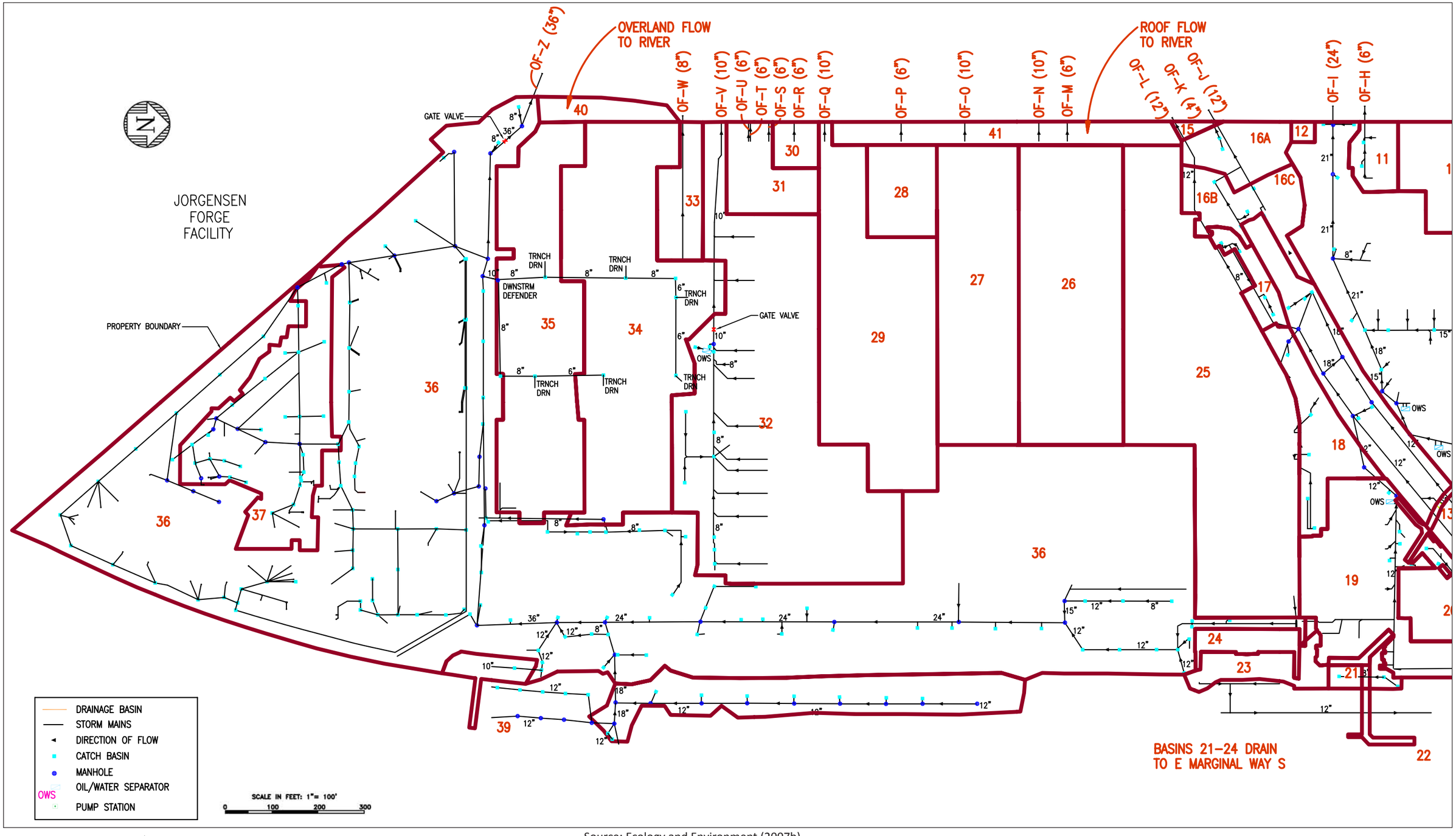

Source: Ecology and Environment (2007b)

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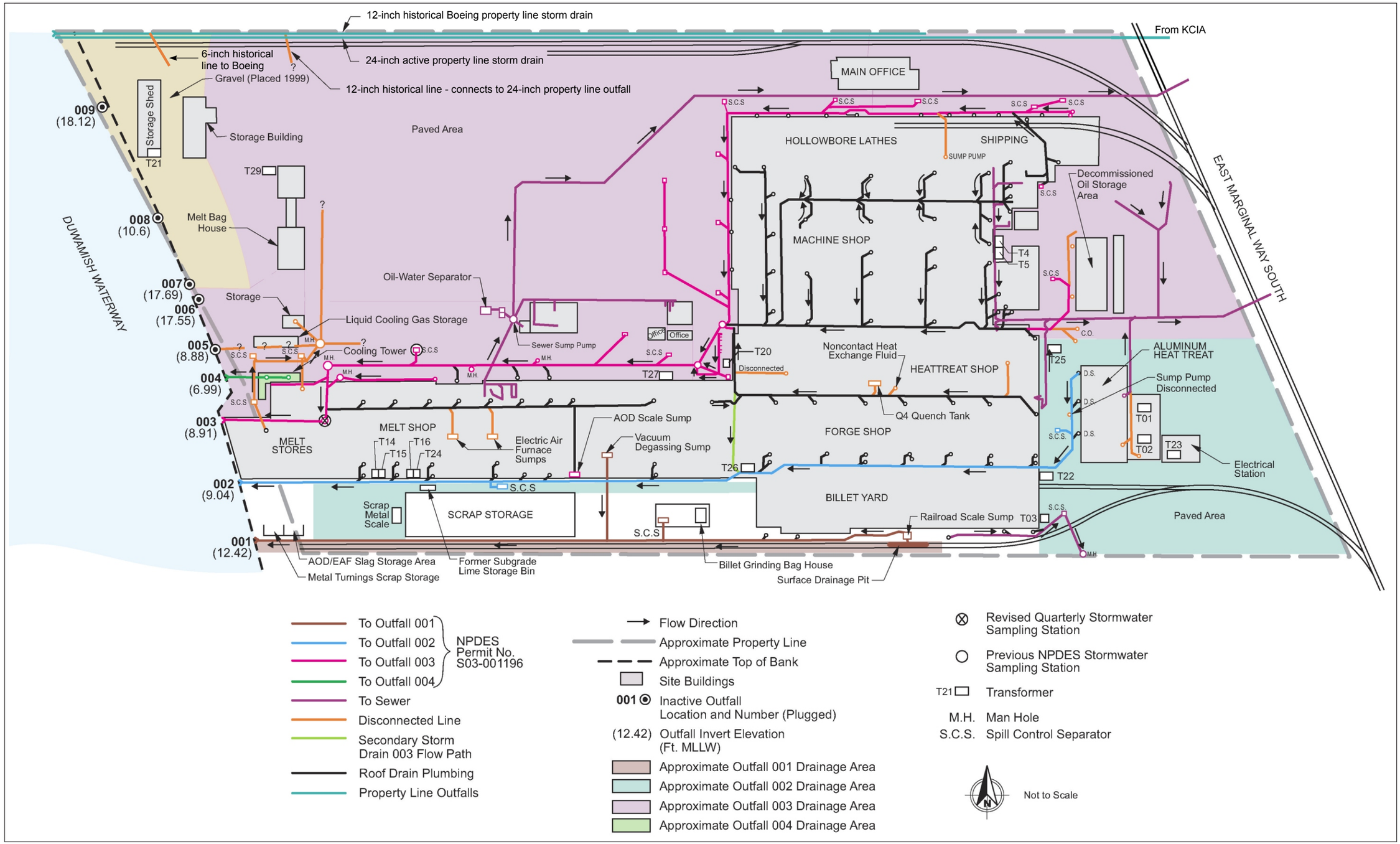
Map I-26. Stormwater drainage lines on Boeing Plant 2 – southern portion



Source: Ecology and Environment (2007b)

Map I-27. Stormwater drainage lines on the Jorgensen Forge facility and along the Boeing Plant 2/Jorgensen Forge boundary

