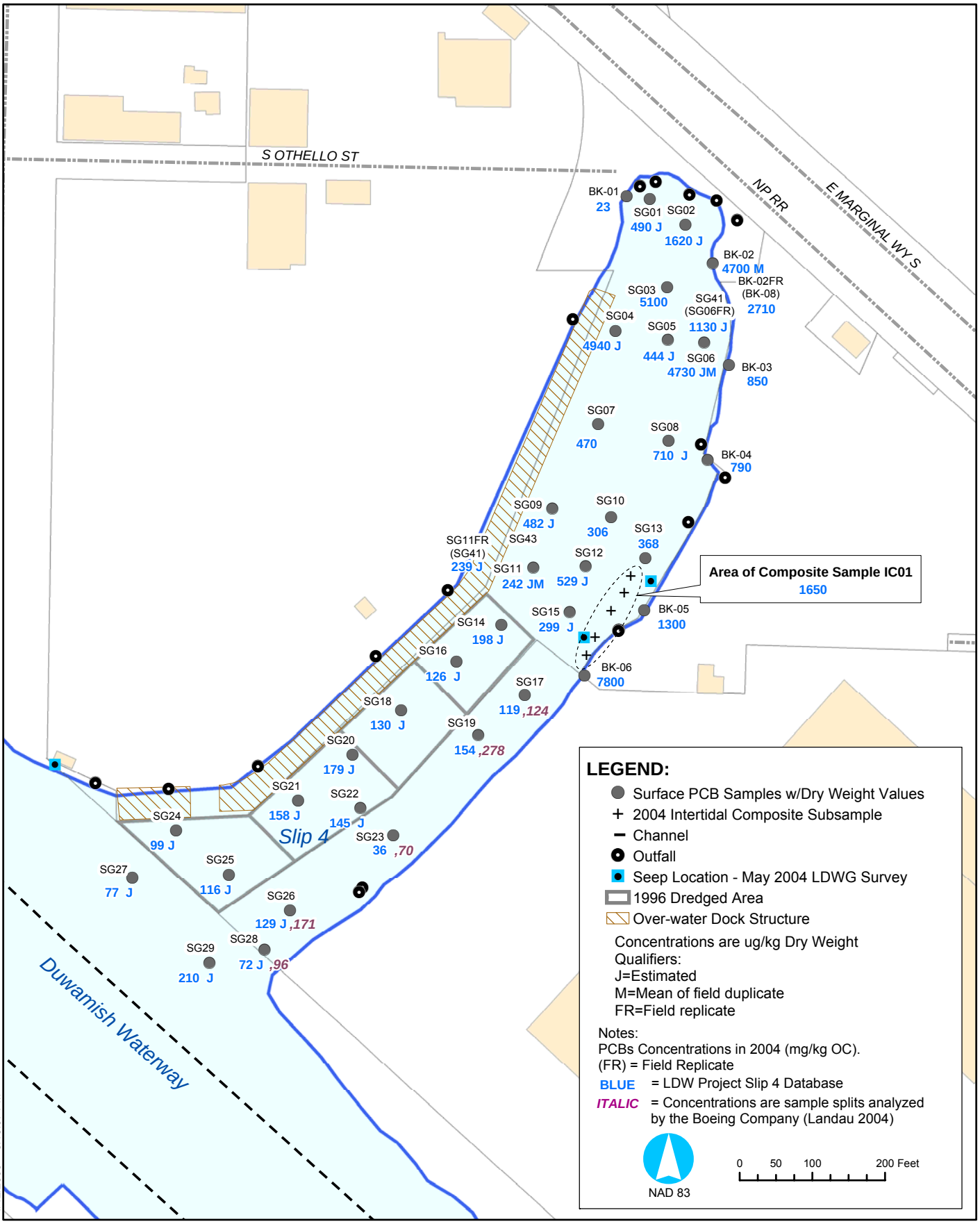
Map Document: (O:\Projects\Duwamish_OU\Projects\Slip4_EECA\Figure_2-8_Slip4_2004_PCB_Coring_Graphics_v3_ifn.mxd)
1/13/2006 -- 2:41:33 PM

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology,
Windward Environmental, David Evans, Inc., and others.
Sediment Chemistry:
Lower Duwamish Project Database and 2004 Slip 4 Survey
PCB analysis results, The Boeing Company.

U=Undetected
J=Estimated
M=Mean of field duplicates (i.e., split)

Figure 2-8
Silp 4 - EE/CA
Historical and 2004 PCB
Concentrations (mg/kg OC) in Subsurface Sediments in Slip 4

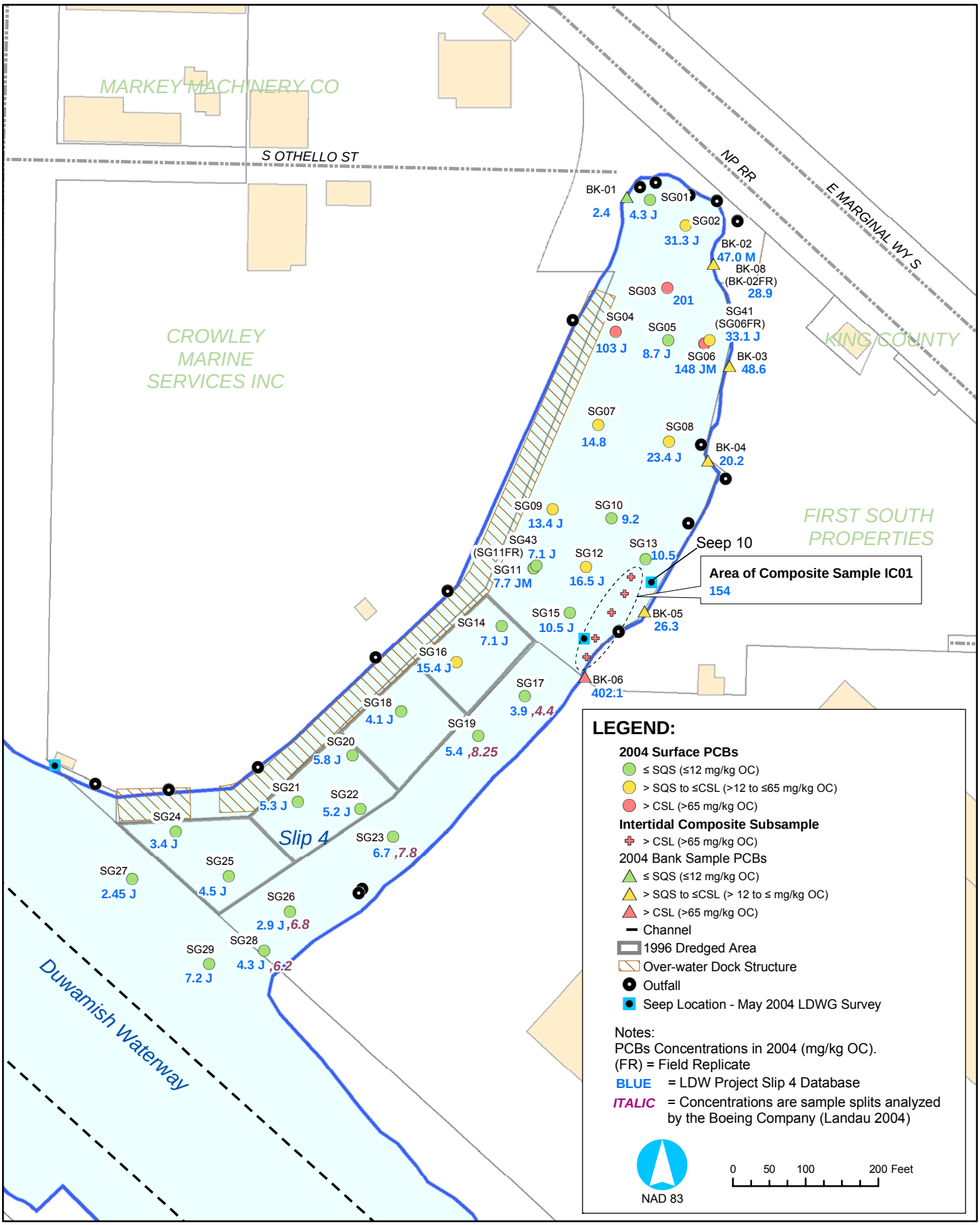


Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-9_Slip4_2004_PCBs_Surface_Map_Asize.mxd)
1/12/2006 -- 3:15:07 PM

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Station locations: Lower Duwamish Project Database and 2004 Slip 4 FSP Navigation Table.

Figure 2-9
Slip 4 - EE/CA
PCB Concentrations (µg/kg DW) in Surface Sediment and Bank Samples Collected in 2004



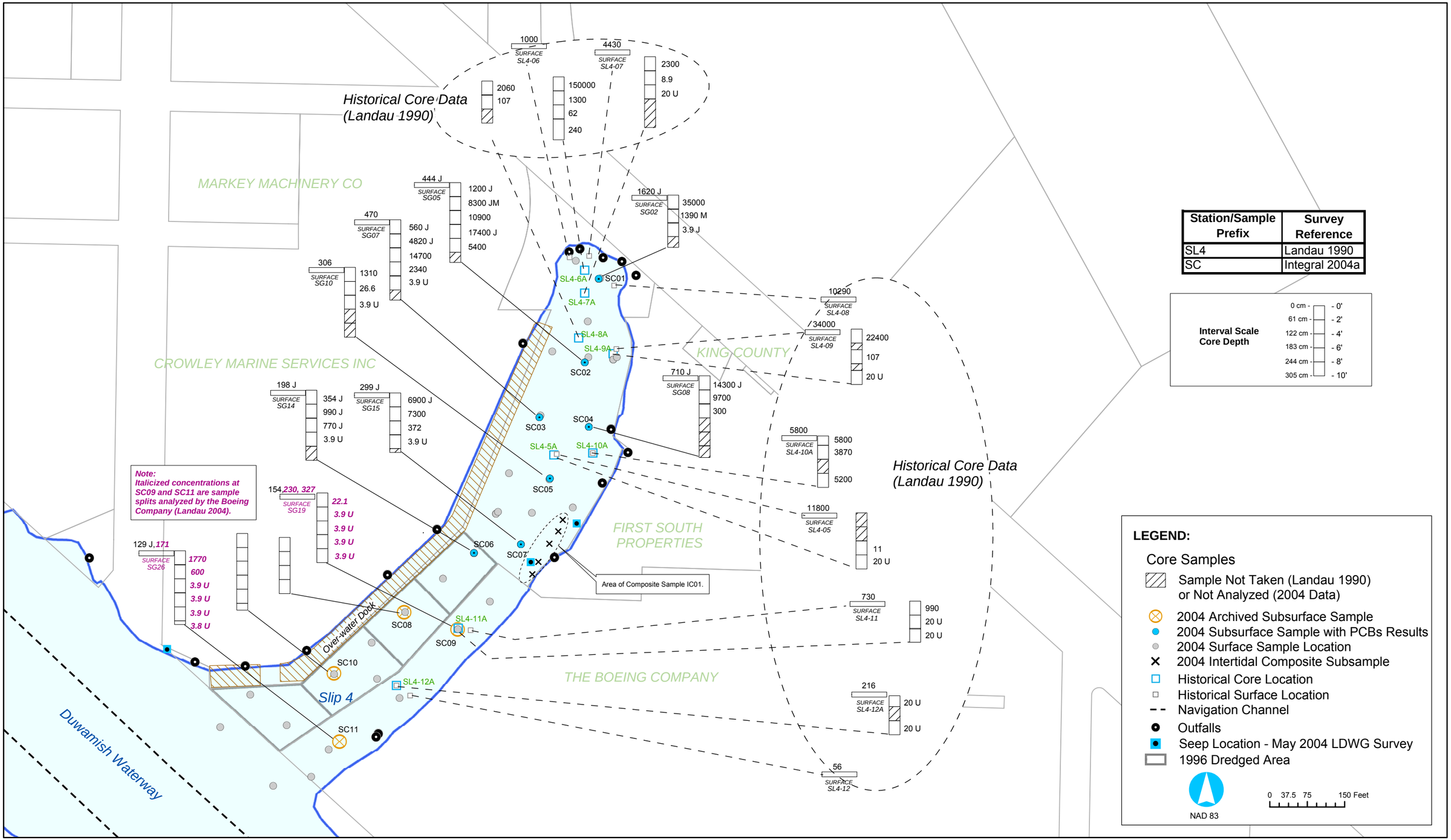
Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-10_Slip4_2004_PCBs_Surface_Map_Asize.mxd)
2/6/2006 -- 2:27:09 PM

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Station locations: Lower Duwamish Project Database and 2004 Slip 4 FSP Navigation Table.

Qualifiers:
J=Estimated
M=Mean of field duplicate
FR=Field replicate

Figure 2-10
Slip 4 - EE/CA
PCB Concentrations (mg/kg OC) in Surface Sediment and Bank Samples Collected in 2004



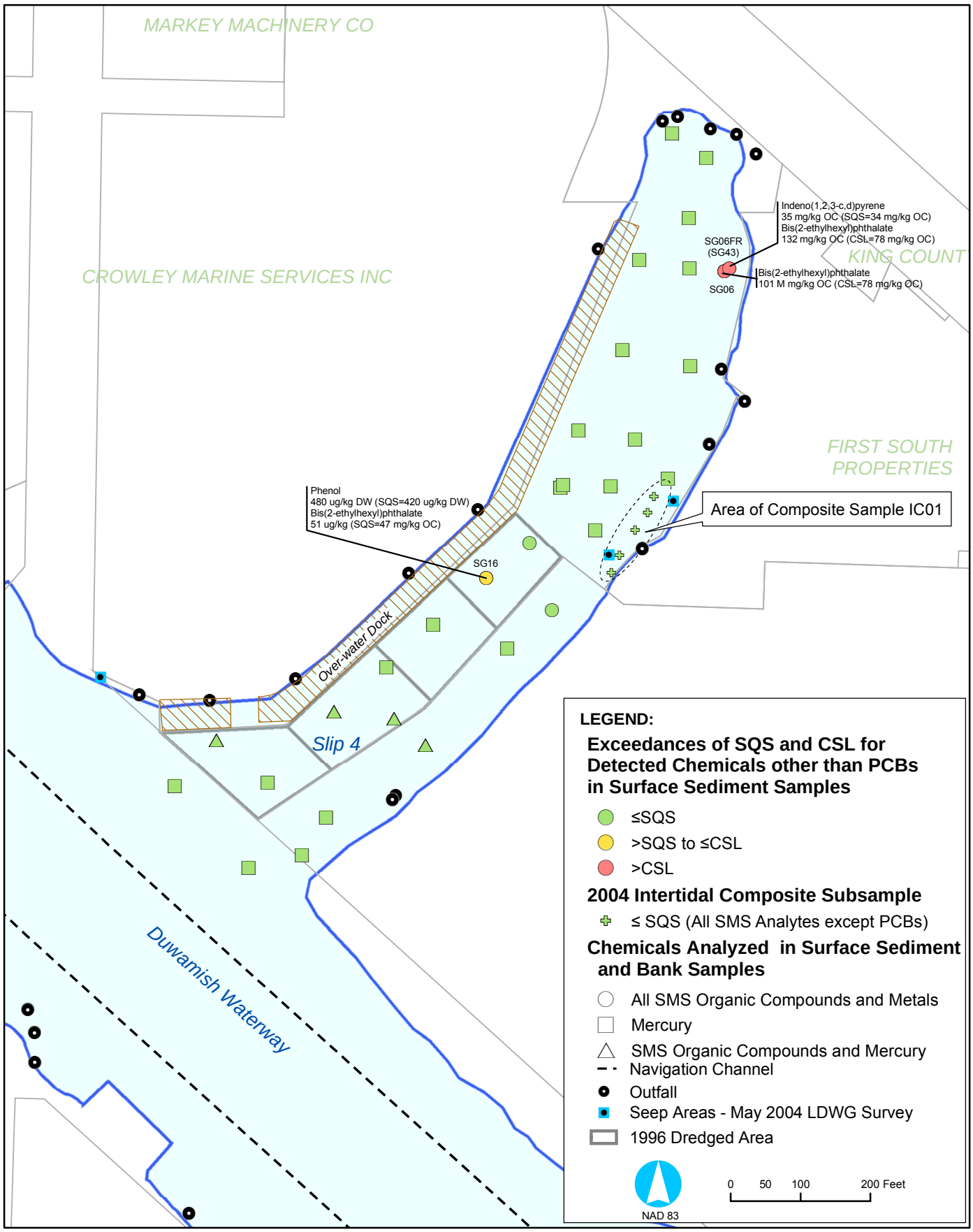
Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-11_Slip4_2004_PCB_Coring_Graphics_DW.mxd)
1/12/2006 -- 4:04:23 PM

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology,
Windward Environmental, David Evans, Inc., and others.
Sediment Chemistry:
Lower Duwamish Project Database and 2004 Slip 4 Survey
PCB analysis results, the Boeing Company.