Wind Ward environmental LLC

Benzo(g,h,i)perylene	3.2	1.3
Indeno(1,2,3-cd)pyrene	3.2	1.3
Dibenzo(a,h)anthracene	3.0	1.1
Fluoranthene	2.5	ne
Phenanthrene	2.1	ne
Total HPAH	1.9	ne
Chrysene	1.8	ne
Benzo(a)pyrene	1.7	ne
Benzofluoranthenes	1.4	ne
Arsenic	1.4	ne
Benzo(a)anthracene	1.4	ne
PCBs	1.1	ne
BEHP	1.0	ne

PCBs	2.5	ne

Fluoranthene	1.7	ne
Phenanthrene	1.3	ne
Chrysene	1.2	ne
Dibenzo(a,h)anthracene	1.1	ne
Total HPAH	1.0	ne

Benzo(g,h,i)perylene	5.8	2.3
Dibenzo(a,h)anthracene	5.9	2.2
Indeno(1,2,3-cd)pyrene	5.6	2.2
Benzo(a)pyrene	2.6	1.2
Benzofluoranthenes	2.3	1.2
BEHP	1.7	1.1
PCBs	4.3	ne
Fluoranthene	4.1	ne
Phenanthrene	3.9	ne
Total HPAH	3.1	ne
Chrysene	2.8	ne
BBP	2.4	ne
Benzo(a)anthracene	2.1	ne
Acenaphthene	1.4	ne
Total LPAH	1.4	ne
Fluorene	1.3	ne
Dibenzofuran	1.2	ne

Benzoic acid	1.2	1.2
BBP	1.3	ne

PCBs	1.7	ne

BBP	2.0	ne
PCBs	1.3	ne

Jorgensen Forge

King County International Airport

E Marginal Way S

Boeing Isaacson Property

Boeing Thompson Property

Former Kenworth Truck Company/PACCAR

S 92nd Pl

Former Rhône-Poulenc

Slip 6

Boeing Developmental Center

3.7

3.9

4.1

2063

EST148

LDW-SS115

R22

2062, SPU/King County EOF/SD

2061, Boeing – Thompson

R23

LDW-SS158

LDW-SS157

R26

2077, Boeing – Thompson

Chemical	Exceedance Factor	
	SQS	CSL
PCBs	15	2.8

SQS and CSL exceedances are reported only for detected concentrations; reporting limits for undetected chemicals that were above the SQS or CSL are not included. When OC-normalization was not appropriate because TOC content was < 0.5% or > 4.0%, dry weight concentrations for these locations are compared instead to the LAET and 2LAET.

Chemicals in red exceeded CSL. The exceedance factor has no regulatory relevance and is presented here to provide an indication of the general magnitude of the concentration. Sampling locations represented by circles were analyzed for SMS chemicals. Surface sediment samples were collected at depths ≤ 15 cm below mudline.

ne - no exceedance

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2008 SCA boundary
- Subsurface sediment sampling location
- EOF/storm drain
- Permitted private storm drain
- Pipe of unresolved origin and/or use
- Abandoned
- Tax parcel
- SCA-associated property[a]
- EAA boundary[b]
- 2008 SCA boundary[c]
- River mile
- Navigation channel
- Former Slip 5 (1949)

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] The early action area boundary is preliminary and has not been finalized by EPA and Ecology.

[c] Boundary shown is based on Ecology and SAIC (2008).

KCIA SD No. 2 / PS78 EOF drainage basin
Source: Schmoyer (2008a)

0 250 500 1,000 Feet

North Boeing Field

King County International Airport

Boeing Plant 2

Boeing Plant 2

Jorgensen Forge

Boeing Isaacson

Boeing Thompson

Former Kenworth Truck Company/PACCAR

Wind Ward environmental LLC

N

0 200 400 Feet

0 50 100 Meters

Map I-28. Surface sediment and drainage basin information for the Boeing Isaacson/ Central KCIA SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

Data availability by media type for each facility and major outfall associated with the Boeing Isaacson/Central KCIA SCA

Facility[1]	Soil	Ground-water	Seep	Pore-water[2]	Storm-water[3]	Source-Tracing Data	
						Onsite Catch Basin	ROW Catch Basins
Boeing Isaacson	X	X			X		
Boeing Thompson	X	X	X				
KCIA (central drainage basin)	X	X				X	X
Major Outfalls[4]							
KCIA SD No. 2/Pump Station 78 EOF	na	na	na	na		X	X

An X indicates that source documents reported that data are available or the existence of data was implied for the identified media; however, the analytical data may not have been provided in the source documentation. Absence of an X does not necessarily indicate that facility-specific data for that media type do not exist.

[1] Facilities listed are those identified in the data gaps report (SAIC 2008b) and draft SCAP (Ecology 2008a) with relevant source control information.

[2] No porewater data were identified in the source documents for any facility.

[3] The presence of stormwater data collected from the Boeing Isaacson facility was reported in the draft SCAP (Ecology 2008a); however, actual data were not presented in the source documents.

[4] Major outfalls listed are those discussed as individual source control entities in the source documentation.

na - not applicable

KCIA (Central Drainage Basin): Soil and groundwater investigations have been conducted, and USTs and contaminated soil have been removed at several tenant facilities. Groundwater remediation associated with a LUST was conducted at a former tenant facility. Source tracing samples have been collected within the central KCIA drainage basin, and catch basins located on some portions of the drainage basin have been cleaned out. Additional source tracing investigations, including sampling of joint caulking material, and SD system inspections are planned. Source control practices related to NPDES permit compliance are also in place at several of the tenant facilities.

Boeing Isaacson: Soil and groundwater investigations and remedial activities, including soil removal and onsite soil treatment and capping, were conducted throughout the 1980s and 1990s. Several groundwater monitoring events have been conducted since 1991. An RI/FS will be conducted at the property under a MTCA order. Additional source control investigations may be conducted as part of the RI/FS.

Boeing Thompson: Soil and groundwater investigations have been conducted since the 1990s, and three USTs have been decommissioned. Multiple site inspections have also been conducted on the property. Source control practices related to NPDES permit compliance are in place. An RI/FS will be conducted at the property under a MTCA order. Additional source control investigations may be conducted as part of the RI/FS.

KCIA SD No. 2 / Pump Station 78 EOF: Several business inspections have been conducted within the drainage basin, and source tracing samples have been collected. See the KCIA (Central Drainage Basin) text box for additional information.

King County International Airport
Jorgensen Forge
Boeing Isaacson Property
Boeing Thompson Property
Former Kenworth Truck Company/PACCAR
3.7
3.9
Duwamish Waterway

- Source-tracing sampling location
- Private mainline
- Public mainline
- Public lateral line
- KCIA SD No. 2 / PS78 EOF drainage basin
  Source: Schmoyer (2008a)

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2008 SCA boundary
- Subsurface sediment sampling location
- EOF/storm drain
- Permitted private storm drain
- Pipe of unresolved origin and/or use
- Tax parcel
- SCA-associated property[a]
- EAA boundary[b]
- 2008 SCA boundary[c]
- River mile
- Navigation channel
- Former Slip 5 (1949)

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] The early action area boundary is preliminary and has not been finalized by the EPA and Ecology.

[c] Boundary shown is based on Ecology and SAIC (2008).

Sources of information for facilities, outfalls, the drainage basin and for source tracing samples: Ecology (2008a), SAIC (2008b), Schmoyer (2008a; 2008d).