U=Undetected
J=Estimated
M=Mean of field duplicates (i.e., split)

Figure 2-11
Slip 4 - EE/CA
Historical and 2004 PCB
Concentrations (µg/kg DW) in Subsurface Sediment



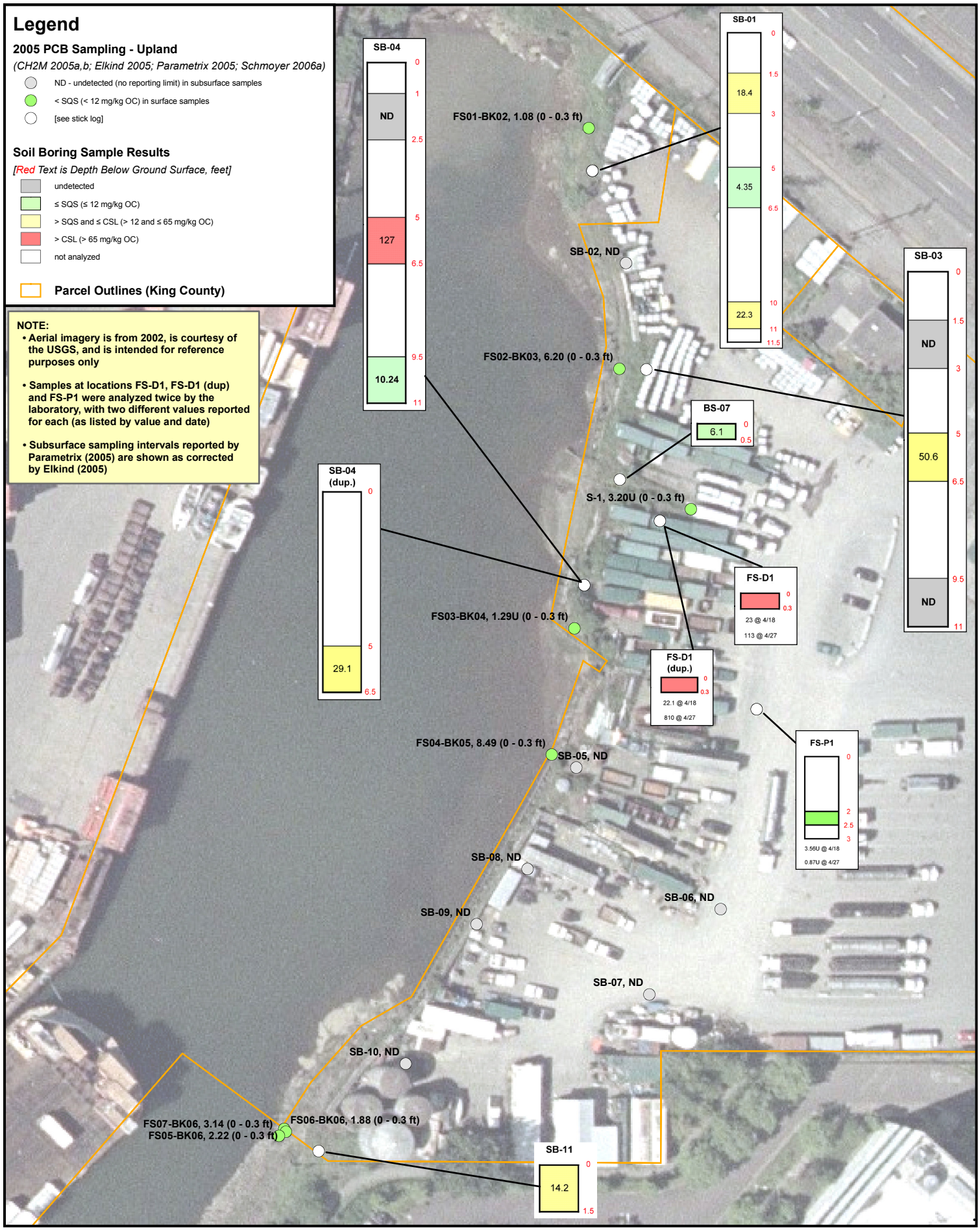
Map Document: (O:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-12_Slip4_2004_Non-PCB_Surface_Map_Asize2.mxd)
2/8/2006 -- 2:35:54 PM

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Sediment Chemistry:
Lower Duwamish Project Database and 2004 Slip 4 Survey PCB analysis results.

M=Mean of Field Duplicate (i.e., split)
FR=Field Replicate

Figure 2-12
Exceedances of SQS and CSL for Detected Chemicals other than PCBs in Surface Sediment Samples Collected in 2004

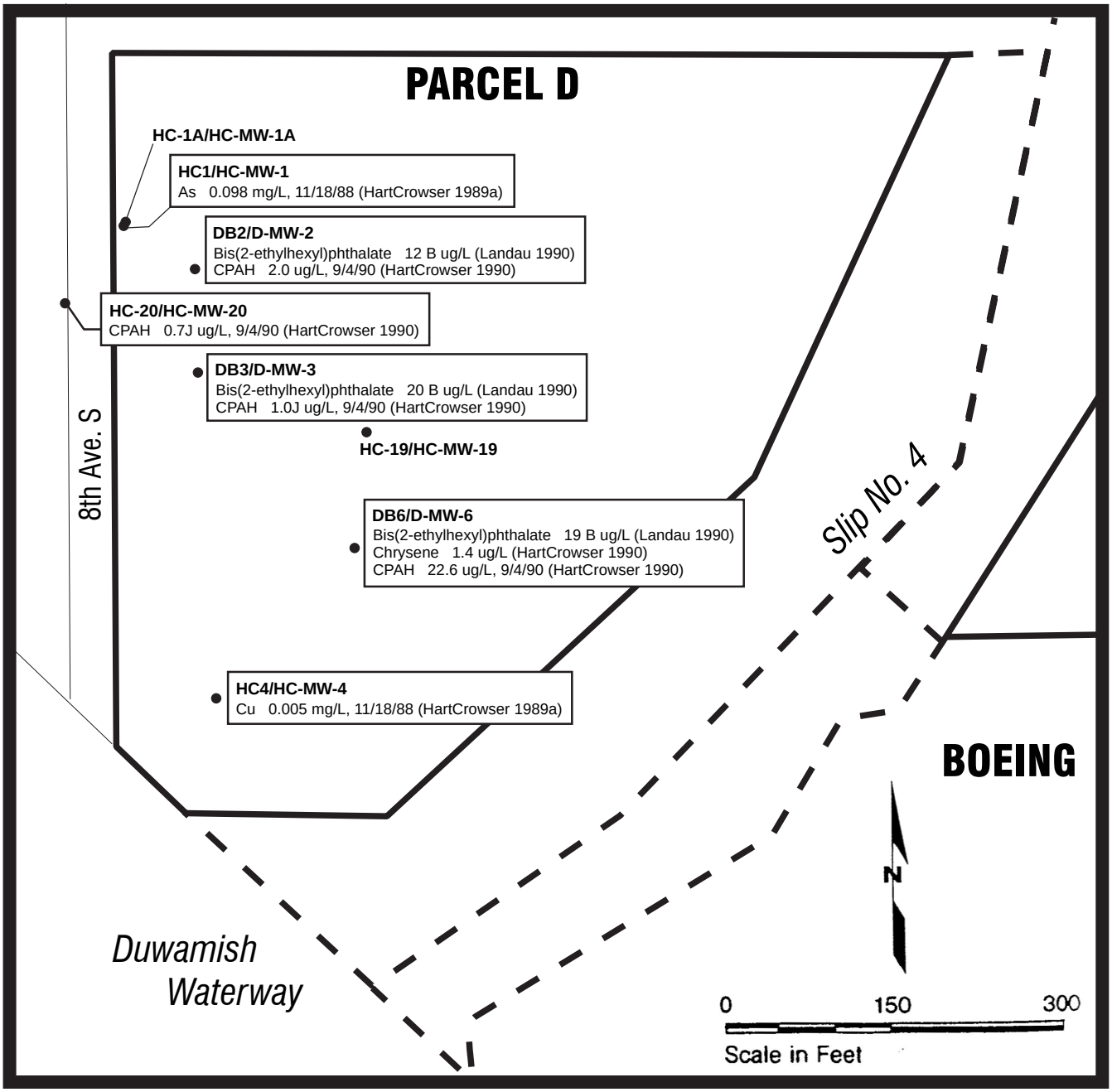


GJC @ 02-08-06

C:\GIS_projects\A0006_Lower-Duwamish_Various\ldw_slip-4-figures_8½x11-boxed-title-block_02-06-06.mxd

integral consulting inc.

Figure 2-13
Slip 4 - EE/CA
PCB Concentrations in Slip 4 Upland Samples Collected in 2005 From First South Properties
Lower Duwamish Waterway (LDW), Seattle, WA



B Possible/probable blank contamination
CPAH Sum of Carcinogenic Polyaromatic Hydrocarbons
J Estimated Concentration

Note: NOT TO SCALE. Locations shown are approximate.

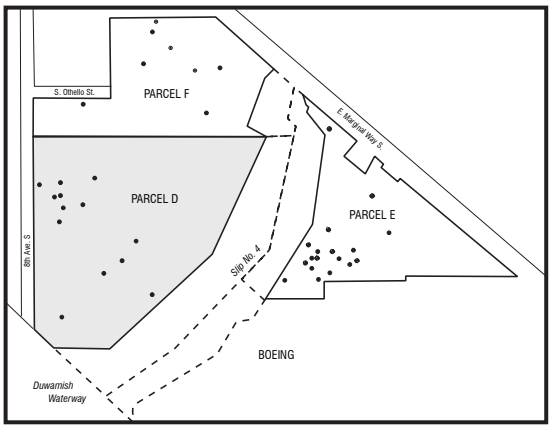
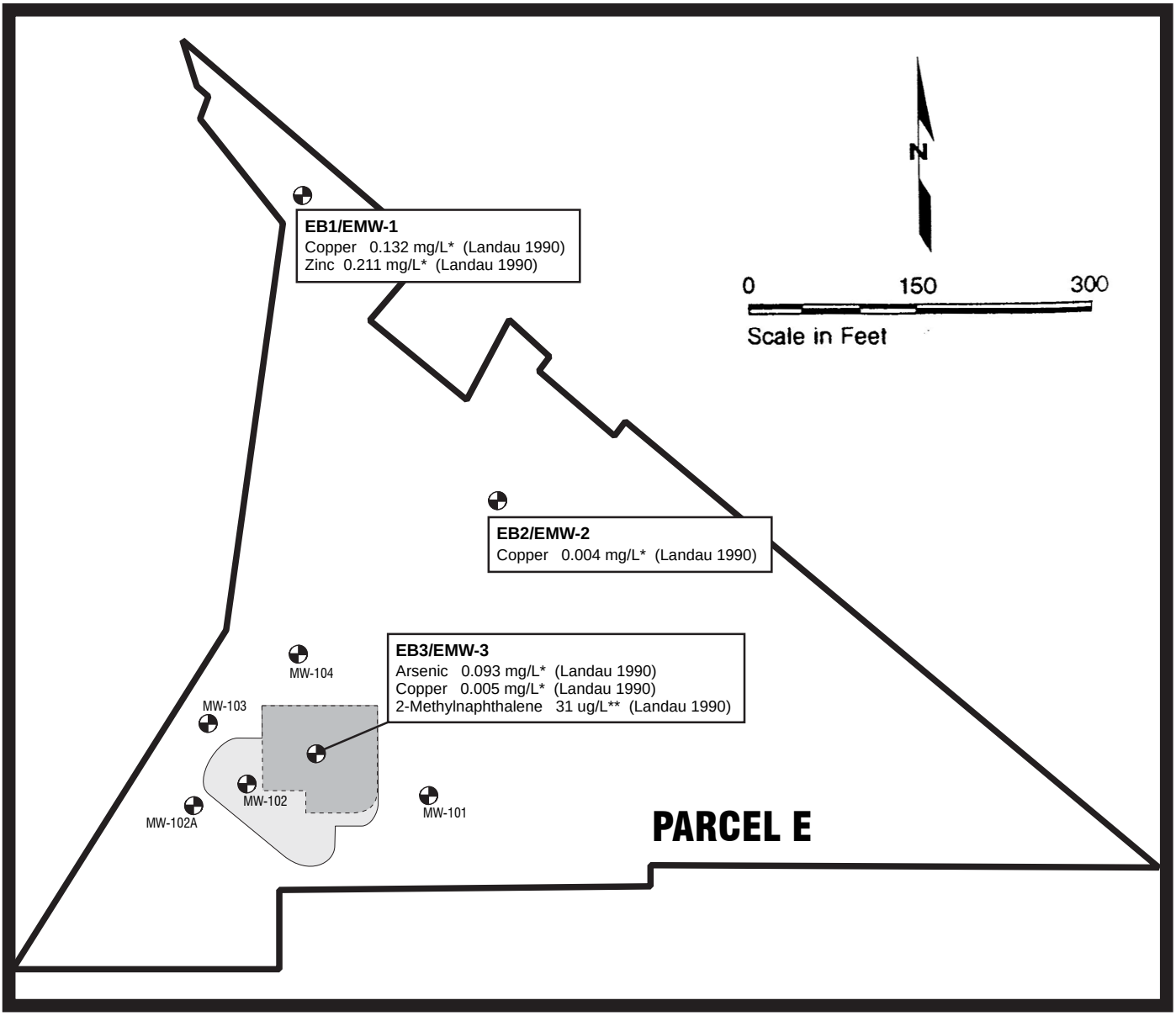


Figure 2-14. Parcel D Groundwater Exceedances of Surface Water Criteria Based on Most Recent Sampling. (modified from Hart Crowser 1990)



LEGEND

* Total metals concentration above dissolved metals criteria
** Calculated above MTCA criteria for protection of surface water (HartCrowser 1991)

Monitoring Well

EB1/EMW-1 Soil Boring ID/Monitoring Well ID

Extent of initial Hart Crowser (1991) excavation

Final extent of Hart Crowser (1996) excavation

Note: NOT TO SCALE.
Locations shown are approximate.

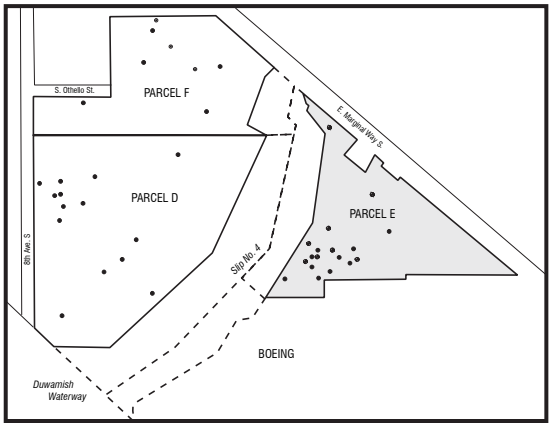
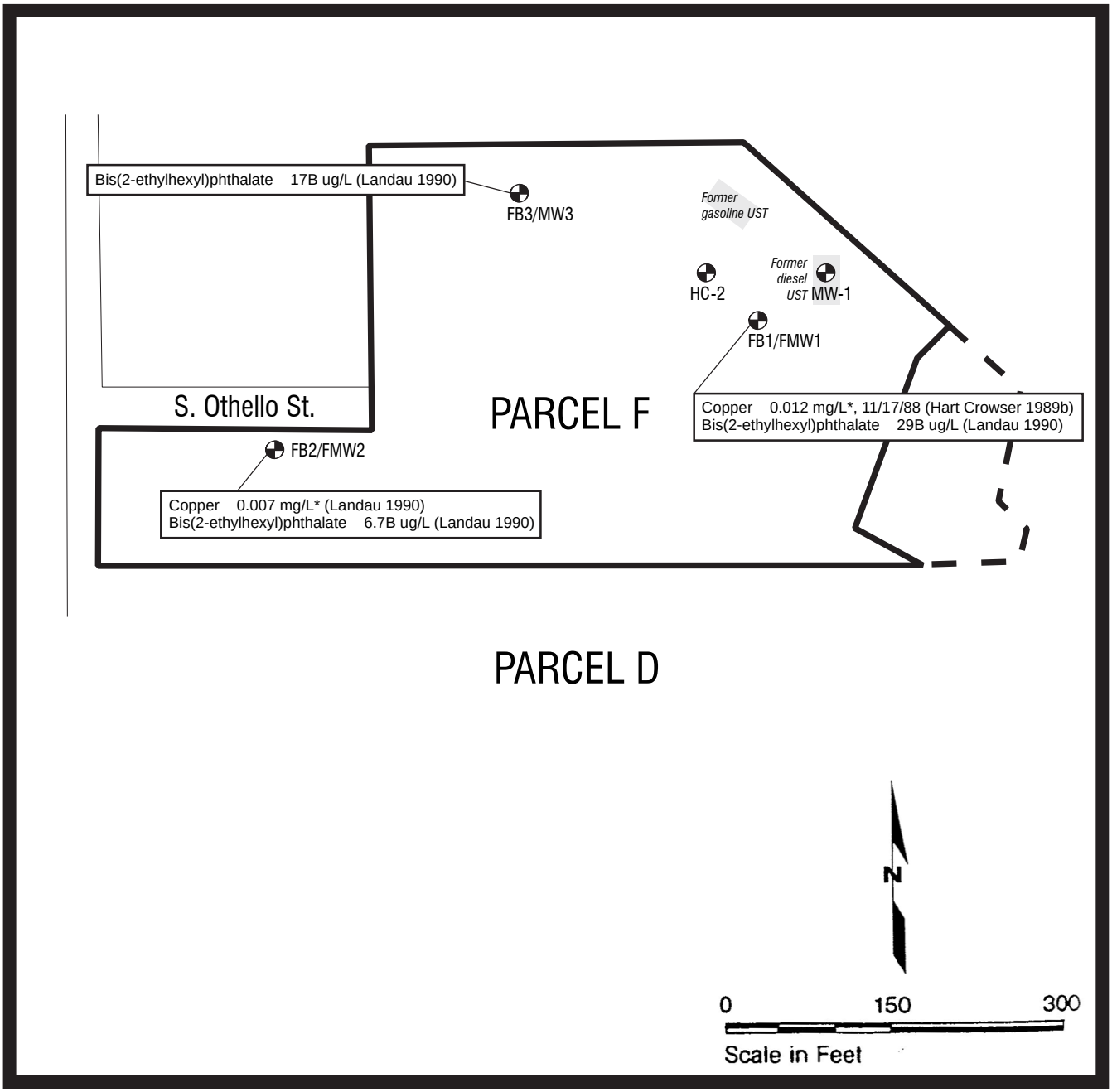


Figure 2-15. Parcel E Groundwater Exceedances of Surface Water Criteria Based on Most Recent Sampling. (Modified from Landau 1990 and Hart Crowser 1991, 1996)



LEGEND

Monitoring Well

FB1/FMW1 Soil Boring ID/Monitoring Well ID

* Total metals concentration above dissolved metal criteria

B Possible/probable blank contamination

Note: NOT TO SCALE. Locations shown are approximate.