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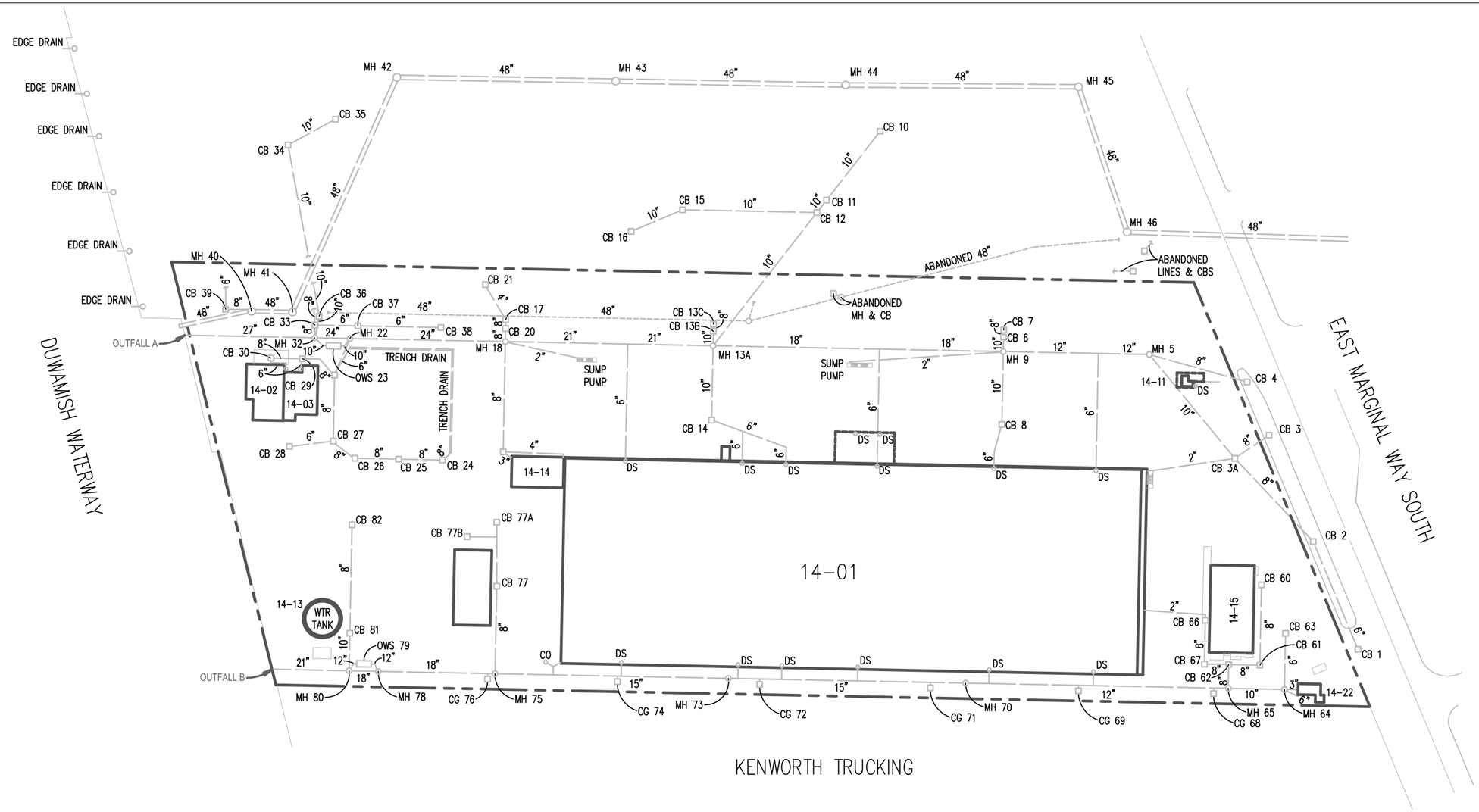
N

0 250 500 Feet

0 100 200 Meters

Map I-29. Regulatory investigation, remediation, and drainage basin information for the Boeing Isaacson/Central KCIA SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.



DRAINAGE AREA TABLE

OUTFALL LETTER	BASIN NUMBER	BASIN AREA (ACRES)	REMARKS
A	1	13.06	
B	2	6.05	
TOTAL		19.11	

THOMPSON SITE
STORMWATER SITE MAP
SCALE: 1" = 100'

Source: Boeing (2008) as provided in SAIC (2008b)

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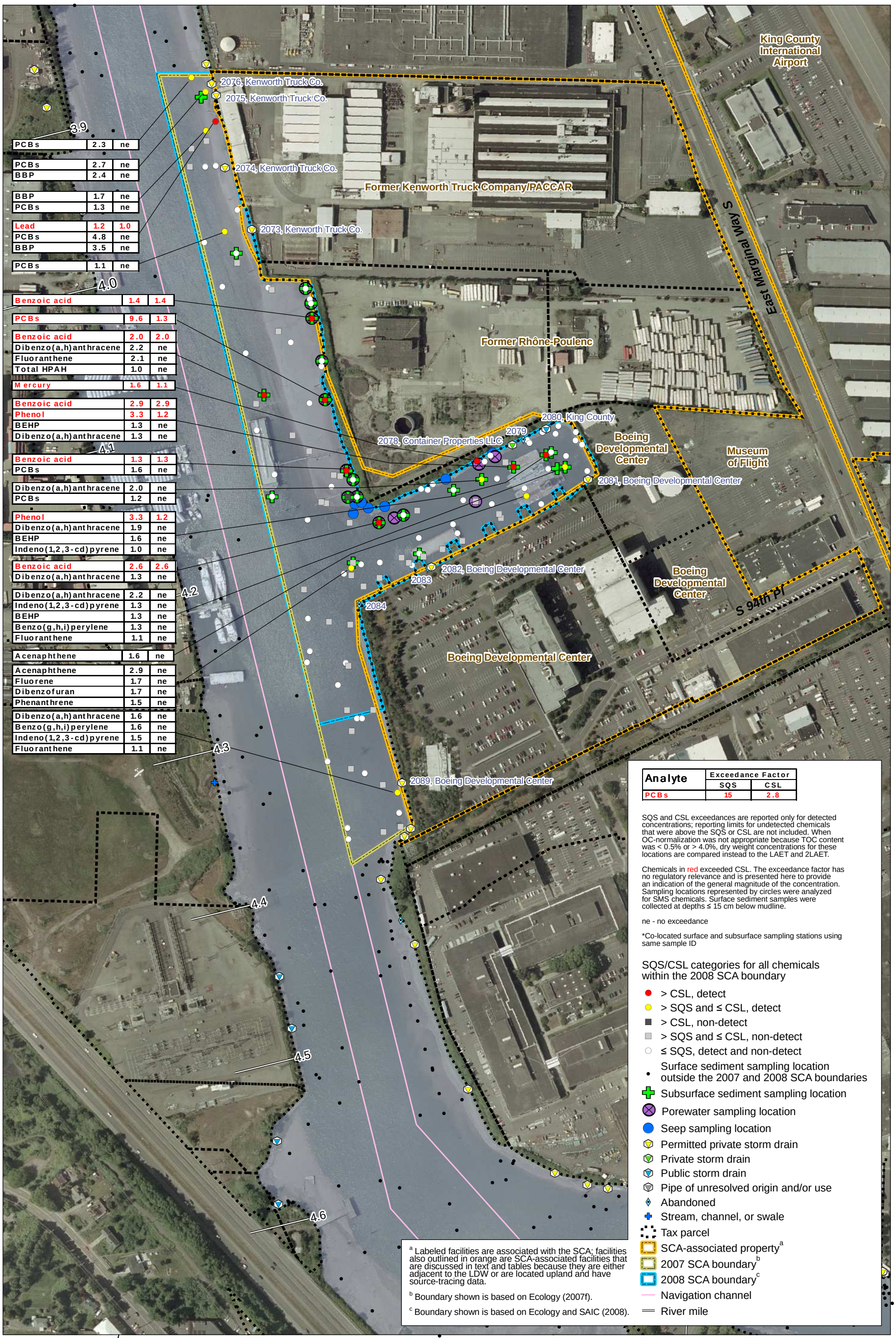
Map I-30. Stormwater drainage lines on the Boeing Thompson and Boeing Isaacson properties



Analyte	Exceedance Factor	
	SQS	CSL
PCBs	15	2.8

SQS and CSL exceedances are reported only for detected concentrations; reporting limits for undetected chemicals that were above the SQS or CSL are not included. When OC-normalization was not appropriate because TOC content was < 0.5% or > 4.0%, dry weight concentrations for these locations are compared instead to the LAET and 2LAET.