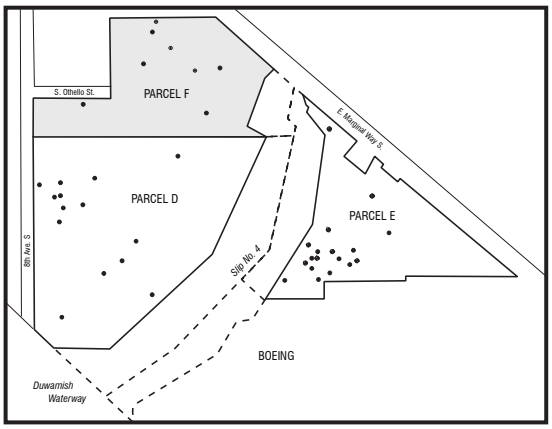
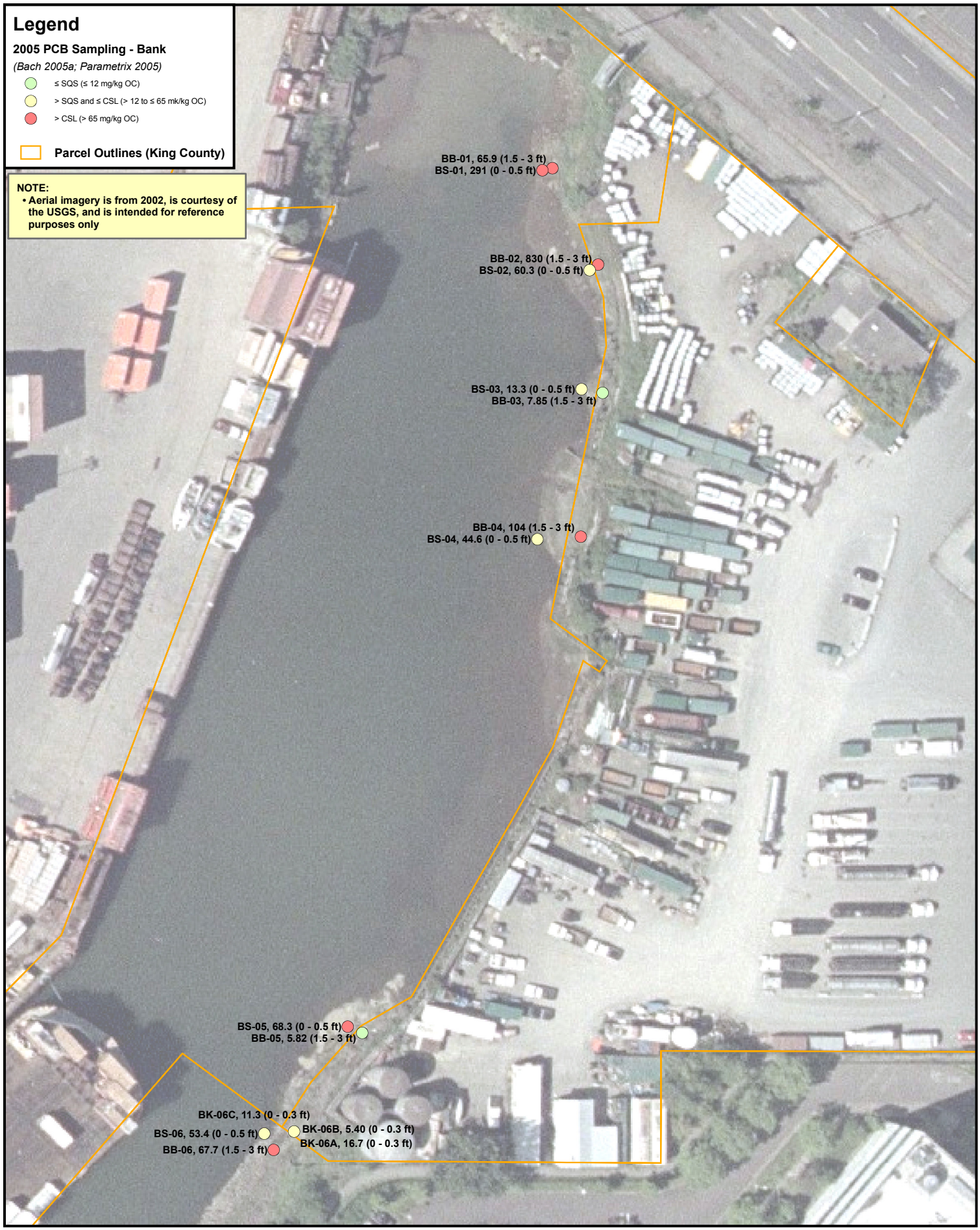


Figure 2-16. Parcel F Groundwater Exceedances of Surface Water Criteria Based on Most Recent Sampling. (modified from Hart Crowser 1989b and Landau 1990)



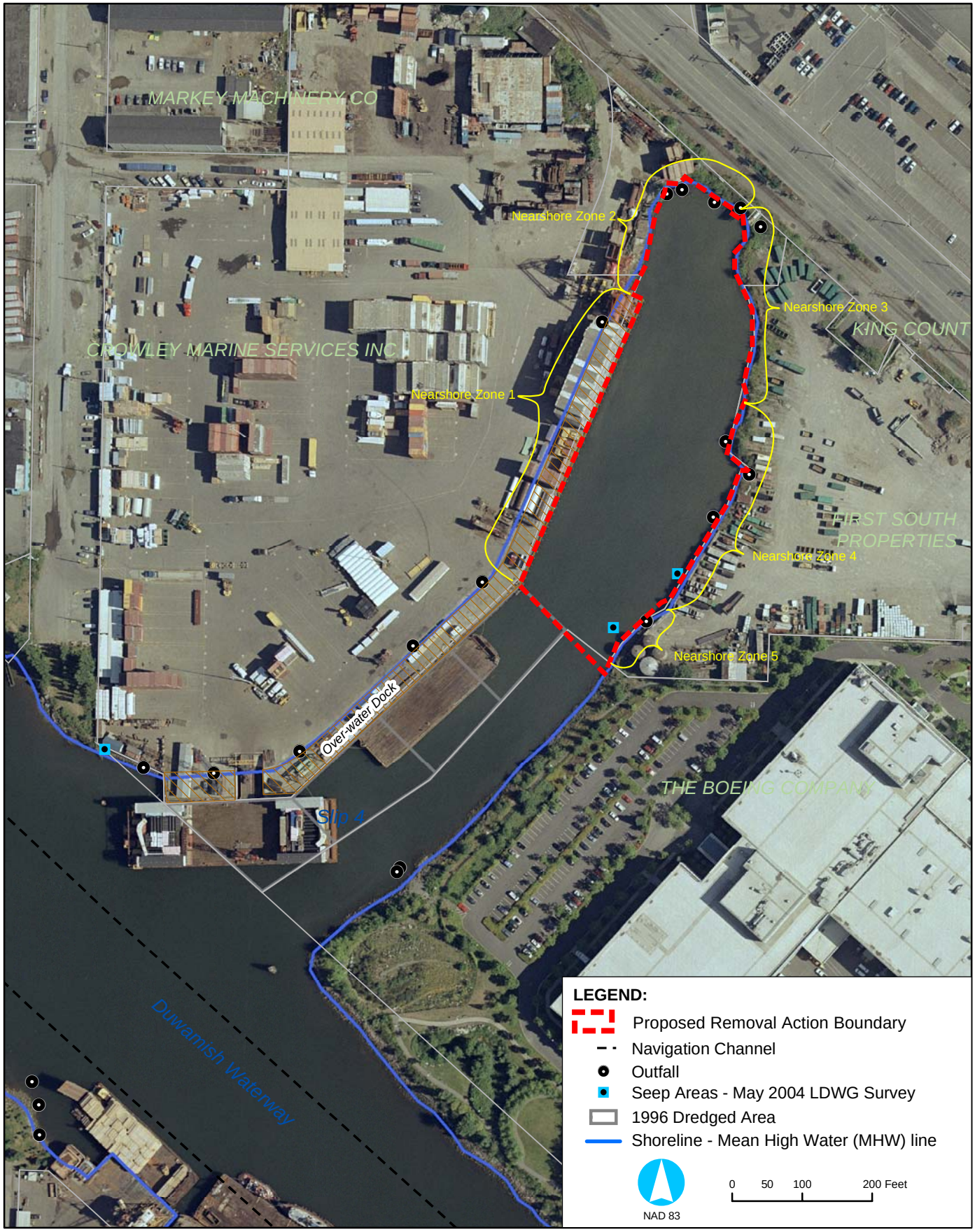
C:\GIS_projects\A0006_Lower-Duwamish_Various\ldw_slip-4-figures_8½x11-boxed-title-block_02-06-06.mxd GJC @ 02-08-06

integral consulting inc.

N

0 37.5 75 Feet

Figure 2-17
Slip 4 - EE/CA
PCB Concentrations in Slip 4 Bank Samples Collected in 2005 From First South Properties
Lower Duwamish Waterway (LDW), Seattle, WA



Map Document: (Q:\Projects\Duwamish_OLY\Projects\Slip4_EECA\Figure_2-17_Slip4_2004_Clean-up_Boundary_Map_Asize.mxd)
1/13/2006 -- 2:52:46 PM

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Sediment Chemistry:
Lower Duwamish Project Database and 2004 Slip 4 Survey PCB analysis results.

Figure 2-18
Slip 4 - EE/CA
Slip 4 Preliminary
Removal Action Boundary

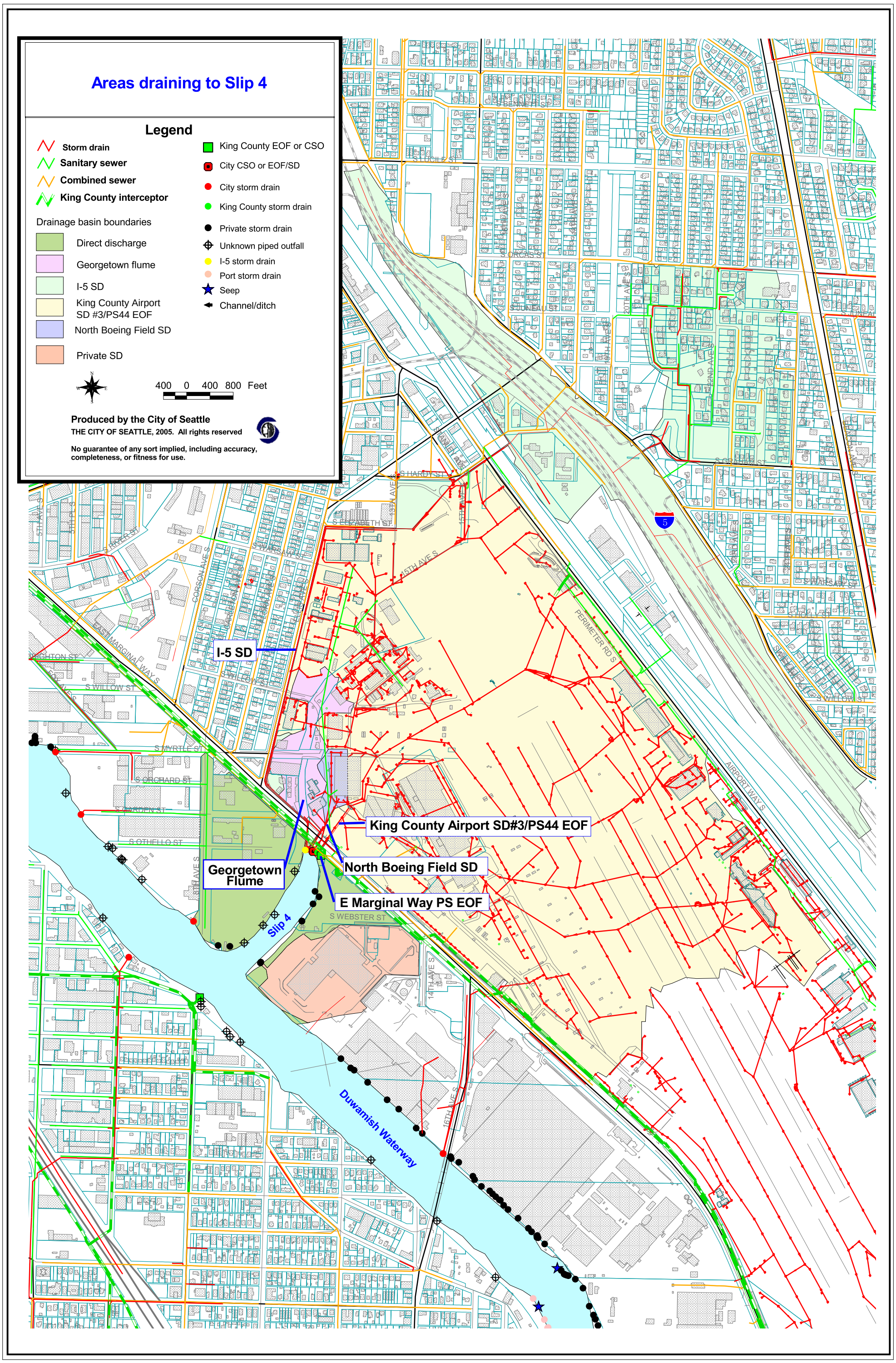
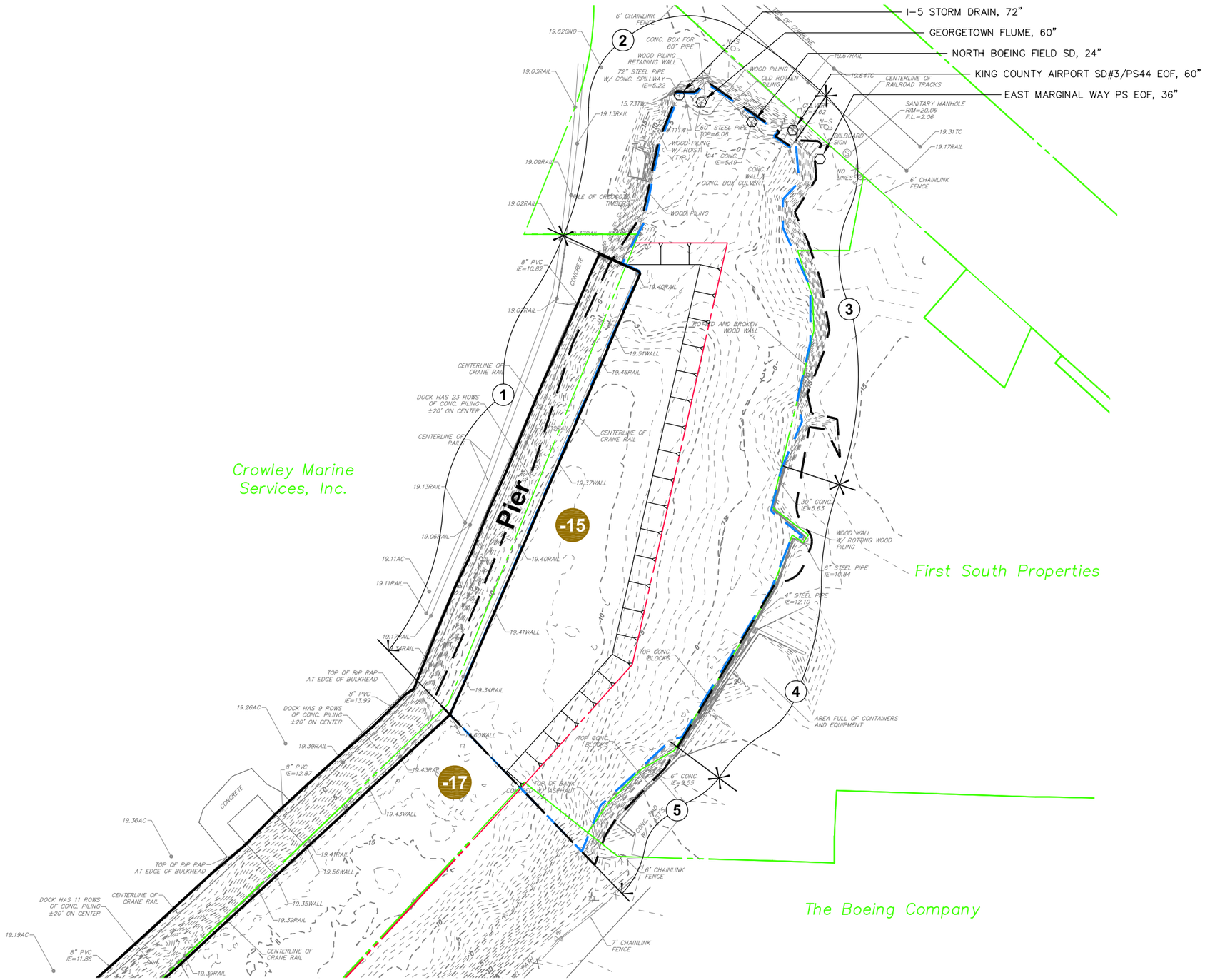


Figure 2-19. Areas Draining to Slip 4. (Figure provided by SPU.)

Map Document: (FG-Site Plans.dwg) - Layout: Removal Action Boundary and Shoreline Zones
2/7/2006 - 8:45:30 AM



LEGEND

- MAJOR OUTFALL
- POWER POLE
- SANITARY MANHOLE
- LUMINARE
- IRRIGATION CONTROL VALVE
- GUY WIRE
- 19.41WALL — SPOT ELEVATION
- 5-FOOT CONTOUR INTERVAL
- 1-FOOT CONTOUR INTERVAL
- PRELIMINARY REMOVAL BOUNDARY
- FINAL REMOVAL BOUNDARY
- APPROXIMATE PROPERTY LINE
- APPROXIMATE HISTORICAL (1981) DREDGE LIMITS
- 4 — SHORELINE ZONE
- -15 — DEEPEST HISTORICAL DREDGE DEPTH (FT, MLLW)

NOTES

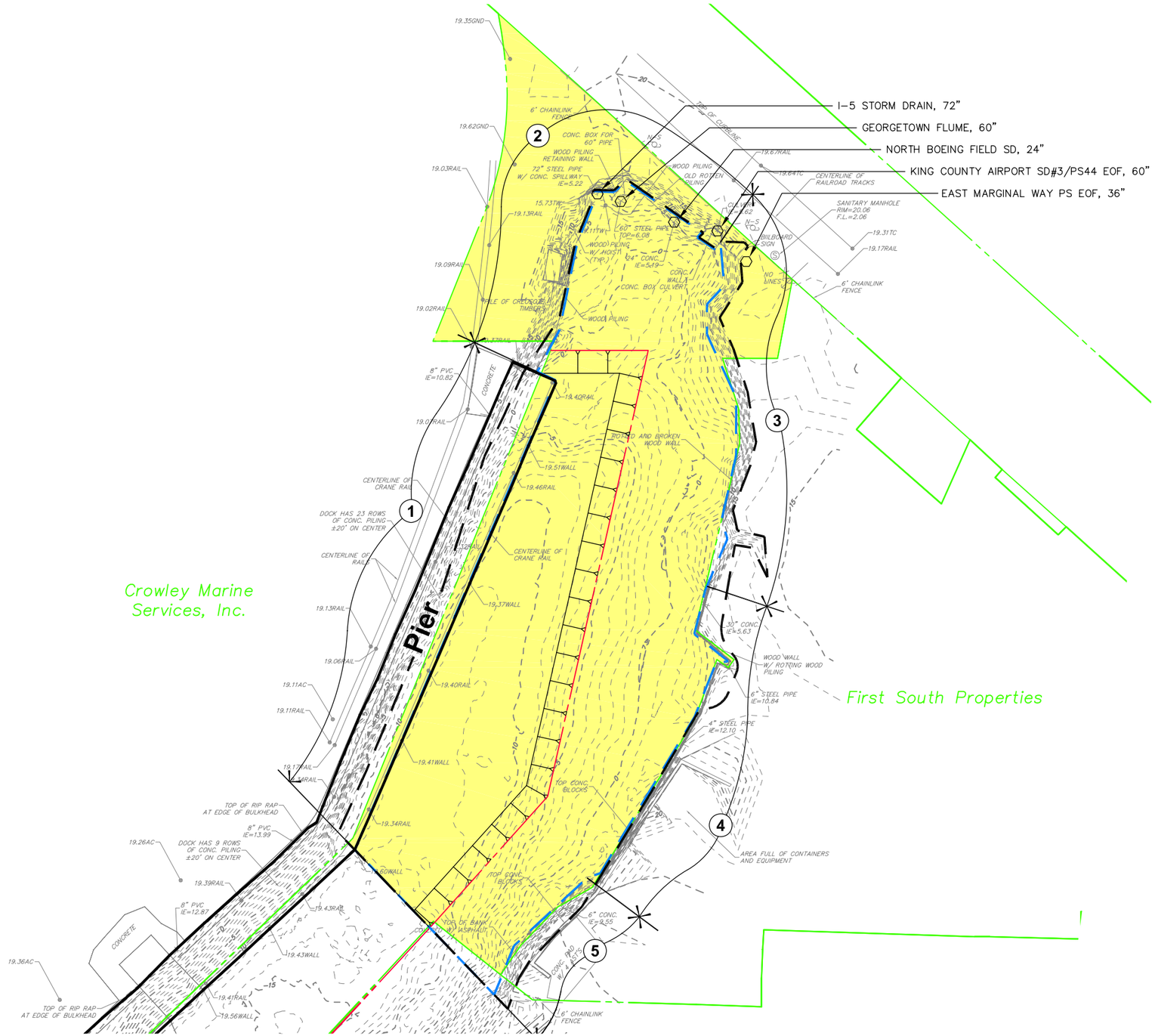
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD-83/91), U.S. FEET.
2. CONTOURS ARE SHOWN IN FEET AT AN INTERVAL OF 1 FOOT AND INDICATE ELEVATIONS IN REFERENCE TO MEAN LOWER LOW WATER (MLLW). THE BENCH MARK USED IS "DEA 2005" MLLW ELEVATION 16.17'.
3. TOPOGRAPHIC & HYDROGRAPHIC BASE INFORMATION PROVIDED BY MINISTER-GLAESER SURVEYING INC, 2200 E. EVERGREEN BLVD., VANCOUVER, WA 98661; MGS JOB#: 04-368; MGS DRAWING NAME: 04368T1.DWG. DATA COLLECTED: OCTOBER 5, 2004.
4. 1981 DREDGE LIMITS FROM MARINE POWER & EQUIPMENT DRAWINGS 071-0YB-2-006580 SHEET 2 OF 4, AND 533-YD5-42CP SHEET 1 OF 10.
5. PROPERTY BOUNDARIES FROM SEATTLE PUBLIC UTILITIES GIS.

N
NAD 83/91 WSPC NZ
0 50 100 Feet

integral consulting inc.

Figure 3-1
Removal Action Boundary, Shoreline Zones, and Historical Dredging
Slip 4 EE/CA

Map Document: (FG-Site Plans.dwg) - Layout: Land Purchase by City
2/7/2006 - 8:46:56 AM



LEGEND

- MAJOR OUTFALL
- POWER POLE
- SANITARY MANHOLE
- LUMINARE
- IRRIGATION CONTROL VALVE
- GUY WIRE
- 19.41WALL — SPOT ELEVATION
- 5-FOOT CONTOUR INTERVAL
- 1-FOOT CONTOUR INTERVAL
- PRELIMINARY REMOVAL BOUNDARY
- FINAL REMOVAL BOUNDARY
- APPROXIMATE PROPERTY LINE
- APPROXIMATE HISTORICAL (1981) DREDGE LIMITS
- (4) SHORELINE ZONE
- PRELIMINARY AREA OF PROPERTY PURCHASE BY CITY UNDER ALTERNATIVES 1 OR 2 (SEE NOTE 6)

NOTES

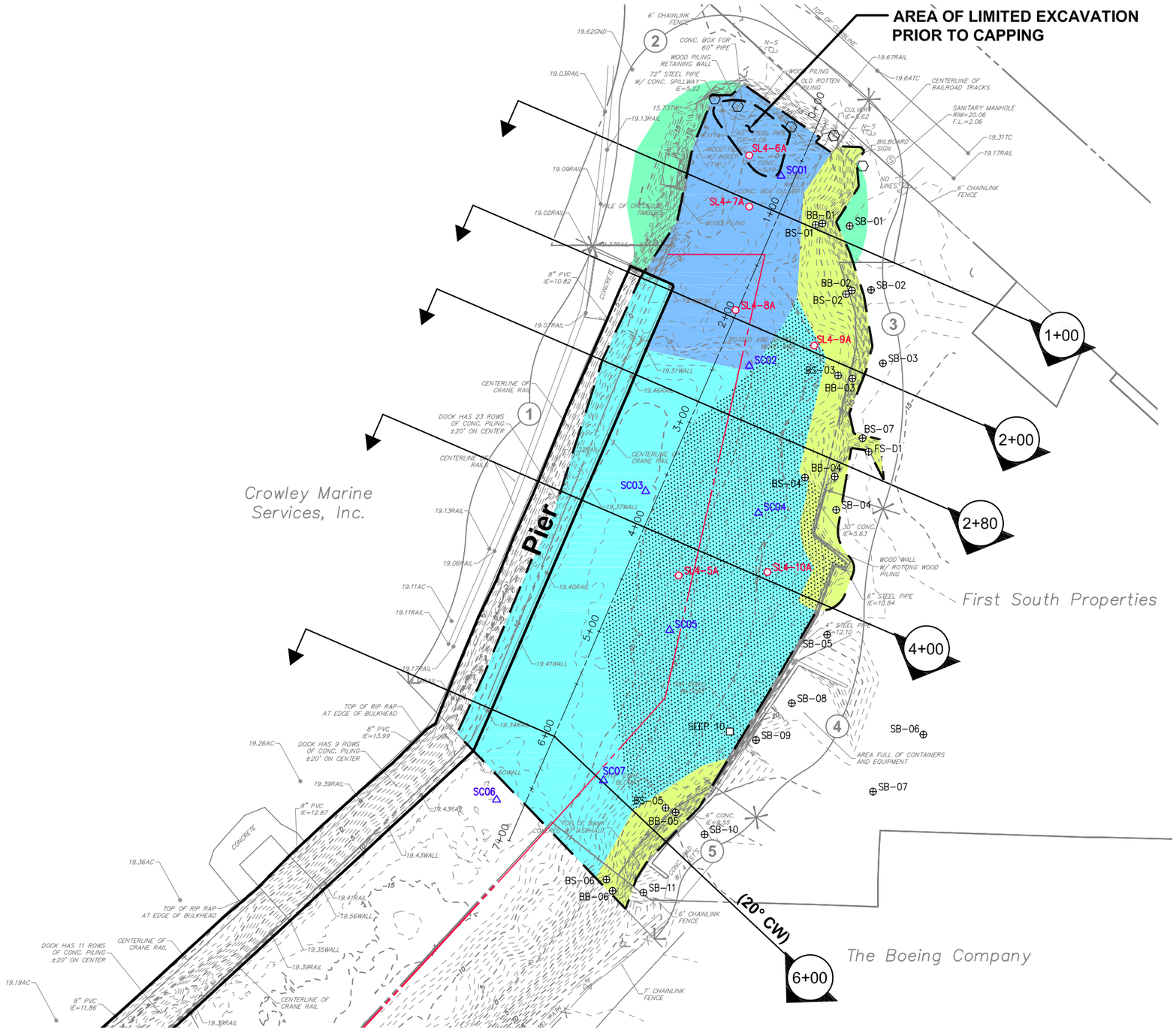
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD-83/91), U.S. FEET.
2. CONTOURS ARE SHOWN IN FEET AT AN INTERVAL OF 1 FOOT AND INDICATE ELEVATIONS IN REFERENCE TO MEAN LOWER LOW WATER (MLLW). THE BENCH MARK USED IS "DEA 2005" MLLW ELEVATION 16.17'.
3. TOPOGRAPHIC & HYDROGRAPHIC BASE INFORMATION PROVIDED BY MINISTER-GLAESER SURVEYING INC, 2200 E. EVERGREEN BLVD., VANCOUVER, WA 98661; MGS JOB#: 04-368; MGS DRAWING NAME: 04368T1.DWG. DATA COLLECTED: OCTOBER 5, 2004.
4. 1981 DREDGE LIMITS FROM MARINE POWER & EQUIPMENT DRAWINGS 071-0YB-2-006580 SHEET 2 OF 4, AND 533-YD5-42CP SHEET 1 OF 10.
5. PROPERTY BOUNDARIES FROM SEATTLE PUBLIC UTILITIES GIS.
6. LOT LINE ADJUSTMENTS MAY BE NEGOTIATED AS PART OF PURCHASE AGREEMENT - AREA SHOWN IS BASED ON EXISTING PROPERTY LINE INFORMATION.

N
NAD 83/91 WSPC NZ
0 50 100 Feet

integral consulting inc.

Figure 5-1
Land to be Purchased by the City
Under Alternatives 1 or 2
Slip 4 EE/CA

Map Document: (FG-Cross Sections.dwg) - Layout: Alt 1 - XSec Loc. Plan
2/7/2006 - 9:42:03 AM



LEGEND

- MAJOR OUTFALL
- POWER POLE
- SANITARY MANHOLE
- LUMINARE
- IRRIGATION CONTROL VALVE
- GUY WIRE
- 19.41WALL — SPOT ELEVATION
- 5-FOOT CONTOUR INTERVAL
- 1-FOOT CONTOUR INTERVAL
- FINAL REMOVAL BOUNDARY
- APPROXIMATE PROPERTY LINE
- APPROXIMATE HISTORICAL (1981) DREDGE LIMITS
- 1+00 — PROJECT BASELINE
- 4 — SHORELINE ZONE
- SEEP SAMPLE LOCATION
- SURFACE/SUBSURFACE SAMPLE LOCATION – ECOLOGY (2005)
- SUBSURFACE SAMPLE LOCATION – INTEGRAL (2004)
- SUBSURFACE SAMPLE LOCATION – LANDAU (1990)
- CAP WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- SLOPE CAP
- SAND/GRAVEL CAP
- HABITAT CREATION: FILL REMOVAL AND SLOPE COVER / SLOPE CAP
- HABITAT ENHANCEMENT: CAP THICKENED TO OPTIMIZE INTERTIDAL HABITAT

NOTES

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD-83/91), U.S. FEET.
2. CONTOURS ARE SHOWN IN FEET AT AN INTERVAL OF 1 FOOT AND INDICATE ELEVATIONS IN REFERENCE TO MEAN LOWER LOW WATER (MLLW). THE BENCH MARK USED IS "DEA 2005" MLLW ELEVATION 16.17'.
3. TOPOGRAPHIC & HYDROGRAPHIC BASE INFORMATION PROVIDED BY MINISTER-GLAESER SURVEYING INC, 2200 E. EVERGREEN BLVD., VANCOUVER, WA 98661; MGS JOB#: 04-368; MGS DRAWING NAME: 04368T1.DWG. DATA COLLECTED: OCTOBER 5, 2004.
4. 1981 DREDGE LIMITS FROM MARINE POWER & EQUIPMENT DRAWINGS 071-0YB-2-006580 SHEET 2 OF 4, AND 533-YD5-42CP SHEET 1 OF 10.
5. PROPERTY BOUNDARIES FROM SEATTLE PUBLIC UTILITIES GIS.

N
NAD 83/91 WSPC NZ
0 50 100 Feet

integral consulting inc.

Figure 5-2
Cross Section Location Plan
Alternative 1 - Capping and Habitat Enhancement
Slip 4 EE/CA

NOTES:

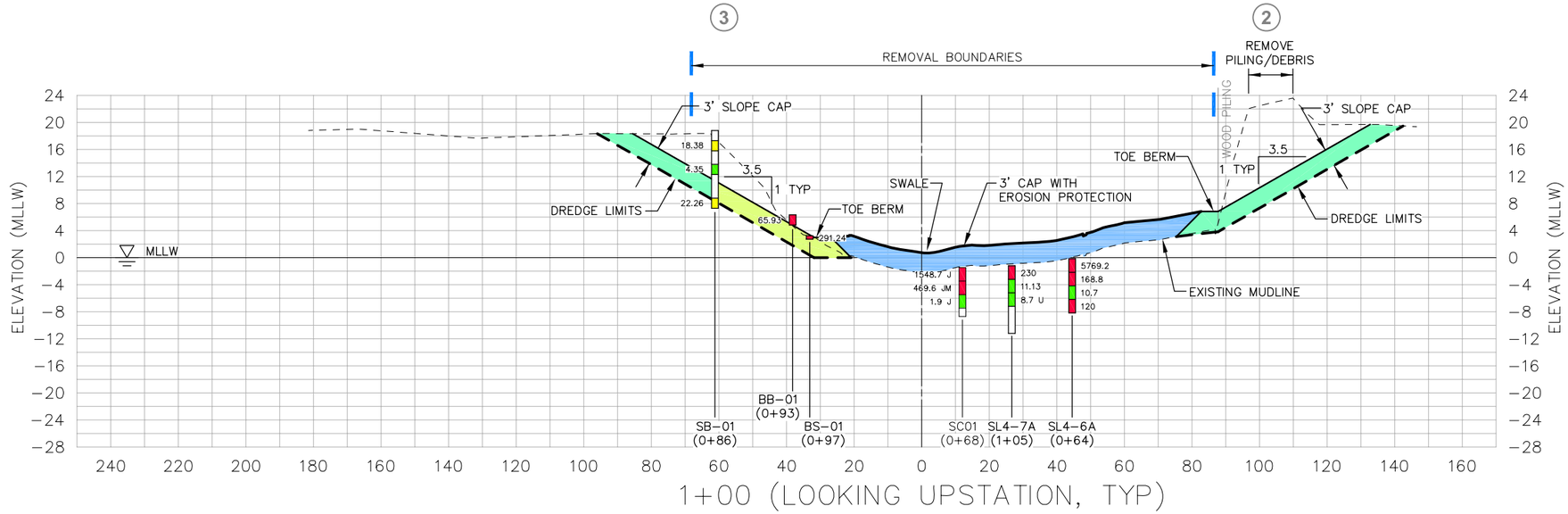
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.

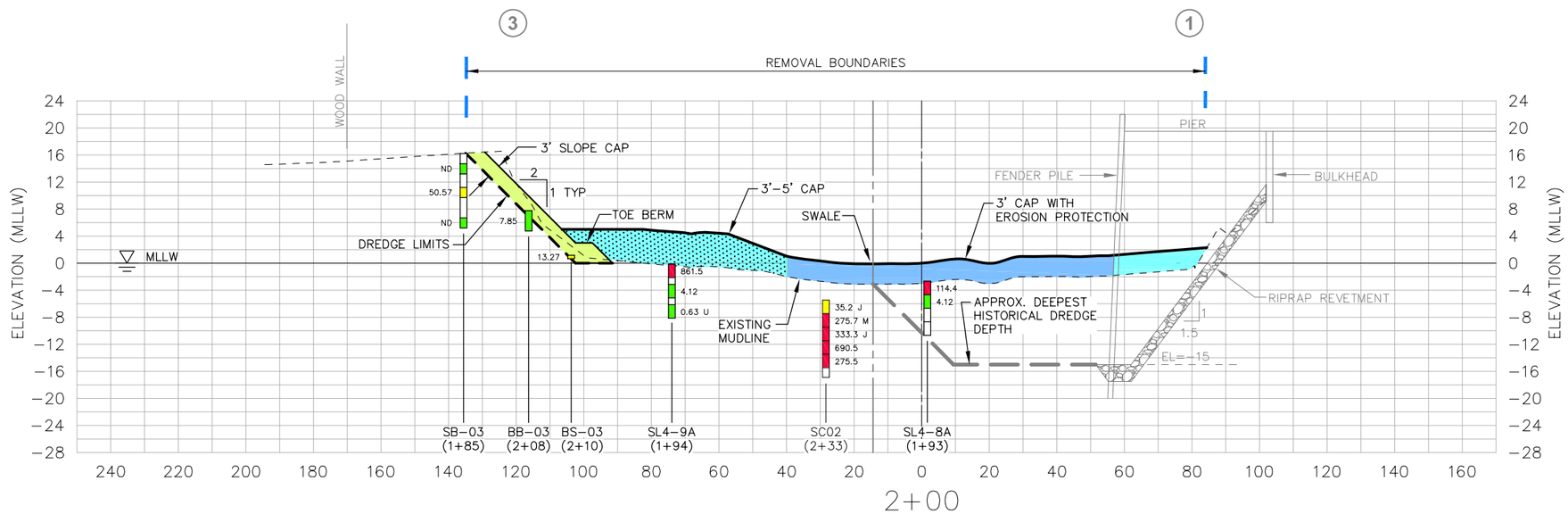
LEGEND:

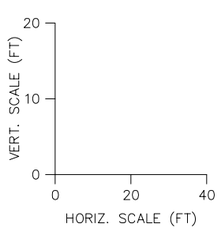
- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- CAP WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- SLOPE CAP
- SAND/GRAVEL CAP
- HABITAT CREATION: FILL REMOVAL AND SLOPE COVER / SLOPE CAP
- HABITAT ENHANCEMENT: CAP THICKENED TO OPTIMIZE INTERTIDAL HABITAT

CORE SAMPLES (SHOWN AT VERTICAL SCALE):

- Sample Total PCBs (mg/kg OC)
- 35.2 J, 275.7 M, 333.3 J, 690.5, 275.5
- Flag:
  - U = Undetected
  - J = Estimated
  - M = Mean of Field Duplicates (i.e., Split)
- < SQS (<=12 mg/kg OC)
- SQS to CSL (>12-65 mg/kg OC)
- > CSL (>65 mg/kg OC)
- Sample Not Taken (Landau 1990) or Not Analyzed (2004 Data)
- Core ID
- (2+33) SC02
- Core Station on Project Baseline