Chemicals in red exceeded CSL. The exceedance factor has no regulatory relevance and is presented here to provide an indication of the general magnitude of the concentration. Sampling locations represented by circles were analyzed for SMS chemicals. Surface sediment samples were collected at depths ≤ 15 cm below mudline.

ne - no exceedance

*Co-located surface and subsurface sampling stations using same sample ID

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > CSL, non-detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2007 and 2008 SCA boundaries
- Subsurface sediment sampling location
- Porewater sampling location
- Seep sampling location
- Permitted private storm drain
- Private storm drain
- Public storm drain
- Pipe of unresolved origin and/or use
- Abandoned
- Stream, channel, or swale
- Tax parcel
- SCA-associated property[a]
- 2007 SCA boundary[b]
- 2008 SCA boundary[c]
- Navigation channel
- River mile

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] Boundary shown is based on Ecology (2007f).

[c] Boundary shown is based on Ecology and SAIC (2008).

Wind Ward LLC environmental

N

0 250 500 Feet

0 100 200 Meters

Map I-31. Surface sediment information for the Slip 6 SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

PACCAR: Environmental investigations involving groundwater, soil, sediment, source tracing, air, and seep sampling have been conducted. Remedial actions have included closure and removal of USTs, groundwater extraction, application of oxygen-releasing compound to soils and groundwater, excavation and removal of petroleum contaminated soils, and installation of an AS/SVE system to treat VOCs. The middle outfall (No. 2074) was closed and the complete stormwater system was cleaned. An investigation of the north storm drain was completed and the drain was repaired. Stormwater quality improvements were conducted in 2008 and monitoring is ongoing. Planned actions include a soil and groundwater investigation of the southern shoreline and northwest corner, additional sediment coring, and a review of the current O&M plan.

Rhône-Poulenc: Environmental investigations involving groundwater, soil, source tracing, sediment, and seep sampling have been conducted. Remedial actions have included PCB removal, SVE system operation, hydraulic control interim measure implementation, hazardous waste storage area cleanup, transformer area cleanup, east parcel voluntary interim measure, northwest corner soil removal, and west parcel redevelopment. The stormwater system was redeveloped in 2007. Quarterly groundwater monitoring is ongoing. Planned actions include an investigation of shoreline bank contamination, review of the stormwater system, and review of the O&M plan.

Boeing Developmental Center: No environmental investigations or remedial actions have been reported within the Slip 6 SCA drainage area. NPDES permit and SWPPP monitoring requirements have been established for this property. An evaluation of the drainage system and the current SWPPP is planned.

KCIA: One catch basin solids sample was collected in 2004. Airport catch basins have been cleaned semi-annually and airport O/W separators are cleaned annually. Evaluations of the drainage system are planned. An evaluation of joint caulk material for PCBs is also planned.

Data availability by media type for each facility associated with the Slip 6 SCA

Facility[1]	Soil	Groundwater	Seep	Porewater	Stormwater	Source-Tracing Data: Onsite Catch Basins
Boeing Developmental Center (northern drainage area)						
KCIA (southwest)			na	na		X
PACCAR (former)	X	X	X		X	X
Rhône-Poulenc (former)[2]	X	X	X	X		

An X indicates that source documents reported that data are available or the existence of data was implied for the identified medium; however, the analytical data may not have been provided in the source documentation. Absence of an X does not necessarily indicate that facility-specific data for that media type do not exist.

[1] Facilities listed are those identified in the data gaps report (Ecology and Environment 2008) and SCAP (Ecology and Ecology and Environment 2008) with relevant source control information.

[2] Includes east and west parcels

na - not applicable

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > CSL, non-detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2007 and 2008 SCA boundaries
- Subsurface sediment sampling location
- Porewater sampling location
- Seep sampling location
- Permitted private storm drain
- Private storm drain
- Public storm drain
- Pipe of unresolved origin and/or use
- Abandoned
- Stream, channel, or swale
- Tax parcel
- SCA-associated property[a]
- 2007 SCA boundary[b]
- 2008 SCA boundary[c]
- Navigation channel
- River mile

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] Boundary shown is based on Ecology (2007f).

[c] Boundary shown is based on Ecology and SAIC (2008).

Sources of information for facility, outfall, and drainage basin: Ecology and Ecology and Environment (2008), Ecology and Environment (2007b), Schmoyer (2008d).

Private mainline
Public mainline
Public lateral line
Portion of KCIA that drains to Slip 6

0 500 1,000 Feet

0 250 500 Feet

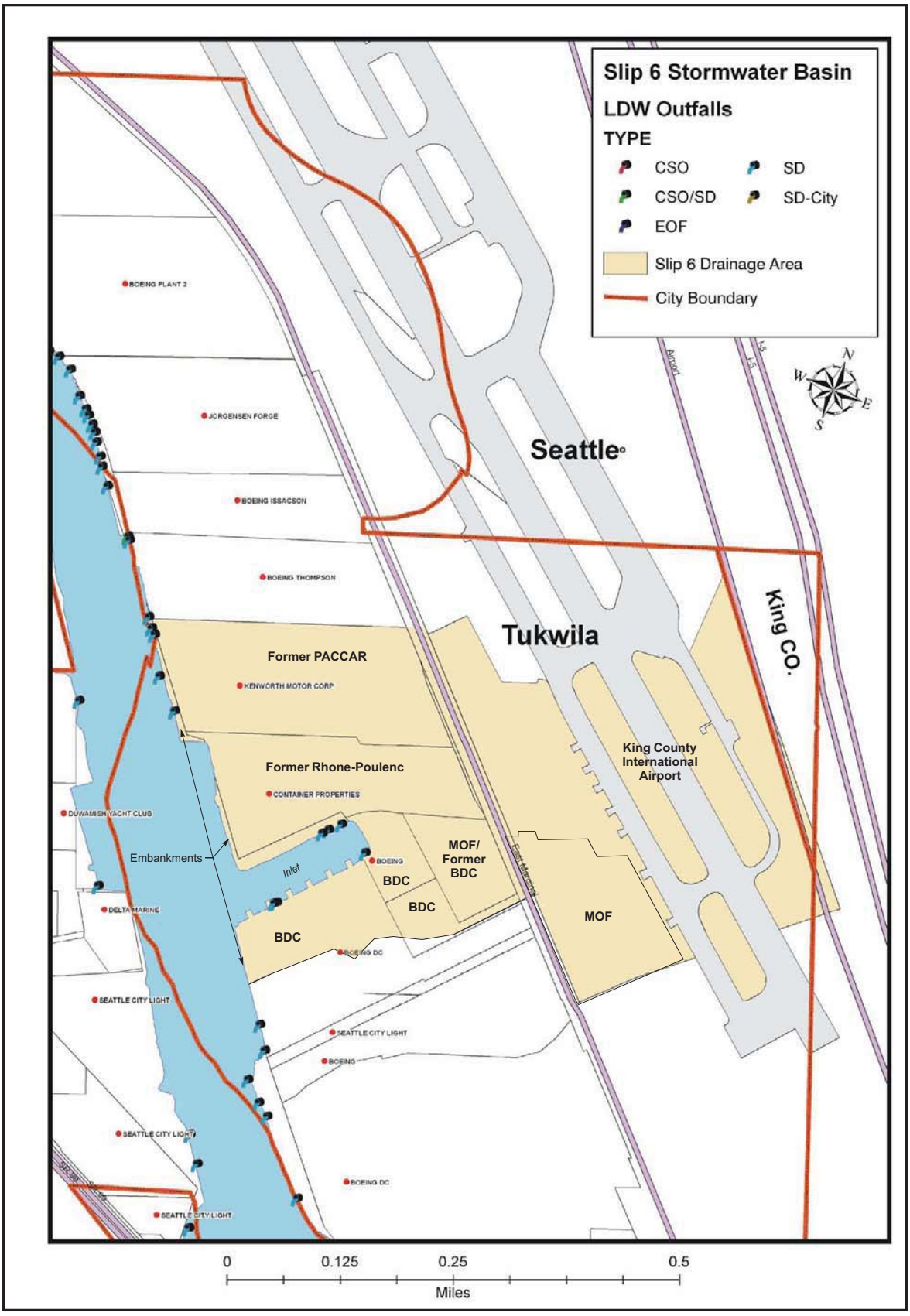
0 100 200 Meters

Wind Ward LLC environmental

Map I-32. Regulatory investigation, remediation, and drainage basin information for the Slip 6 SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

Prepared by CEH, 07/13/2010, MAP #3444, W:\Projects\00-08-06_Duwamish_R\data\GIS\Phase2 RI\Source Control\Appendix I



Source: Ecology (2008). Base Map Reference: Department of Ecology.