Map Document: (FG-Cross Sections.dwg) - Layout: Alt 1 - XSEC 1+00 & 2+00
2/7/2006 - 9:44:42 AM

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Figure 5-3
Cross Sections - Stations 1+00, 2+00
Alternative 1 - Capping and Habitat Enhancement
Slip 4 EE/CA

NOTES:

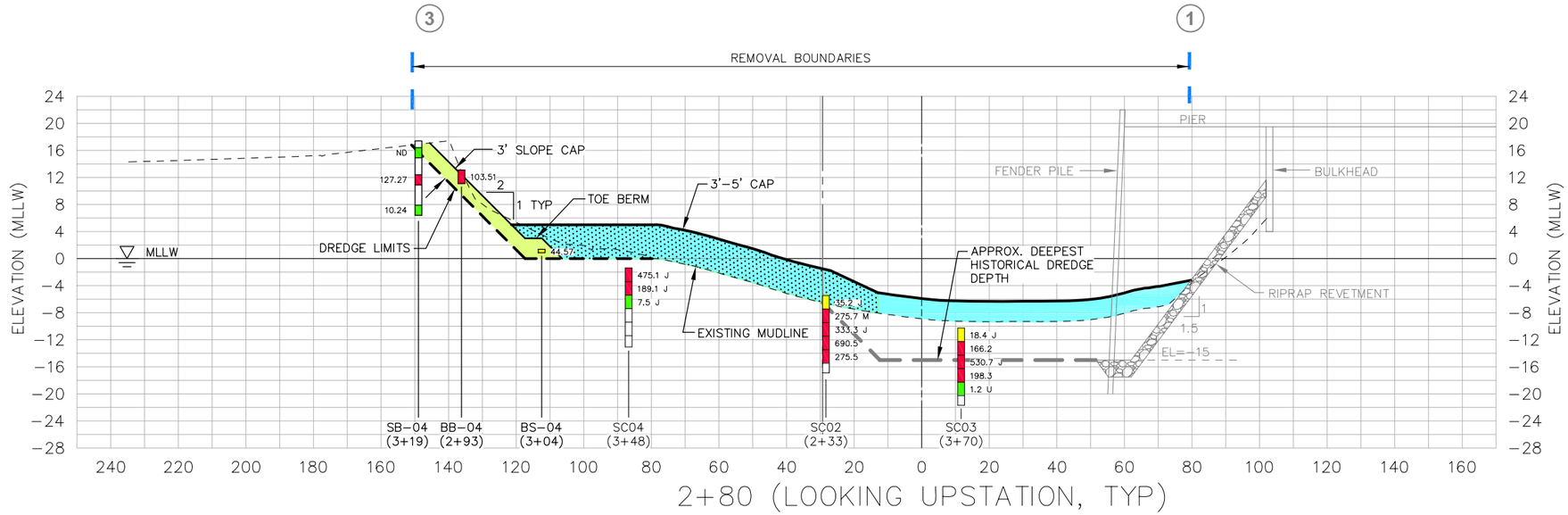
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.

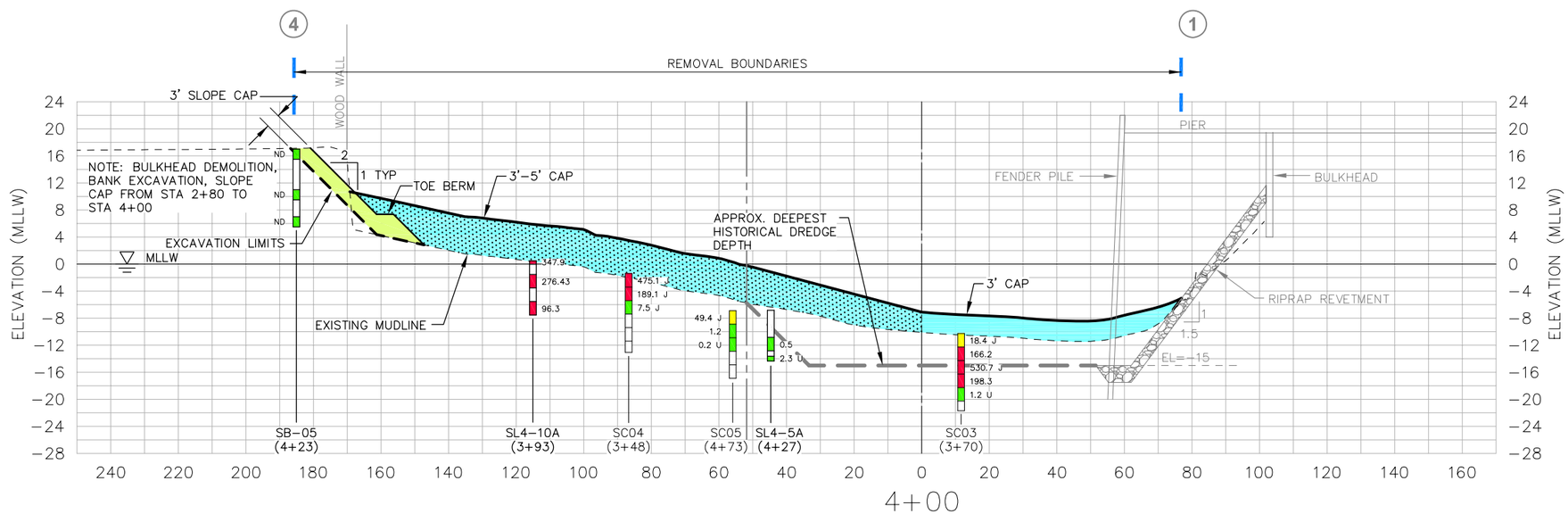
LEGEND:

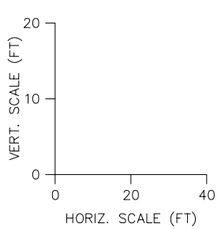
- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- CAP WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- SLOPE CAP
- SAND/GRAVEL CAP
- HABITAT CREATION: FILL REMOVAL AND SLOPE COVER / SLOPE CAP
- HABITAT ENHANCEMENT: CAP THICKENED TO OPTIMIZE INTERTIDAL HABITAT

CORE SAMPLES (SHOWN AT VERTICAL SCALE):

- Sample Total PCBs (mg/kg OC)
- Flag: U = Undetected; J = Estimated; M = Mean of Field Duplicates (i.e., Split)
- < SQS (<=12 mg/kg OC)
- SQS to CSL (>12-65 mg/kg OC)
- > CSL (>65 mg/kg OC)
- Sample Not Taken (Landau 1990) or Not Analyzed (2004 Data)
- Core ID
- Core Station on Project Baseline







Map Document: (FG-Cross Sections.dwg) - Layout: Alt 1 - XSEC 2+80 & 4+00
2/7/2006 - 9:45:12 AM

integral consulting inc.

Figure 5-4
Cross Sections - Stations 2+80, 4+00
Alternative 1 - Capping and Habitat Enhancement
Slip 4 EE/CA

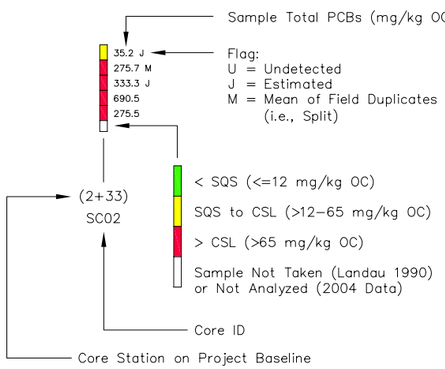
NOTES:

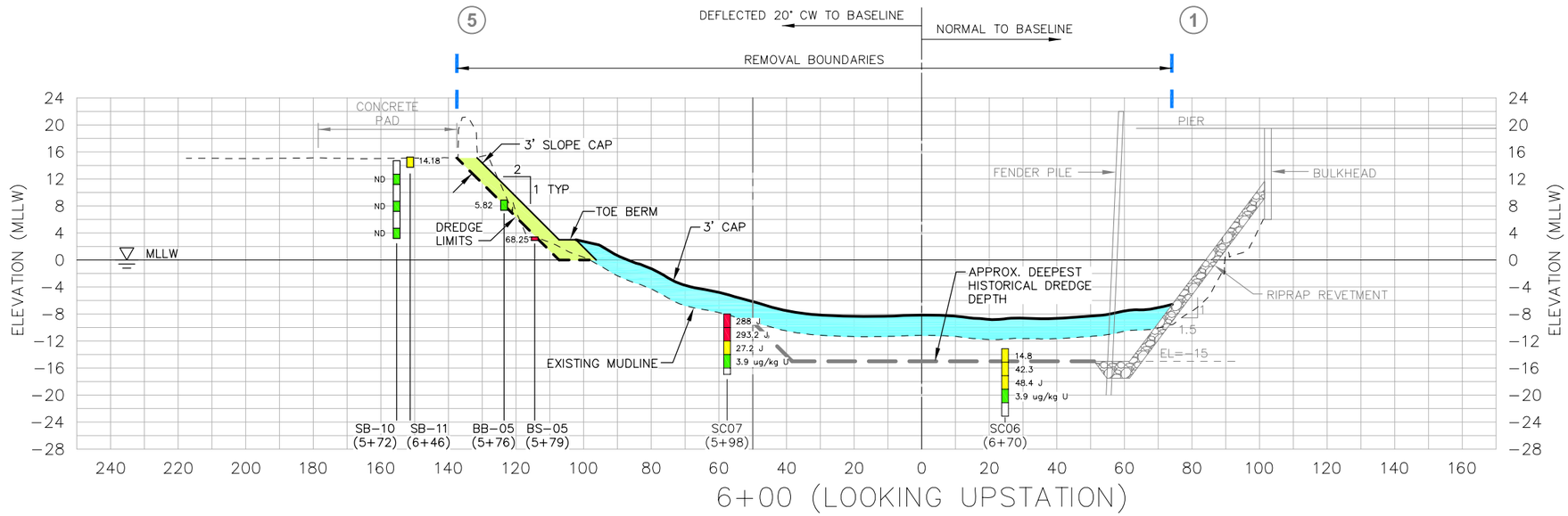
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.

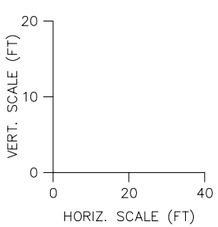
LEGEND:

- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- CAP WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- SLOPE CAP
- SAND/GRAVEL CAP
- HABITAT CREATION: FILL REMOVAL AND SLOPE COVER / SLOPE CAP
- HABITAT ENHANCEMENT: CAP THICKENED TO OPTIMIZE INTERTIDAL HABITAT

CORE SAMPLES (SHOWN AT VERTICAL SCALE):







Map Document: (FG-Cross Sections.dwg) - Layout: Alt 1 - XSEC 6+00
2/7/2006 - 9:46:08 AM

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Figure 5-5
Cross Section - Station 6+00
Alternative 1 - Capping and Habitat Enhancement
Slip 4 EE/CA

Map Document: (FG-Cross Sections.dwg) - Layout: Alt 2 - XSec Loc. Plan
2/7/2006 - 9:46:38 AM

LEGEND

- MAJOR OUTFALL
- POWER POLE
- SANITARY MANHOLE
- LUMINARE
- IRRIGATION CONTROL VALVE
- GUY WIRE
- 19.41WALL — SPOT ELEVATION
- 5-FOOT CONTOUR INTERVAL
- 1-FOOT CONTOUR INTERVAL
- FINAL REMOVAL BOUNDARY
- APPROXIMATE PROPERTY LINE
- APPROXIMATE HISTORICAL (1981) DREDGE LIMITS
- 1+00 — PROJECT BASELINE
- 4 — SHORELINE ZONE
- SEEP SAMPLE LOCATION
- SURFACE/SUBSURFACE SAMPLE LOCATION – ECOLOGY (2005)
- SUBSURFACE SAMPLE LOCATION – INTEGRAL (2004)
- SUBSURFACE SAMPLE LOCATION – LANDAU (1990)
- DREDGE 3–6 FEET. CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- SLOPE CAP
- SAND/GRAVEL CAP
- HABITAT CREATION: FILL REMOVAL AND SLOPE COVER / SLOPE CAP
- HABITAT ENHANCEMENT: CAP THICKENED TO OPTIMIZE INTERTIDAL HABITAT

NOTES

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD–83/91), U.S. FEET.
2. CONTOURS ARE SHOWN IN FEET AT AN INTERVAL OF 1 FOOT AND INDICATE ELEVATIONS IN REFERENCE TO MEAN LOWER LOW WATER (MLLW). THE BENCH MARK USED IS "DEA 2005" MLLW ELEVATION 16.17'.
3. TOPOGRAPHIC & HYDROGRAPHIC BASE INFORMATION PROVIDED BY MINISTER–GLAESER SURVEYING INC, 2200 E. EVERGREEN BLVD., VANCOUVER, WA 98661; MGS JOB#: 04–368; MGS DRAWING NAME: 04368T1.DWG. DATA COLLECTED: OCTOBER 5, 2004.
4. 1981 DREDGE LIMITS FROM MARINE POWER & EQUIPMENT DRAWINGS 071–0YB–2–006580 SHEET 2 OF 4, AND 533–YD5–42CP SHEET 1 OF 10.
5. PROPERTY BOUNDARIES FROM SEATTLE PUBLIC UTILITIES GIS.

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Figure 5-6
Cross Section Location Plan
Alternative 2 - Capping, Targeted Sediment Removal, and Habitat Enhancement
Slip 4 EE/CA

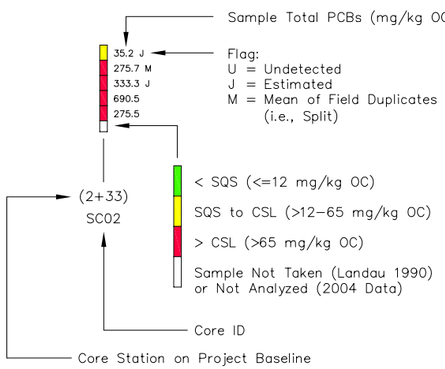
NOTES:

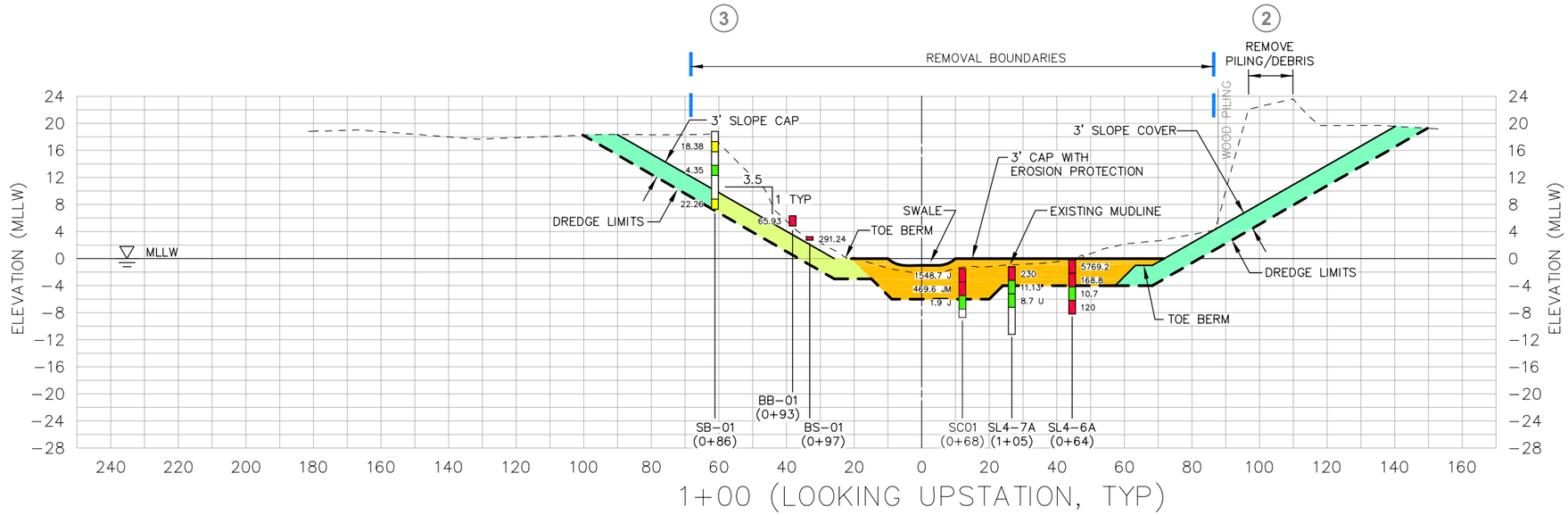
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.

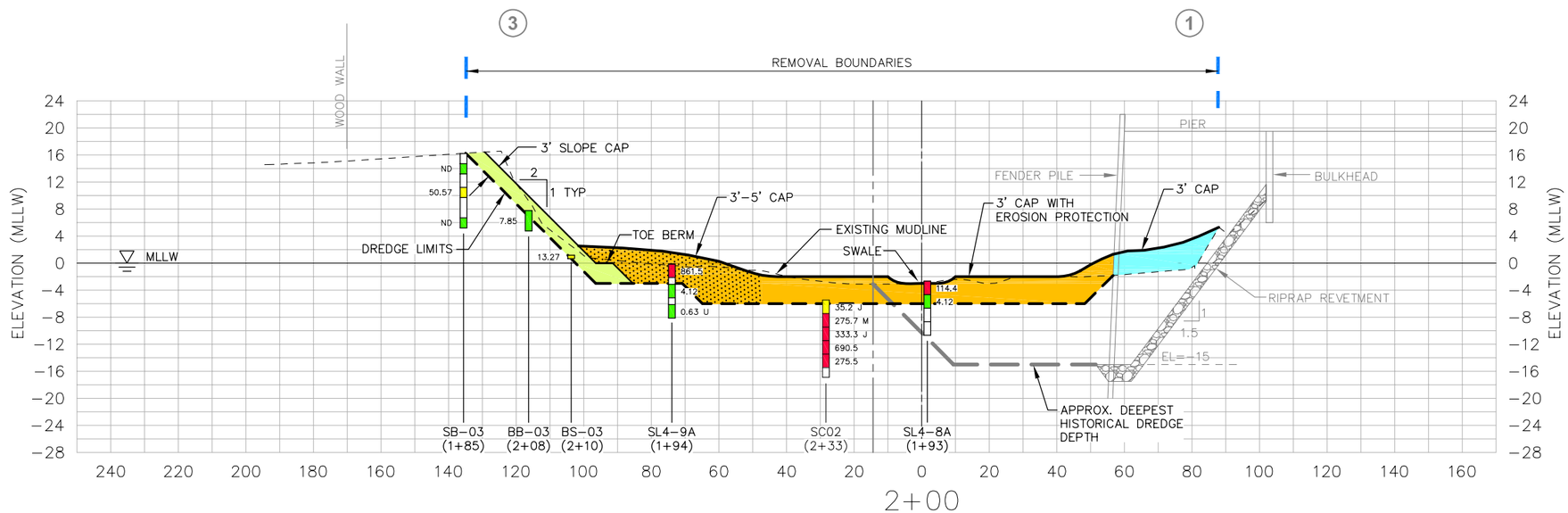
LEGEND:

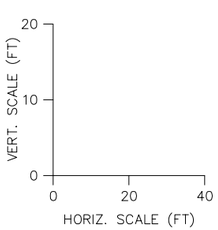
- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE 3-6 FEET. CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- SLOPE CAP
- SAND/GRAVEL CAP
- HABITAT CREATION: FILL REMOVAL AND SLOPE COVER / SLOPE CAP
- HABITAT ENHANCEMENT: CAP THICKENED TO OPTIMIZE INTERTIDAL HABITAT

CORE SAMPLES (SHOWN AT VERTICAL SCALE):









Map Document: (FG-Cross Sections.dwg) - Layout: Alt 2 - XSEC 1+00 & 2+00
2/7/2006 - 9:47:18 AM

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Figure 5-7
Cross Sections - Stations 1+00, 2+00
Alternative 2 - Capping, Targeted Sediment Removal, and Habitat Enhancement
Slip 4 EE/CA

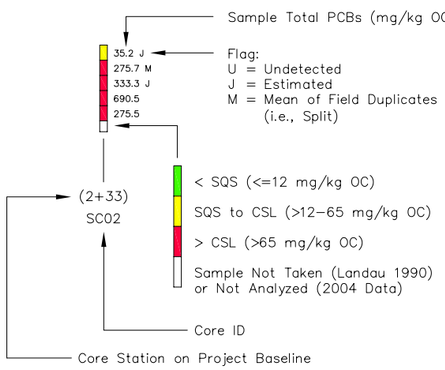
NOTES:

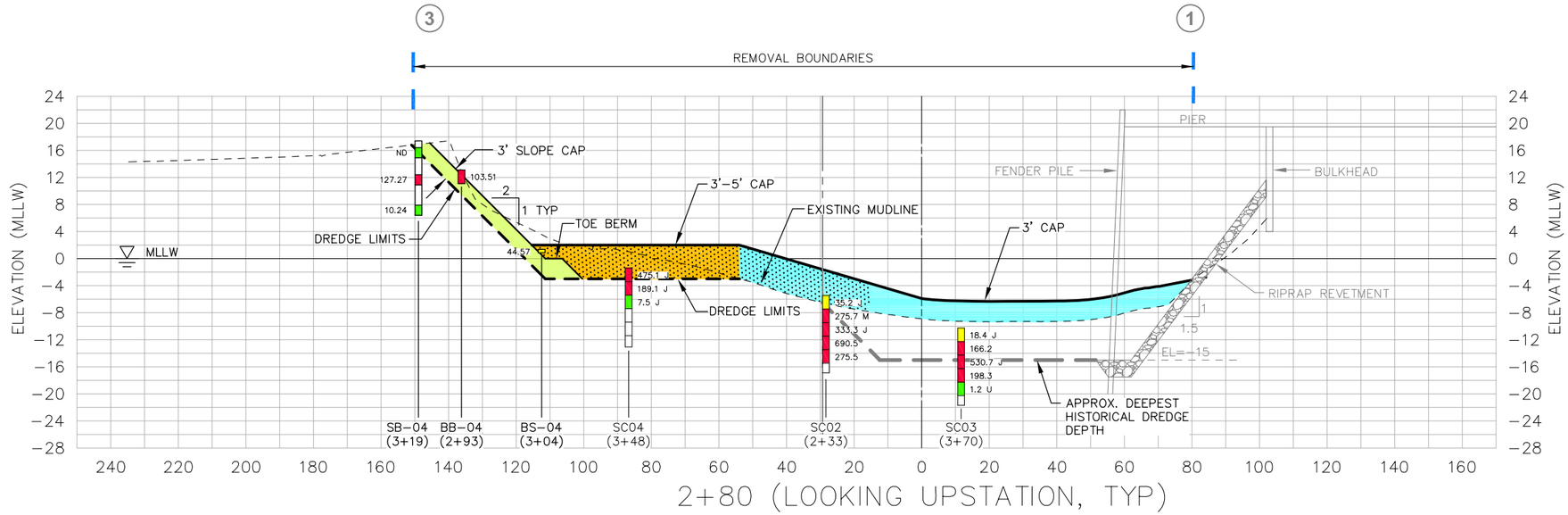
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.

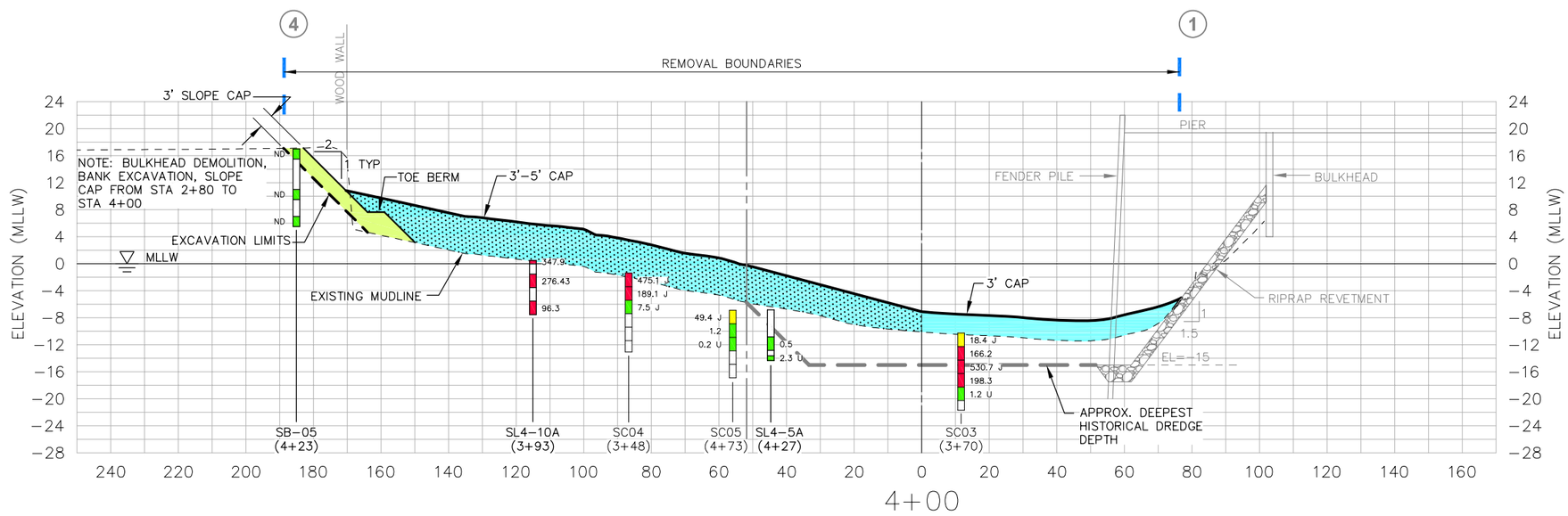
LEGEND:

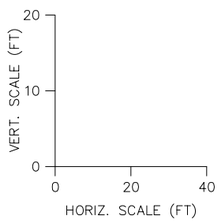
- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE 3-6 FEET. CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- SLOPE CAP
- SAND/GRAVEL CAP
- HABITAT CREATION: FILL REMOVAL AND SLOPE COVER / SLOPE CAP
- HABITAT ENHANCEMENT: CAP THICKENED TO OPTIMIZE INTERTIDAL HABITAT

CORE SAMPLES (SHOWN AT VERTICAL SCALE):









Map Document: (FG-Cross Sections.dwg) - Layout: Alt 2 - XSEC 2+80 & 4+00
2/7/2006 - 9:47:46 AM

integral consulting inc.

Figure 5-8
Cross Sections - Stations 2+80, 4+00
Alternative 2 - Capping, Targeted Sediment Removal, and Habitat Enhancement
Slip 4 EE/CA

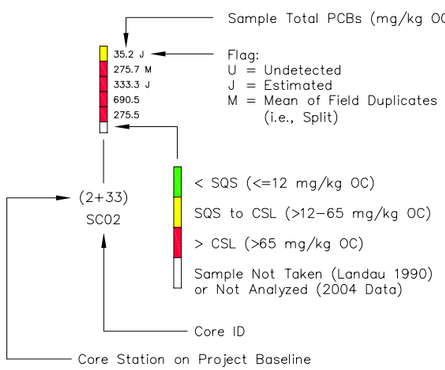
NOTES:

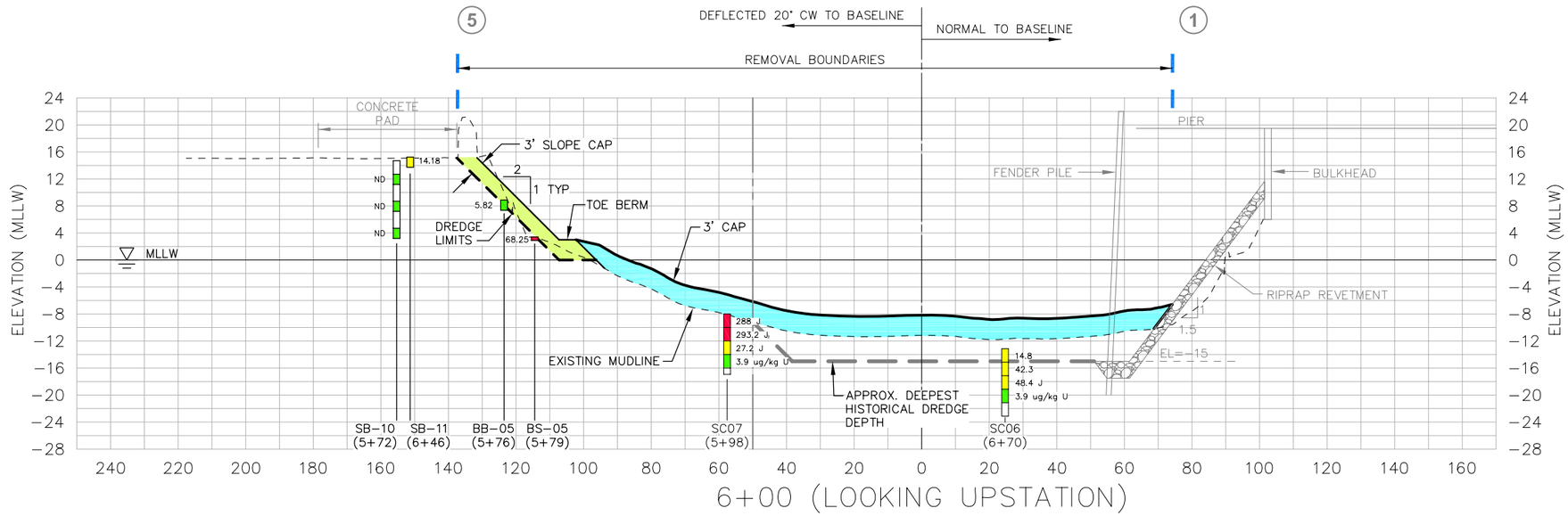
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.

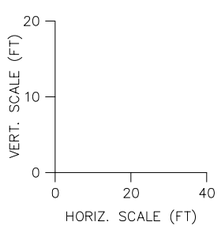
LEGEND:

- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE 3-6 FEET. CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- SLOPE CAP
- SAND/GRAVEL CAP
- HABITAT CREATION: FILL REMOVAL AND SLOPE COVER / SLOPE CAP
- HABITAT ENHANCEMENT: CAP THICKENED TO OPTIMIZE INTERTIDAL HABITAT

CORE SAMPLES (SHOWN AT VERTICAL SCALE):







Map Document: (FG-Cross Sections.dwg) - Layout: Alt 2 - XSEC 6+00
2/7/2006 - 9:48:19 AM

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Figure 5-9
Cross Section - Station 6+00
Alternative 2 - Capping, Targeted Sediment Removal, and Habitat Enhancement
Slip 4 EE/CA

Map Document: (FG-Cross Sections.dwg) - Layout: Alt 3 - XSec Loc. Plan
2/7/2006 - 9:28:31 AM

LEGEND

- MAJOR OUTFALL
- POWER POLE
- SANITARY MANHOLE
- LUMINARE
- IRRIGATION CONTROL VALVE
- GUY WIRE
- 19.41WALL — SPOT ELEVATION
- 5-FOOT CONTOUR INTERVAL
- 1-FOOT CONTOUR INTERVAL
- FINAL REMOVAL BOUNDARY
- APPROXIMATE PROPERTY LINE
- APPROXIMATE HISTORICAL (1981) DREDGE LIMITS
- 1+00 — PROJECT BASELINE
- 4 — SHORELINE ZONE
- SEEP SAMPLE LOCATION
- SURFACE/SUBSURFACE SAMPLE LOCATION – ECOLOGY (2005)
- SUBSURFACE SAMPLE LOCATION – INTEGRAL (2004)
- SUBSURFACE SAMPLE LOCATION – LANDAU (1990)
- DREDGE TO DESIGN ELEVATION (REMOVING 3-6 FEET – SEE NOTE 6). CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- DREDGE TO DESIGN ELEVATION (NO BACKFILL) (–16 FEET MLLW OR DEEPER – SEE NOTE 6)
- SLOPE CAP
- UNDER-PIER SLOPE CAP
- CAP WITH EROSION PROTECTION

NOTES

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD-83/91), U.S. FEET.
2. CONTOURS ARE SHOWN IN FEET AT AN INTERVAL OF 1 FOOT AND INDICATE ELEVATIONS IN REFERENCE TO MEAN LOWER LOW WATER (MLLW). THE BENCH MARK USED IS "DEA 2005" MLLW ELEVATION 16.17'.
3. TOPOGRAPHIC & HYDROGRAPHIC BASE INFORMATION PROVIDED BY MINISTER-GLAESER SURVEYING INC, 2200 E. EVERGREEN BLVD., VANCOUVER, WA 98661; MGS JOB#: 04-368; MGS DRAWING NAME: 04368T1.DWG. DATA COLLECTED: OCTOBER 5, 2004.
4. 1981 DREDGE LIMITS FROM MARINE POWER & EQUIPMENT DRAWINGS 071-0YB-2-006580 SHEET 2 OF 4, AND 533-YD5-42CP SHEET 1 OF 10.
5. PROPERTY BOUNDARIES FROM SEATTLE PUBLIC UTILITIES GIS.
6. DREDGE ELEVATIONS TO BE DETERMINED IN DESIGN.

N

NAD 83/91 WSPC NZ

0 50 100 Feet

integral consulting inc.

Figure 5-10
Cross Section Location Plan
Alternative 3 - Inner Berth Sediment Removal and Capping
Slip 4 EE/CA

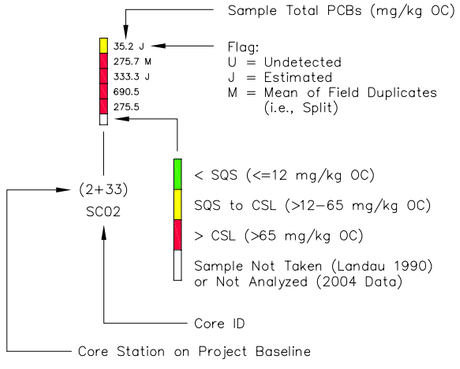
NOTES:

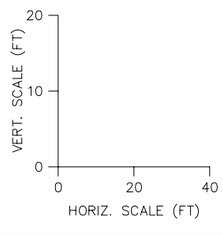
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.
2. DREDGE ELEVATIONS TO BE DETERMINED IN DESIGN.
3. DREDGE ELEVATIONS IN INNER BERTH TO BE DETERMINED IN DESIGN. CONFIRMATION SAMPLING AND CONTINGENCY ACTIONS TO ENSURE FINAL SURFACE MEETS SQS.