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Map I-33. Drainage basin for the Slip 6 SCA

Analyte	Exceedance Factor	
	SQS	CSL
PCBs	15	2.8

SQS and CSL exceedances are reported only for detected concentrations; reporting limits for undetected chemicals that were above the SQS or CSL are not included. When OC-normalization was not appropriate because TOC content was < 0.5% or > 4.0%, dry weight concentrations for these locations are compared instead to the LAET and 2LAET.

Chemicals in red exceeded CSL. The exceedance factor has no regulatory relevance and is presented here to provide an indication of the general magnitude of the concentration. Sampling locations represented by circles were analyzed for SMS chemicals. Surface sediment samples were collected at depths ≤ 15 cm below mudline.

ne - no exceedance

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > CSL, non-detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2008 SCA boundary
- Subsurface sediment sampling location
- CSO/storm drain
- Permitted private storm drain
- Pipe of unresolved origin and/or use
- Tax parcel
- SCA-associated property[a]
- EAA boundary[b]
- 2008 SCA boundary[c]
- Norfolk SD drainage basin[d]
- River mile
- Navigation channel

[b] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] For the Norfolk early action area, surface sediment data represent samples collected after dredging and capping at the Norfolk CSO/SD removal area in 1999 and before sediment removal and capping at the Boeing Developmental Center south storm drain removal area in 2003. The Norfolk boundary represents the area of remediation actions that have been completed to date. Boundary shown is based on Ecology (2007f).

[c] Boundary shown is based on Ecology and SAIC (2008).

[d] Source: Schmoyer (2008a).

3.8
3.9
4.1
4.2
4.3
4.4
4.5
4.6
4.7
4.8
4.9
5.0
5.1
5.2
5.3
5.4
5.5
5.6
Boeing Developmental Center
King County International Airport
Military Flight Center
Boeing
Northwest Auto Wrecking
Associated Grocers
S 102nd St
Hwy 99
East Marginal Way S
Airport Way S
Interstate 5
MLK Jr Way S
S Norfolk St
Affordable Auto Wrecking
Arco Gas Station

Boeing Developmental Center
Boeing
BDC-5, Boeing Developmental Center
2096, Boeing Developmental Center
2093, Boeing Developmental Center
2094
2095 – Norfolk CSO/SD (044), KC/SPU/Boeing

LDW-SS144	PCBs (total calc'd)	2.10	ne
5	PCBs (total calc'd)	1.80	ne
NFK507	BEHP	1.90	1.20
	PCBs (total calc'd)	33.0	6.00
	BBP	1.10	ne
7	PCBs (total calc'd)	16.0	2.90
NFK508	PCBs (total calc'd)	33.0	6.20
4	PCBs (total calc'd)	28.0	5.10
6	PCBs (total calc'd)	1.30	ne
11	PCBs (total calc'd)	1.50	ne
R88	1,4-Dichlorobenzene	21.0	7.20
NFK004A	BEHP	2.00	1.40
	BBP	2.20	ne
	Fluoranthene	1.30	ne
	PCBs (total calc'd)	2.90	ne
NFK005	BEHP	1.40	ne
NFK501 - Apr-01	BBP	1.40	ne
NFK503 - Apr-02	PCBs (total calc'd)	2.50	ne

Dredged and capped area
- Boeing Developmental Center south storm drain
- Norfolk CSO/SD

0 50 100 Feet

Wind Ward environmental LLC

N

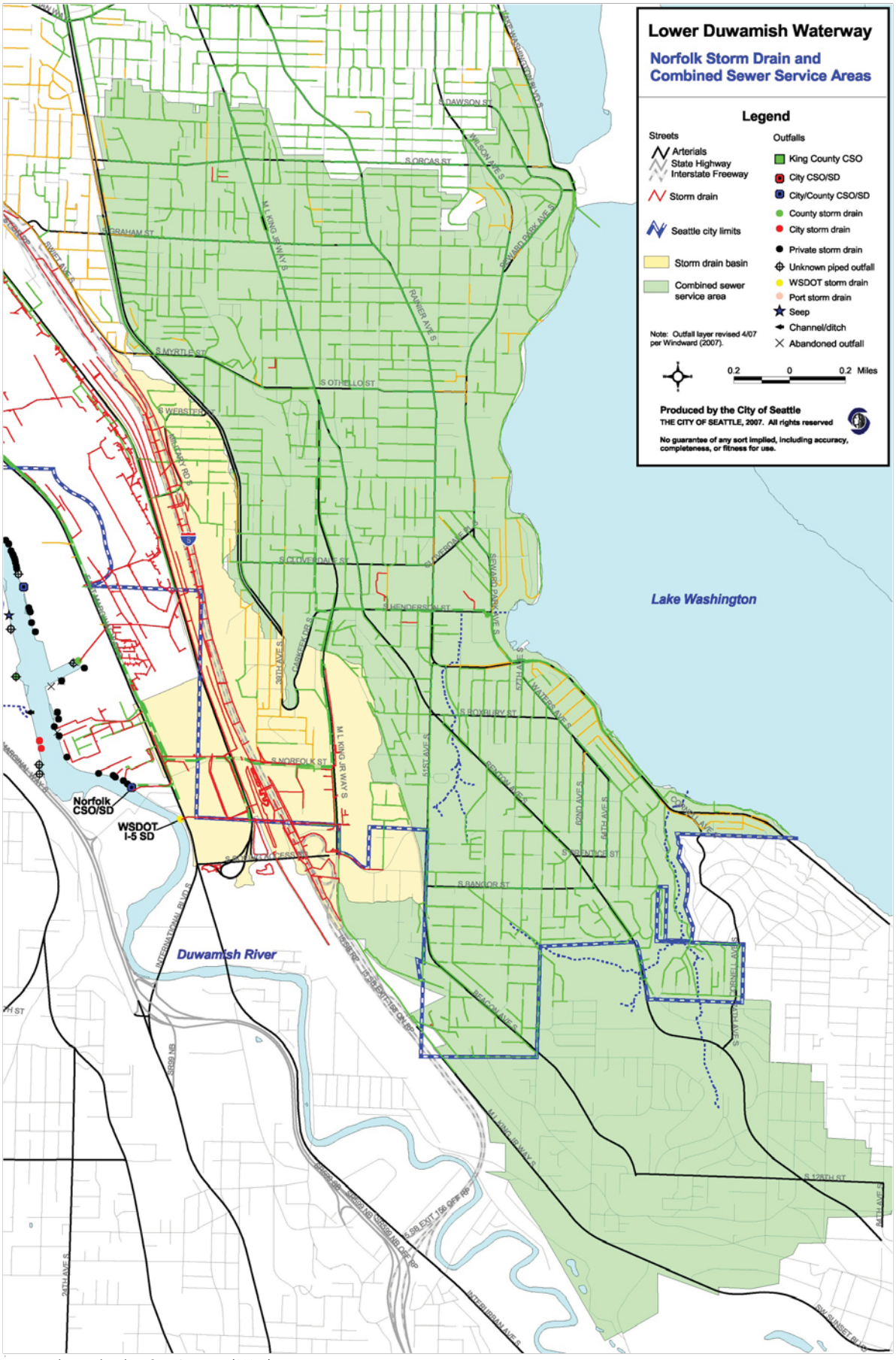
0 1,000 2,000 Feet

0 250 500 Meters

Map I-34. Surface sediment and drainage basin information for the Norfolk CSO/SD SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

Prepared by CEH, 07/13/2010: MAP 3017: W:\Projects\00-08-06_Duwamish_RI\data\gis\Phase2 RI\Source Control\Appendix I



Source: Ecology and Ecology & Environment (2007a)

Map I-35. Drainage basins for the Norfolk CSO/SD SCA

Wind Ward environmental LLC

Data availability by media type for each facility and major outfall associated with the Norfolk CSO/SD SCA

Facility[1]	Soil	Groundwater	Seep[2]	Pore-water[2]	Storm-water	Source-Tracing Data					
						Onsite Catch Basins	ROW Catch Basins	Manhole	In-line Sediment	Outfall Discharge	Joint Caulking
Arco Gas Station	X	X							X		
BDC	X	X			X	X		X	X	X	X
Boeing Military Flight Center											X
KCIA[3, 4]											
Major Outfalls[5]											
Boeing South SD	na	na	na	na		X		X			X
Norfolk CSO/SD	na	na	na	na			X		X		

An X indicates that source documents reported that data are available or the existence of data was implied for the identified media; however, the analytical data may not have been provided in the source documentation. Absence of an X does not necessarily indicate that facility-specific data for that media type do not exist.