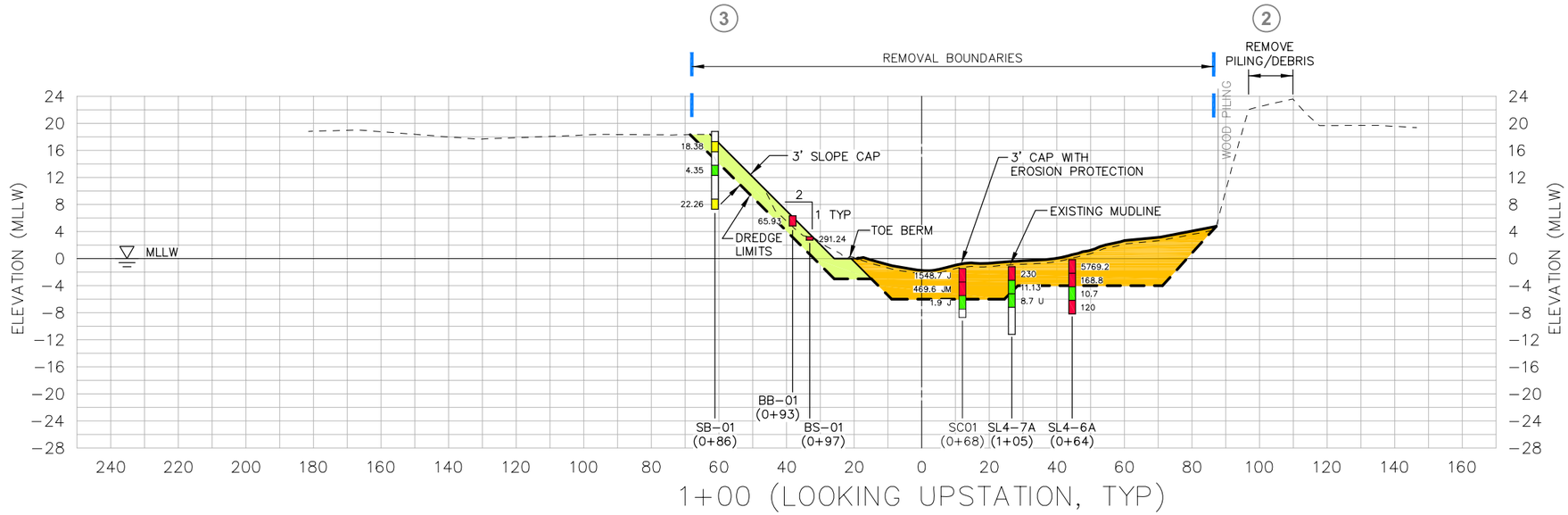
LEGEND:

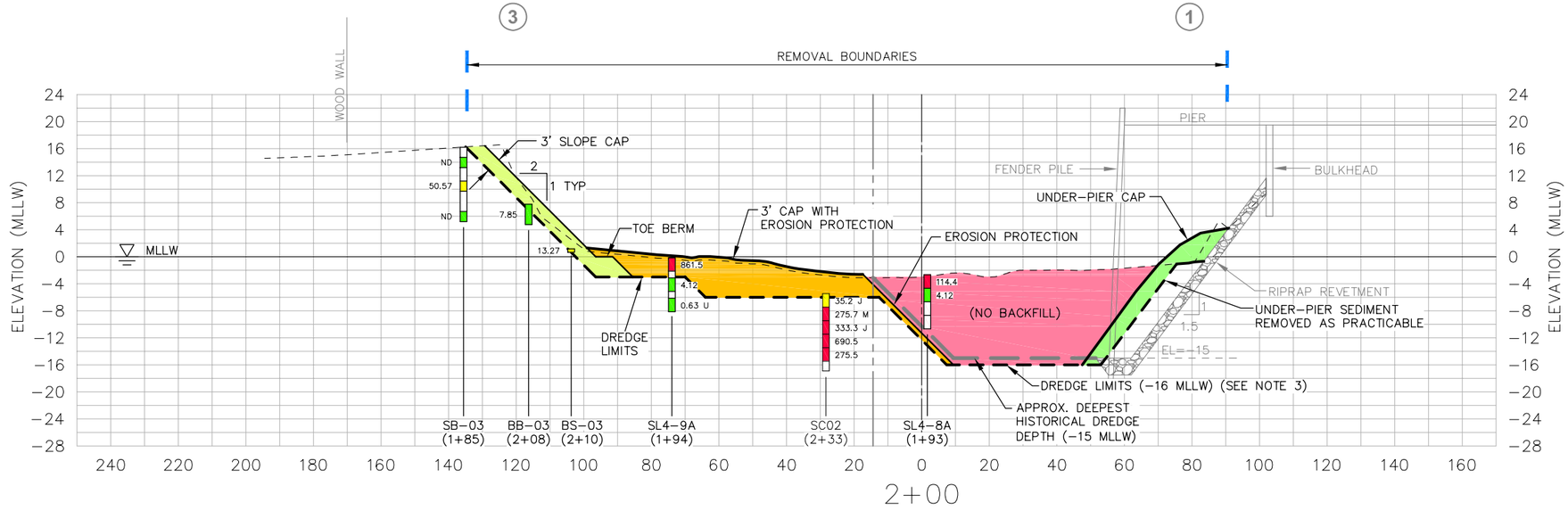
- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE TO DESIGN ELEVATION (REMOVING 3-6 FEET - SEE NOTE 2). CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- DREDGE TO DESIGN ELEVATION (NO BACKFILL) (SEE NOTE 3)
- SLOPE CAP
- UNDER-PIER SLOPE CAP
- CAP WITH EROSION PROTECTION

CORE SAMPLES (SHOWN AT VERTICAL SCALE):









integral consulting inc.

Figure 5-11
Cross Sections - Stations 1+00, 2+00
Alternative 3 - Inner Berth Sediment Removal and Capping
Slip 4 EE/CA

Map Document: (FG-Cross Sections.dwg) - Layout: Alt 3 - XSEC 1+00 & 2+00
2/7/2006 - 9:29:09 AM

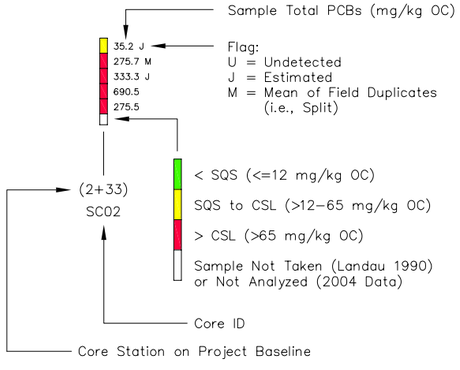
NOTES:

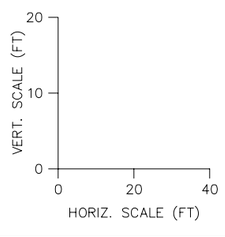
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.
2. DREDGE ELEVATIONS TO BE DETERMINED IN DESIGN.
3. DREDGE ELEVATIONS IN INNER BERTH TO BE DETERMINED IN DESIGN. CONFIRMATION SAMPLING AND CONTINGENCY ACTIONS TO ENSURE FINAL SURFACE MEETS SQS.

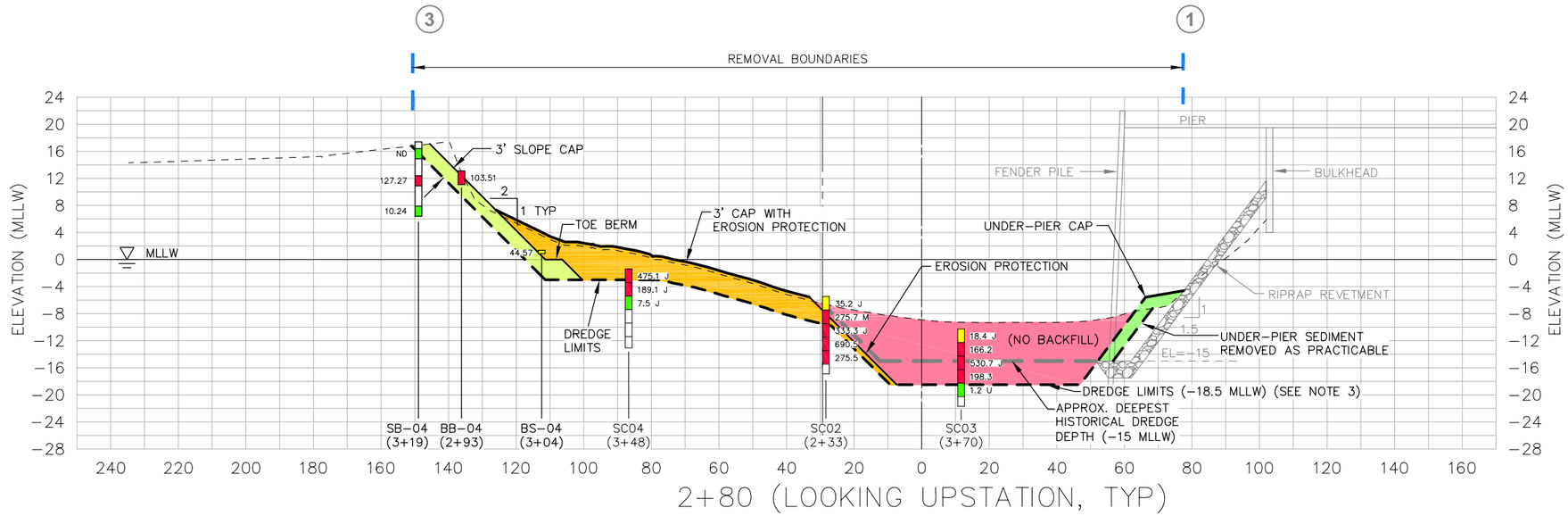
LEGEND:

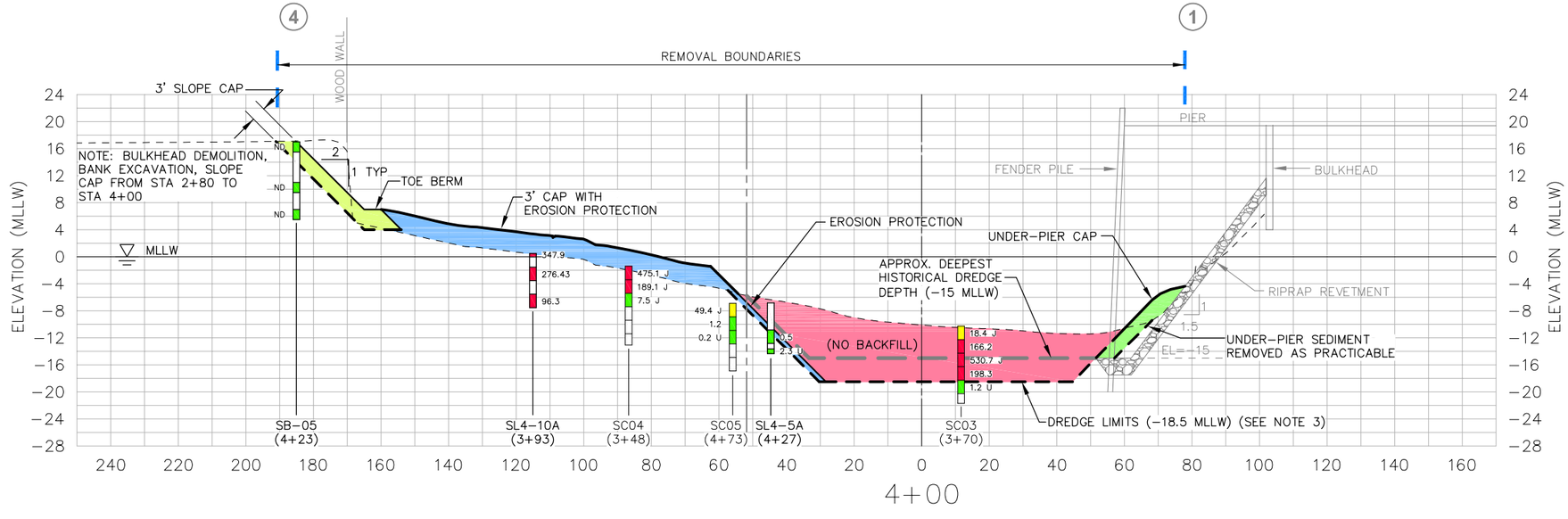
- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE TO DESIGN ELEVATION (REMOVING 3-6 FEET - SEE NOTE 2). CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- DREDGE TO DESIGN ELEVATION (NO BACKFILL) (SEE NOTE 3)
- SLOPE CAP
- UNDER-PIER SLOPE CAP
- CAP WITH EROSION PROTECTION

CORE SAMPLES (SHOWN AT VERTICAL SCALE):









Map Document: (FG-Cross Sections.dwg) - Layout: Alt 3 - XSEC 2+80 & 4+00
2/7/2006 - 9:29:38 AM

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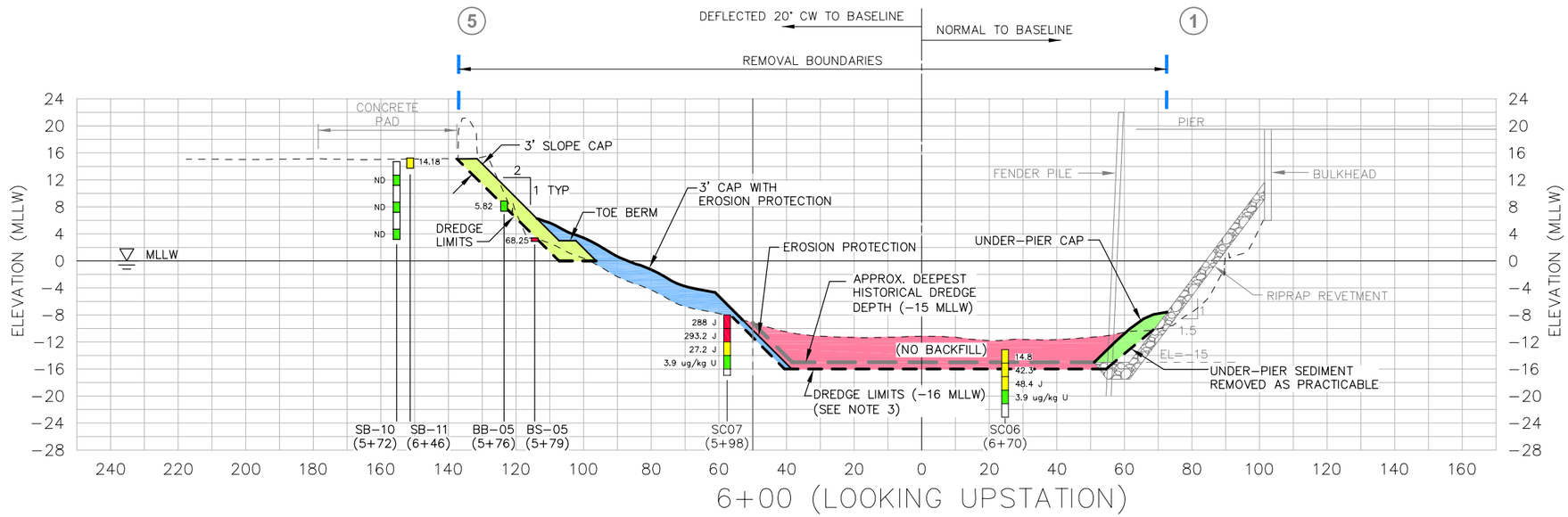
Figure 5-12
Cross Sections - Stations 2+80, 4+00
Alternative 3 - Inner Berth Sediment Removal and Capping
Slip 4 EE/CA

NOTES:

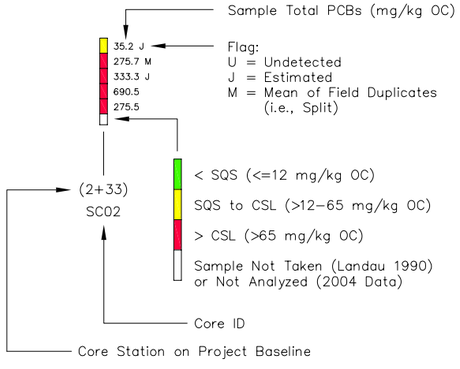
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.
2. DREDGE ELEVATIONS TO BE DETERMINED IN DESIGN.
3. DREDGE ELEVATIONS IN INNER BERTH TO BE DETERMINED IN DESIGN. CONFIRMATION SAMPLING AND CONTINGENCY ACTIONS TO ENSURE FINAL SURFACE MEETS SQS.

LEGEND:

- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE TO DESIGN ELEVATION (REMOVING 3-6 FEET - SEE NOTE 2). CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- DREDGE TO DESIGN ELEVATION (NO BACKFILL) (SEE NOTE 3)
- SLOPE CAP
- UNDER-PIER SLOPE CAP
- CAP WITH EROSION PROTECTION



CORE SAMPLES (SHOWN AT VERTICAL SCALE):



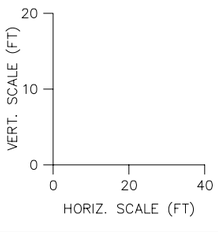


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Figure 5-13
Cross Section - Station 6+00
Alternative 3 - Inner Berth Sediment Removal and Capping
Slip 4 EE/CA

Map Document: (FG-Cross Sections.dwg) - Layout: Alt 4 - XSec Loc. Plan
2/7/2006 - 9:30:32 AM

LEGEND

- MAJOR OUTFALL
- POWER POLE
- SANITARY MANHOLE
- LUMINARE
- IRRIGATION CONTROL VALVE
- GUY WIRE
- 19.41WALL — SPOT ELEVATION
- 5-FOOT CONTOUR INTERVAL
- 1-FOOT CONTOUR INTERVAL
- FINAL REMOVAL BOUNDARY
- APPROXIMATE PROPERTY LINE
- APPROXIMATE HISTORICAL (1981) DREDGE LIMITS
- 1+00 — PROJECT BASELINE
- 4 — SHORELINE ZONE
- SEEP SAMPLE LOCATION
- SURFACE/SUBSURFACE SAMPLE LOCATION – ECOLOGY (2005)
- SUBSURFACE SAMPLE LOCATION – INTEGRAL (2004)
- SUBSURFACE SAMPLE LOCATION – LANDAU (1990)
- DREDGE TO DESIGN ELEVATION (REMOVING 4–10 FEET – SEE NOTE 6). CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- DREDGE TO DESIGN ELEVATION (NO BACKFILL) (–16 FEET MLLW OR DEEPER – SEE NOTE 6)
- SLOPE CAP
- UNDER-PIER SLOPE CAP

NOTES

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD–83/91), U.S. FEET.
2. CONTOURS ARE SHOWN IN FEET AT AN INTERVAL OF 1 FOOT AND INDICATE ELEVATIONS IN REFERENCE TO MEAN LOWER LOW WATER (MLLW). THE BENCH MARK USED IS "DEA 2005" MLLW ELEVATION 16.17'.
3. TOPOGRAPHIC & HYDROGRAPHIC BASE INFORMATION PROVIDED BY MINISTER–GLAESER SURVEYING INC, 2200 E. EVERGREEN BLVD., VANCOUVER, WA 98661; MGS JOB#: 04–368; MGS DRAWING NAME: 04368T1.DWG. DATA COLLECTED: OCTOBER 5, 2004.
4. 1981 DREDGE LIMITS FROM MARINE POWER & EQUIPMENT DRAWINGS 071–0YB–2–006580 SHEET 2 OF 4, AND 533–YD5–42CP SHEET 1 OF 10.
5. PROPERTY BOUNDARIES FROM SEATTLE PUBLIC UTILITIES GIS.
6. DREDGE ELEVATIONS TO BE DETERMINED IN DESIGN.

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Figure 5-14
Cross Section Location Plan
Alternative 4 - Maximum Reasonable Sediment Removal and Capping
Slip 4 EE/CA

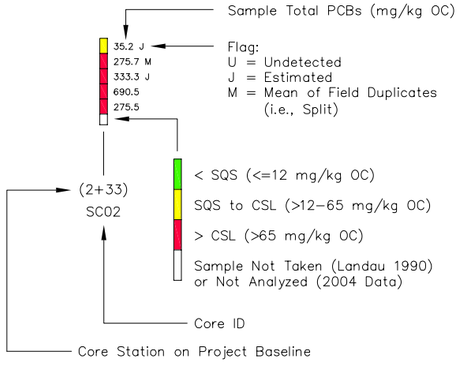
NOTES:

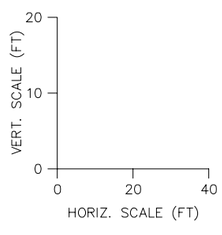
1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.
2. DREDGE ELEVATIONS TO BE DETERMINED IN DESIGN.
3. DREDGE ELEVATIONS IN INNER BERTH TO BE DETERMINED IN DESIGN. CONFIRMATION SAMPLING AND CONTINGENCY ACTIONS TO ENSURE FINAL SURFACE MEETS SQS.

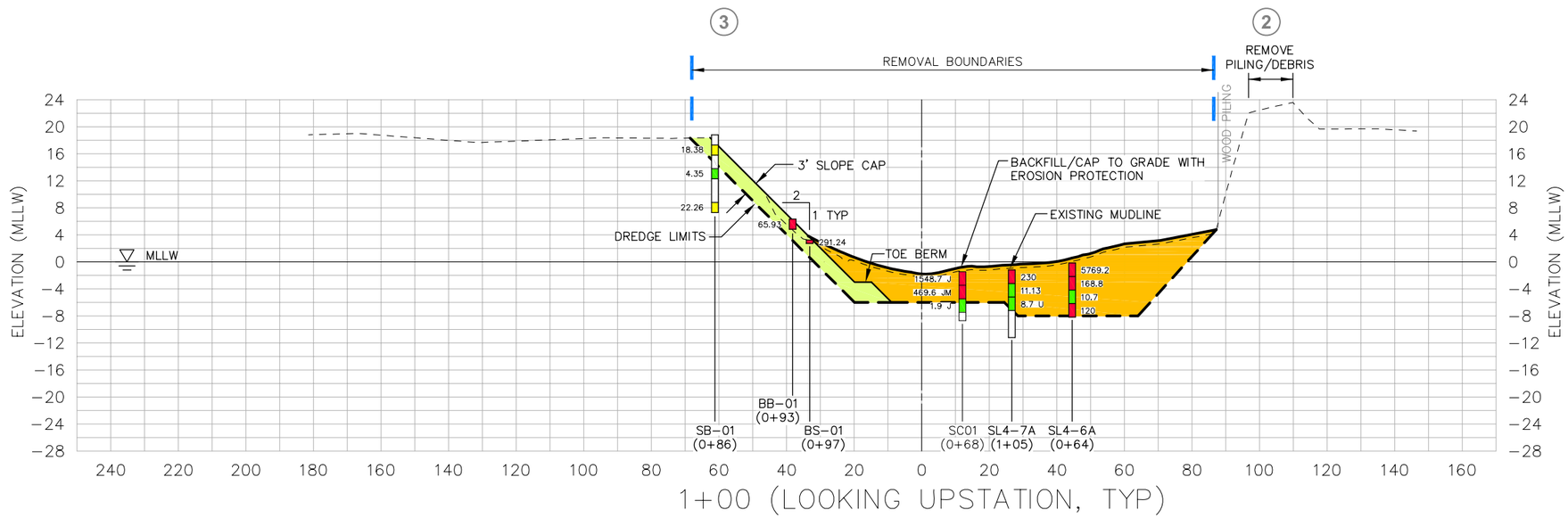
LEGEND:

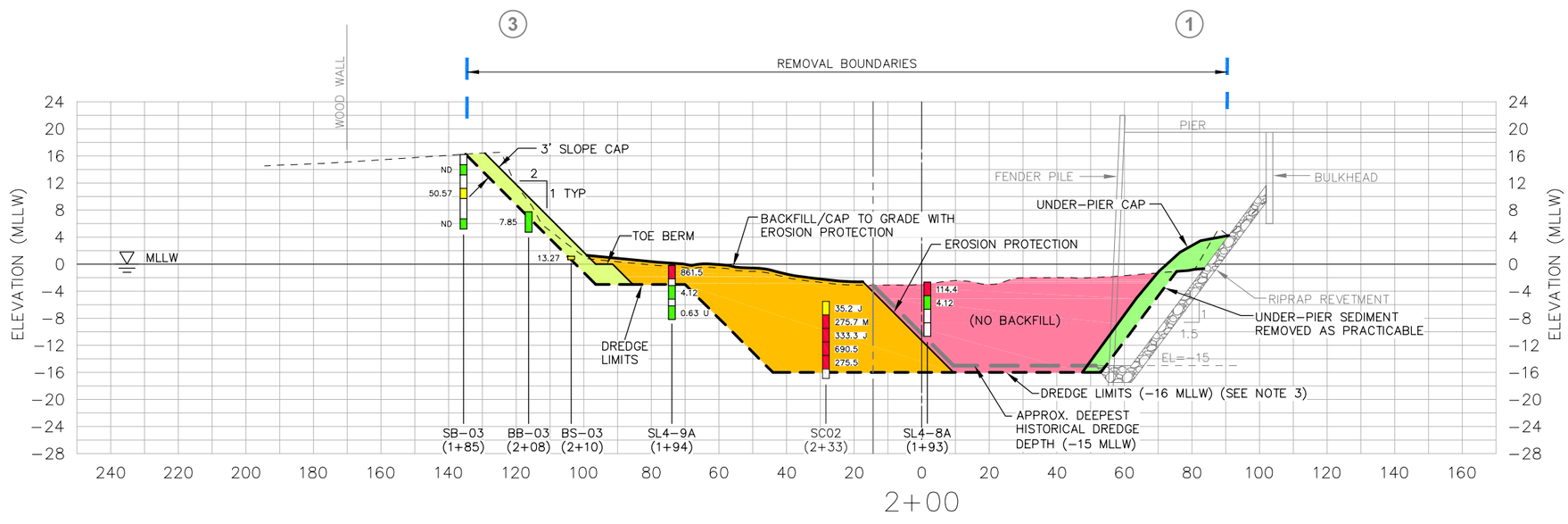
- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE TO DESIGN ELEVATION (REMOVING 4-10 FEET - SEE NOTE 2). CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- DREDGE TO DESIGN ELEVATION (NO BACKFILL) (SEE NOTE 3)
- SLOPE CAP
- UNDER-PIER SLOPE CAP

CORE SAMPLES (SHOWN AT VERTICAL SCALE):









Map Document: (FG-Cross Sections.dwg) - Layout: Alt 4 - XSEC 1+00 & 2+00
2/7/2006 - 9:31:03 AM

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Figure 5-15
Cross Sections - Stations 1+00, 2+00
Alternative 4 - Maximum Reasonable Sediment Removal and Capping
Slip 4 EE/CA

NOTES:

1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.
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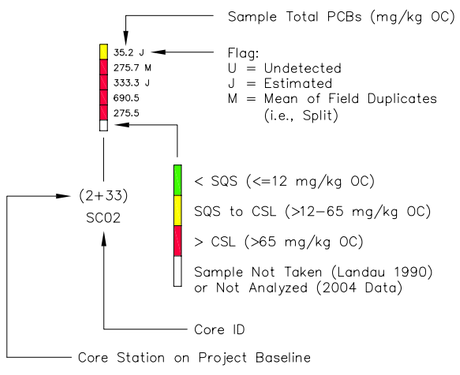
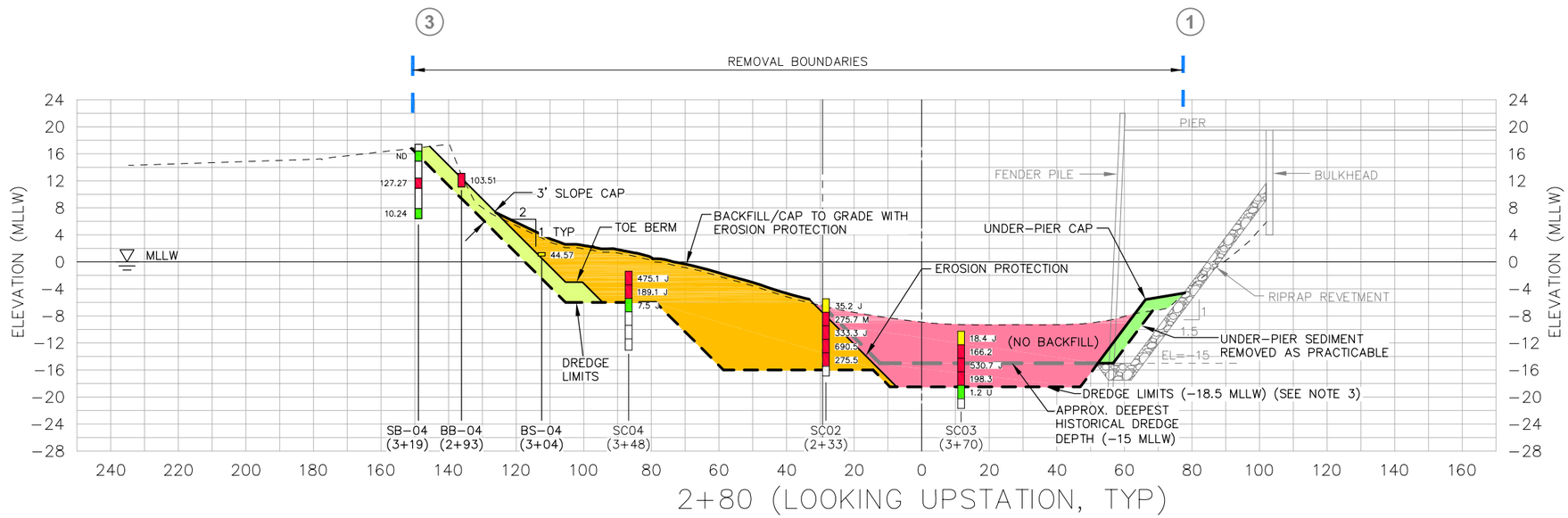
3. DREDGE ELEVATIONS IN INNER BERTH TO BE DETERMINED IN DESIGN. CONFIRMATION SAMPLING AND CONTINGENCY ACTIONS TO ENSURE FINAL SURFACE MEETS SQS.

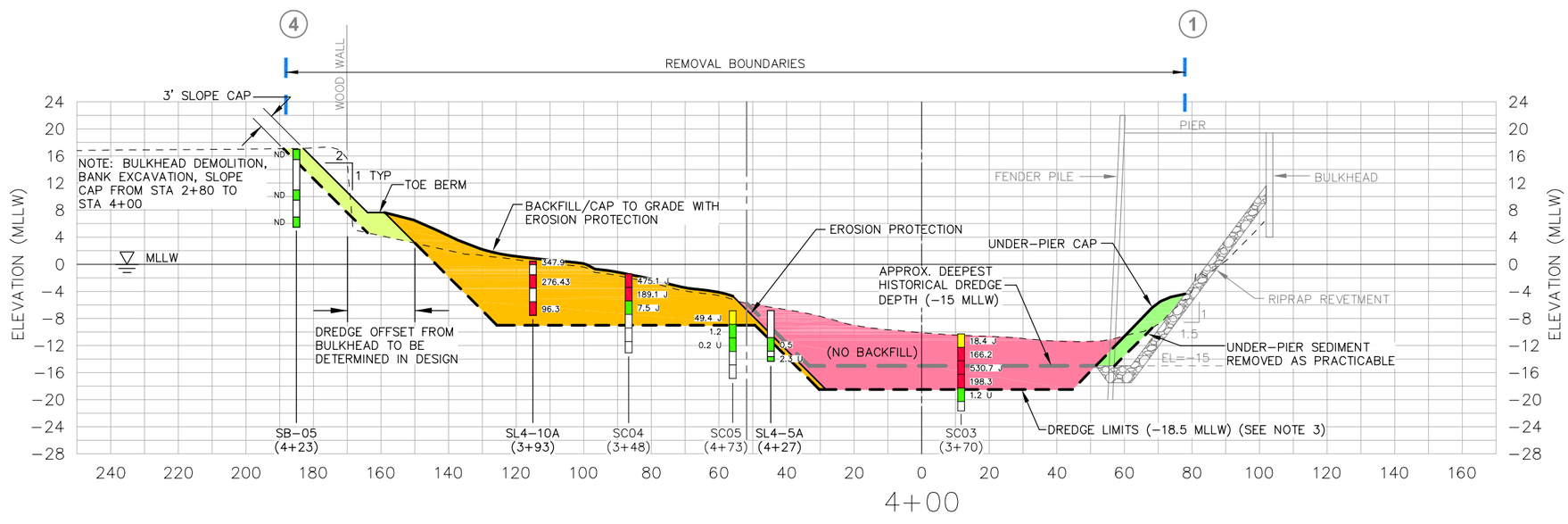
LEGEND:

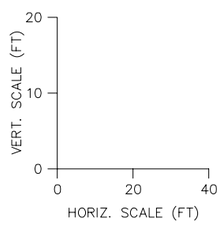
- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE TO DESIGN ELEVATION (REMOVING 4-10 FEET - SEE NOTE 2). CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- DREDGE TO DESIGN ELEVATION (NO BACKFILL) (SEE NOTE 3)
- SLOPE CAP
- UNDER-PIER SLOPE CAP

CORE SAMPLES (SHOWN AT VERTICAL SCALE):









Map Document: (FG-Cross Sections.dwg) - Layout: Alt 4 - XSEC 2+80 & 4+00
2/7/2006 - 9:31:32 AM

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Figure 5-16
Cross Sections - Stations 2+80, 4+00
Alternative 4 - Maximum Reasonable Sediment Removal and Capping
Slip 4 EE/CA

NOTES:

1. BULKHEAD, REVETMENT, AND FENDER PILE DETAILS FROM MARINE POWER AND EQUIPMENT CO., INC. DESIGN DRAWING NO. 533-YD5-42CP. UNDER-PIER PILING NOT SHOWN. AS-BUILT CONDITIONS MAY VARY.
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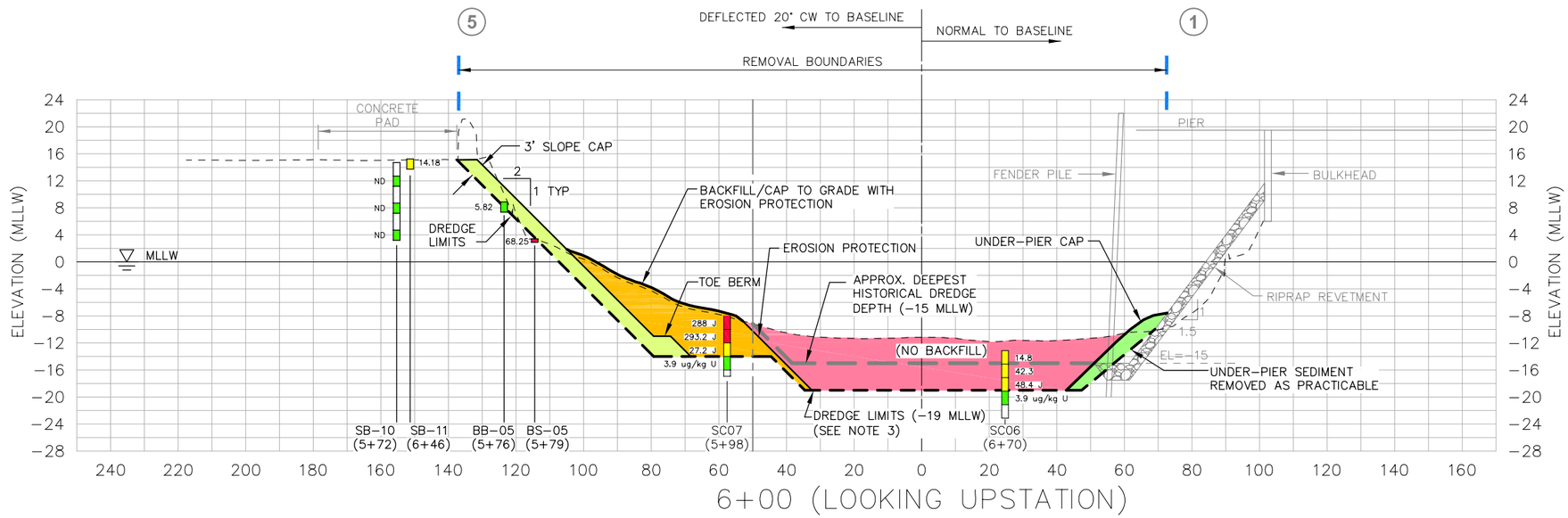
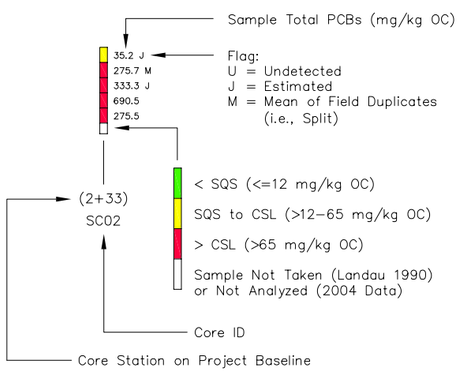
3. DREDGE ELEVATIONS IN INNER BERTH TO BE DETERMINED IN DESIGN. CONFIRMATION SAMPLING AND CONTINGENCY ACTIONS TO ENSURE FINAL SURFACE MEETS SQS.

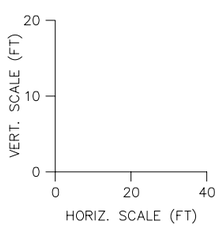
LEGEND:

- EXISTING MUDLINE
- CAP SURFACE
- DREDGE LIMITS
- (4) SHORELINE ZONE
- DREDGE TO DESIGN ELEVATION (REMOVING 4-10 FEET - SEE NOTE 2). CAP TO GRADE WITH EROSION PROTECTION: EROSION PROTECTION REQUIREMENTS WILL VARY BY LOCATION, AS DETERMINED IN DESIGN
- DREDGE TO DESIGN ELEVATION (NO BACKFILL) (SEE NOTE 3)
- SLOPE CAP
- UNDER-PIER SLOPE CAP



CORE SAMPLES (SHOWN AT VERTICAL SCALE):





Map Document: (FG-Cross Sections.dwg) - Layout: Alt 4 - XSEC 6+00
2/7/2006 - 9:31:56 AM

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Figure 5-17
Cross Section - Station 6+00
Alternative 4 - Maximum Reasonable Sediment Removal and Capping
Slip 4 EE/CA