[1] Facilities listed are those identified in the data gaps report (Ecology and Environment 2007) and the SCAP (Ecology 2007) with relevent source control information.

[2] No seep or porewater data were identified in the source documents for any facility.

[3] KCIA information in this section pertains only to the area of KCIA that drains to the Norfolk SCA.

[4] No soil, groundwater, seep, porewater, stormwater, or source-tracing data were identified in the source documents for this facility.

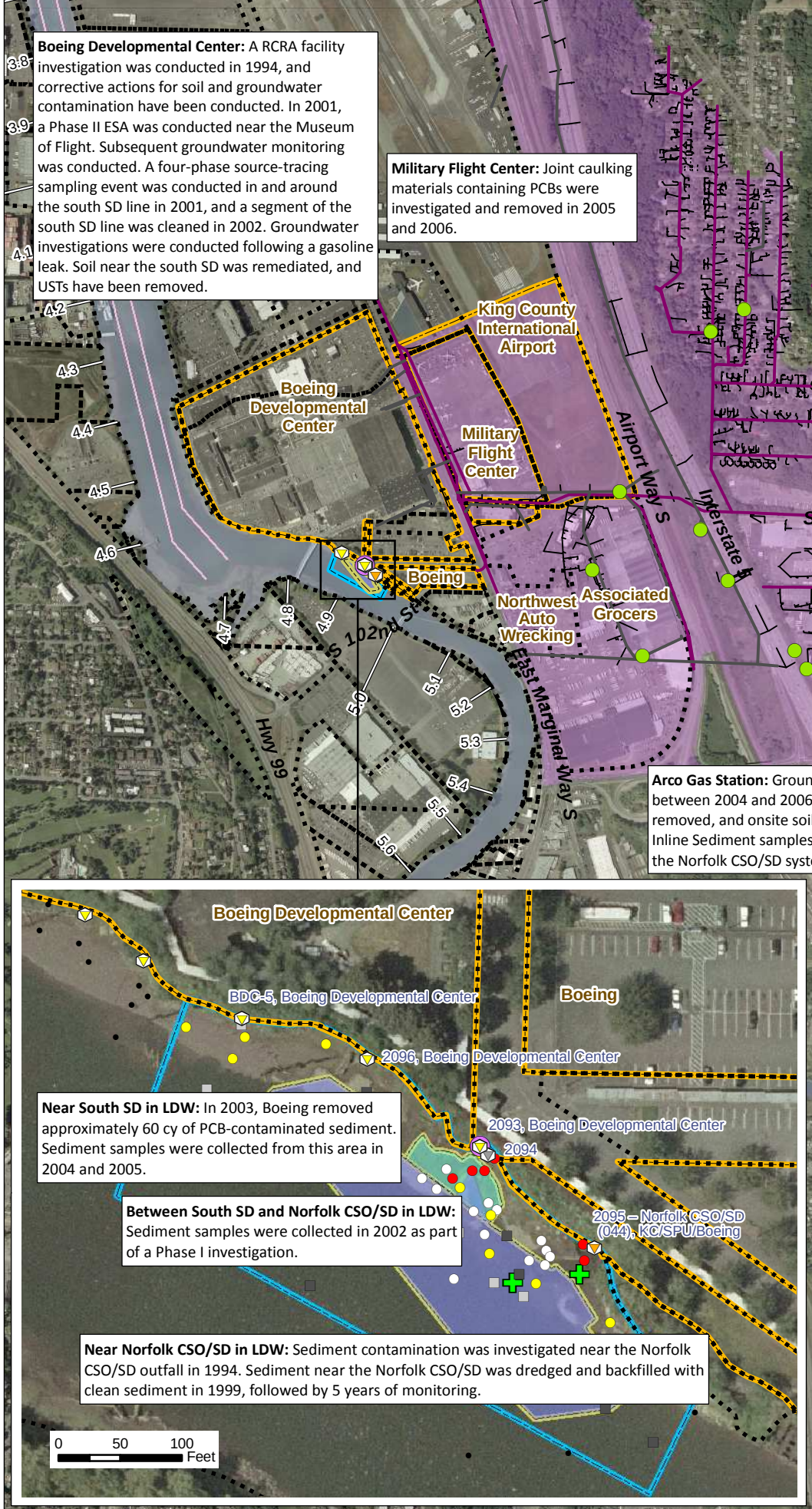
[5] Major outfalls listed are those discussed as individual source control entities in the source documentation.

na - not applicable

Boeing Developmental Center: A RCRA facility investigation was conducted in 1994, and corrective actions for soil and groundwater contamination have been conducted. In 2001, a Phase II ESA was conducted near the Museum of Flight. Subsequent groundwater monitoring was conducted. A four-phase source-tracing sampling event was conducted in and around the south SD line in 2001, and a segment of the south SD line was cleaned in 2002. Groundwater investigations were conducted following a gasoline leak. Soil near the south SD was remediated, and USTs have been removed.

Military Flight Center: Joint caulking materials containing PCBs were investigated and removed in 2005 and 2006.

Arco Gas Station: Groundwater sampling occurred between 2004 and 2006. Twenty-six USTs were removed, and onsite soils have been remediated. Inline Sediment samples were collected from within the Norfolk CSO/SD system between 2003 and 2005.



Near South SD in LDW: In 2003, Boeing removed approximately 60 cy of PCB-contaminated sediment. Sediment samples were collected from this area in 2004 and 2005.

Between South SD and Norfolk CSO/SD in LDW: Sediment samples were collected in 2002 as part of a Phase I investigation.

Near Norfolk CSO/SD in LDW: Sediment contamination was investigated near the Norfolk CSO/SD outfall in 1994. Sediment near the Norfolk CSO/SD was dredged and backfilled with clean sediment in 1999, followed by 5 years of monitoring.

- Source-tracing sampling location[a]
- Private mainline
- Public mainline
- Public lateral line
- Norfolk SD drainage basin[b]

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > CSL, non-detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2008 SCA boundary
- Subsurface sediment sampling location
- CSO/storm drain
- Permitted private storm drain
- Pipe of unresolved origin and/or use
- Tax parcel
- SCA-associated property[c]
- EAA boundary[d]
- 2008 SCA boundary[e]

Dredged and capped area

- Boeing Developmental Center south storm drain
- Norfolk CSO/SD
- River mile
- Navigation channel

[a] Source-tracing sampling locations were mapped when coordinates were available. Therefore, not all source-tracing samples with chemical data are mapped.

[b] Source: Schmoyer (2008a).

[c] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[d] For the Norfolk early action area, surface sediment data represent samples collected after dredging and capping at the Norfolk CSO/SD removal area in 1999 and before sediment removal and capping at the Boeing Developmental Center south storm drain removal area in 2003. The Norfolk boundary represents the area of remediation actions that have been completed to date. Boundary shown is based on Ecology (2007f).

[e] Boundary shown is based on Ecology and SAIC (2008).

Sources of information for facilities, outfalls, drainage basin, and source-tracing samples: Windward (2003b), Ecology and Environment (2007a), Ecology (2007c), and Schmoyer (2008d).

WindWard environmental LLC

N

0 1,000 2,000 Feet

0 250 500 Meters

Map I-36. Regulatory investigation and remediation status of the Norfolk CSO/SD SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

Lower Duwamish Waterway

Legend

Streets
- Arterials
- State Highway
- Interstate Freeway

Parcel boundary

Building

Storm drain

Sanitary sewer

County interceptor

Pipe cleaned in 2005

Sediment sampling location

50 0 50 100 150 Feet

S NORFOLK ST

Norfolk20

Norfolk21

WSDOT Stormwater Treatment System

MH7

M L KING JR WAY S

MH5

AIRPORT WAY S

NP RR

Ditch

40TH AVE S

MH6

MH1

MH3

MH4

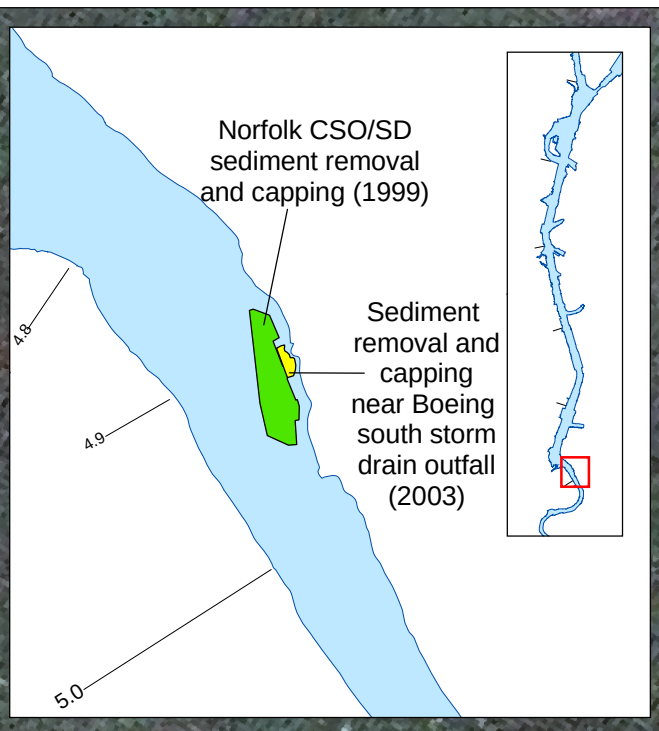
S 104TH PL

To Lower Duwamish Waterway

BN RR

Wind Ward environmental LLC

Map I-37. Norfolk CSO/SD in-line sediment sampling locations



S03
S02
S01
2093, Boeing Developmental Center
2094
NFK-503
NFK-502
NFK-501
NFK-504
2095 – Norfolk CSO/SD
(044), KC/SPU/Boeing

Norfolk monitoring locations
- LDW RI 2006
- Apr-04
- Apr-03
- Apr-02
- Apr-01
- Apr-00
- Oct-99
- Apr-99

Boeing Developmental Center south storm drain monitoring location

Outfall classification
- CSO/storm drain
- Permitted private storm drain
- Pipe of unresolved origin and/or use

Boeing Developmental Center south storm drain removal area (2003)

Norfolk CSO/SD removal area (1999)

For the Norfolk early action area, surface sediment data represent samples collected after dredging and capping at the Norfolk CSO/SD removal area in 1999 and before sediment removal and capping at the Boeing Developmental Center south storm drain in 2003.

Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's National Pollutant Discharge Elimination System (NPDES) permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).

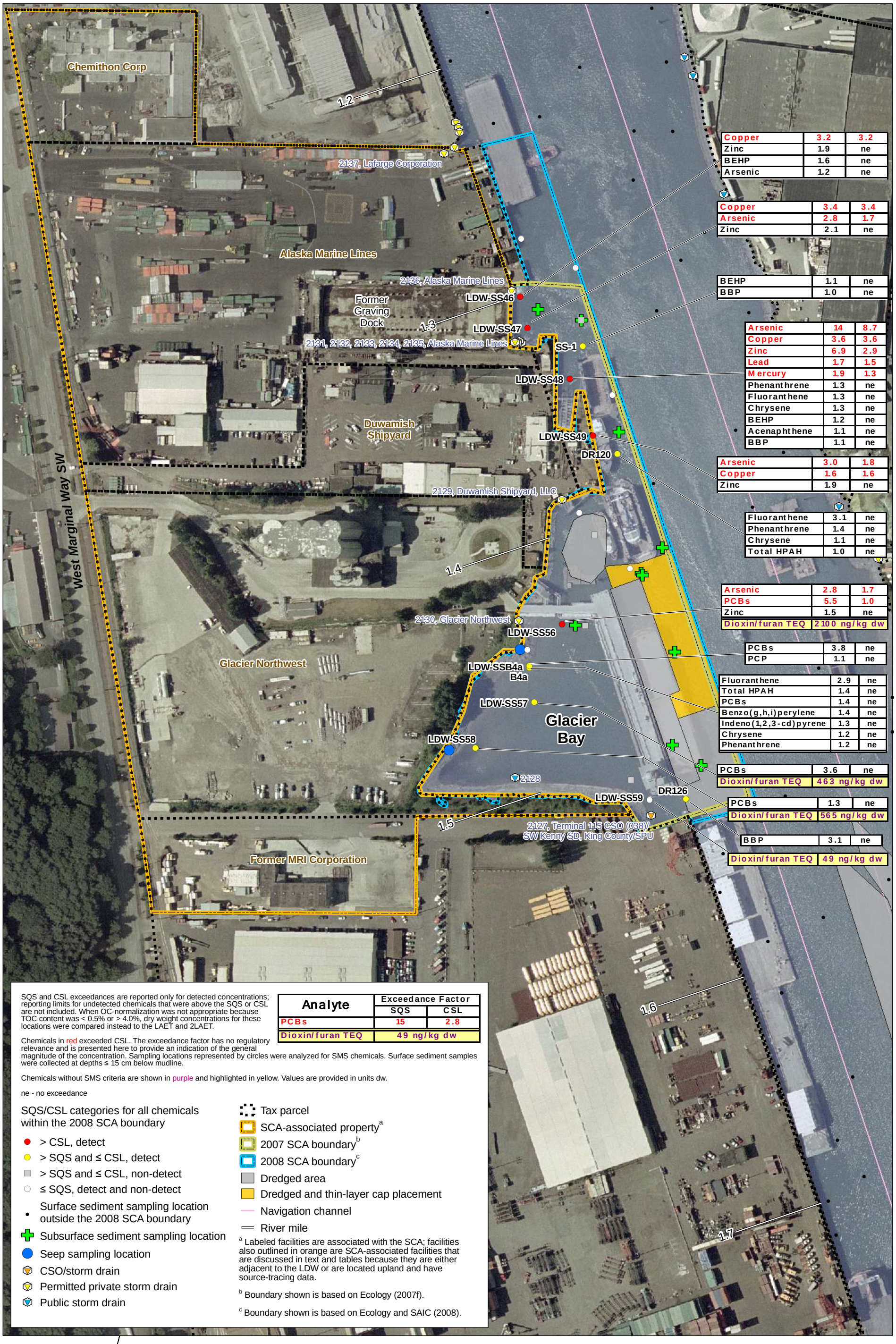
Wind Ward environmental LLC

0 25 50 Feet

0 10 20 Meters

Map I-38. Surface sediment monitoring locations at Norfolk CSO/SD and Boeing Developmental Center South storm drain

Prepared by CEH, 07/13/2010, MAP 2834; W:\Projects\00-08-06_Duwamish_R\data\GIS\Phase2 RI\Source Control\Appendix I



SQS and CSL exceedances are reported only for detected concentrations; reporting limits for undetected chemicals that were above the SQS or CSL are not included. When OC-normalization was not appropriate because TOC content was < 0.5% or > 4.0%, dry weight concentrations for these locations were compared instead to the LAET and 2LAET.

Analyte	Exceedance Factor	
	SQS	CSL
PCBs	15	2.8
Dioxin/furan TEQ	49 ng/kg dw	

Chemicals in red exceeded CSL. The exceedance factor has no regulatory relevance and is presented here to provide an indication of the general magnitude of the concentration. Sampling locations represented by circles were analyzed for SMS chemicals. Surface sediment samples were collected at depths ≤ 15 cm below mudline.

Chemicals without SMS criteria are shown in purple and highlighted in yellow. Values are provided in units dw.

ne - no exceedance

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2008 SCA boundary
- Subsurface sediment sampling location
- Seep sampling location
- CSO/storm drain
- Permitted private storm drain
- Public storm drain
- Tax parcel
- SCA-associated property[a]
- 2007 SCA boundary[b]
- 2008 SCA boundary[c]
- Dredged area
- Dredged and thin-layer cap placement
- Navigation channel
- River mile

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] Boundary shown is based on Ecology (2007f).

[c] Boundary shown is based on Ecology and SAIC (2008).

Wind Ward LLC environmental

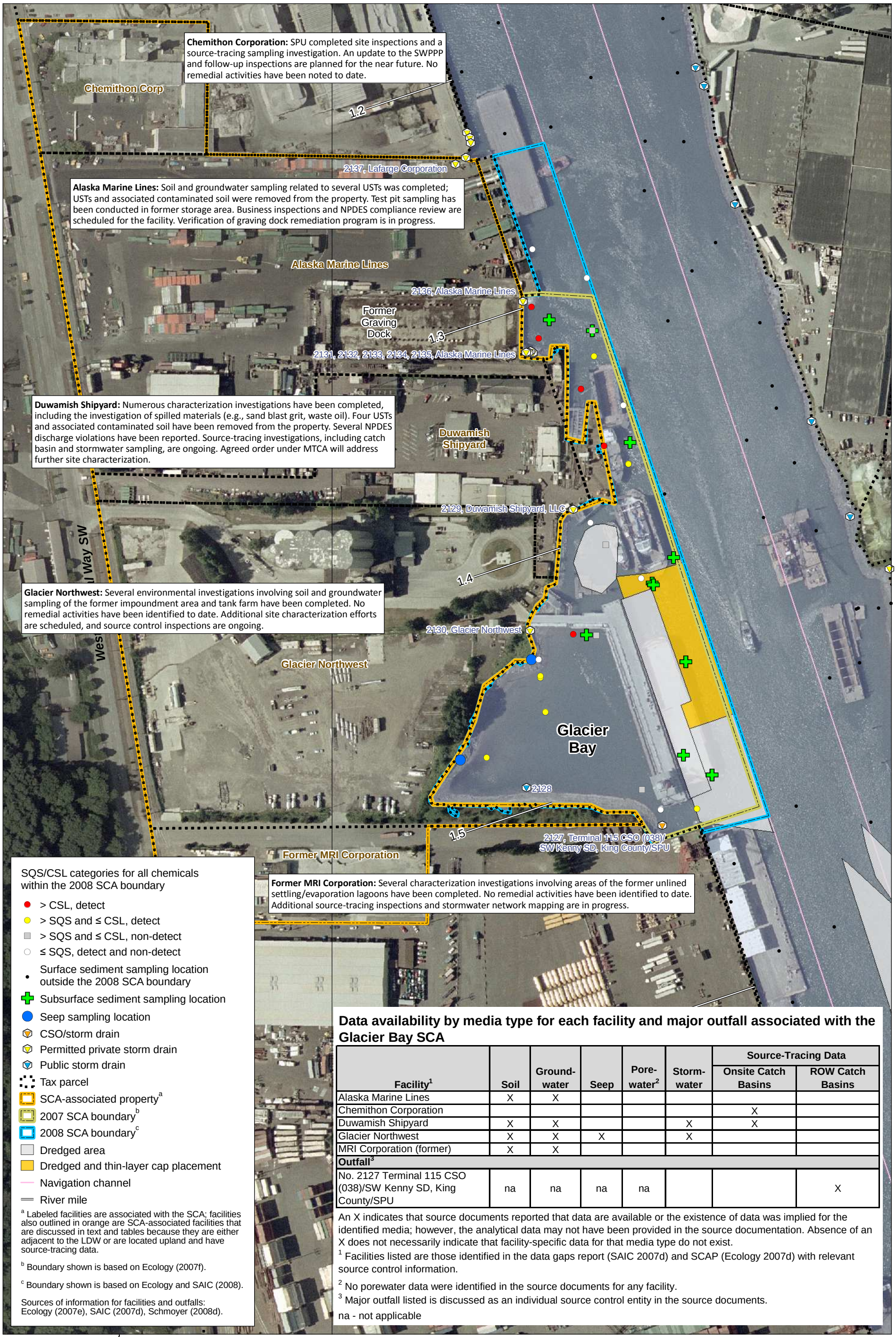
N

0 200 400 Feet

0 50 100 Meters

Map I-39. Surface sediment information for the Glacier Bay SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.



Data availability by media type for each facility and major outfall associated with the Glacier Bay SCA

Facility[1]	Soil	Ground-water	Seep	Pore-water[2]	Storm-water	Source-Tracing Data: Onsite Catch Basins	Source-Tracing Data: ROW Catch Basins
Alaska Marine Lines	X	X					
Chemithon Corporation						X	
Duwamish Shipyard	X	X			X	X	
Glacier Northwest	X	X	X		X		
MRI Corporation (former)	X	X					
Outfall[3]							
No. 2127 Terminal 115 CSO (038)/SW Kenny SD, King County/SPU	na	na	na	na			X

An X indicates that source documents reported that data are available or the existence of data was implied for the identified media; however, the analytical data may not have been provided in the source documentation. Absence of an X does not necessarily indicate that facility-specific data for that media type do not exist.

[1] Facilities listed are those identified in the data gaps report (SAIC 2007d) and SCAP (Ecology 2007d) with relevant source control information.

[2] No porewater data were identified in the source documents for any facility.

[3] Major outfall listed is discussed as an individual source control entity in the source documents.

na - not applicable

WindWard LLC environmental

N

0 200 400 Feet

0 50 100 Meters

Map I-40. Regulatory investigation and remediation status for the Glacier Bay SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

Prepared by CEH, 07/13/2010; MAP #3441; W:\Projects\00-08-06_Duwamish_R\data\gis\Phase2 RI\Source Control\Appendix I

Source-tracing sampling location[a]
Private mainline
Public mainline
Public lateral line
Glacier Bay-SW Kenny SD

SQS/CSL categories for all chemicals within the 2008 SCA boundary

> CSL, detect
> SQS and ≤ CSL, detect
> SQS and ≤ CSL, non-detect
≤ SQS, detect and non-detect
Surface sediment sampling location outside the 2008 SCA boundary

Subsurface sediment sampling location
Seep sampling location
CSO/storm drain
Permitted private storm drain
Public storm drain
Tax parcel
SCA-associated property[b]
2007 SCA boundary[c]
2008 SCA boundary[d]
Dredged area
Dredged and thin-layer placement
Navigation channel
River mile

[a] Source-tracing sampling locations were mapped when coordinates were available. Therefore, not all source-tracing samples with chemical data are mapped.

[b] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[c] Boundary shown is based on Ecology (2007f).

[d] Boundary shown is based on Ecology and SAIC (2008).

Sources of additional information for facilities and outfalls:
Ecology (2007e), SAIC (2007d), Schmoyer (2008d), Windward (2004).

Kellogg I.
0.8
0.9
1.0
1.2
1.3
1.4
1.5
1.6
1.7
1.8
Chemithon Corp
2137, Lafarge Corporation
Alaska Marine Lines
2136, Alaska Marine Lines
Former Graving Dock
2131, 2132, 2133, 2134, 2135, Alaska Marine Lines
Duwamish Shipyard
2129, Duwamish Shipyard, LLC
2130, Glacier Northwest
Glacier Northwest
Glacier Bay
2128
2127, Terminal 115 CSO (038) / SW Kenny SD, King County/SPU
Former MRI Corporation
West Marginal Way SW

City of Seattle SD: ROW catch basin sampling within the drainage basin was completed in 2006. In-line sediment sampling is in progress.

Wind Ward LLC environmental

N

0 400 800 Feet

0 100 200 Meters

Map I-41. Stormwater basin and drainage features for Glacier Bay SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

PCBs	180	23
Mercury	6	4.2
BEHP	3.2	2.2
Lead	1.4	1.2
Zinc	1	ne
Dioxin/furan TEQ	412 ng/kg dw	

PCBs	8.2	1.5
Mercury	2.0	1.4
BEHP	1.8	1.1

PCBs	10	1.8

PCBs	36	4.7
Mercury	3.9	2.7
BEHP	1.8	1.2
BBP	1.4	ne

PCBs	1.4	ne

Douglas Management Company

2120

2118, SPU
Second Avenue S SD

Trotsky/former Northwest Cooperage
(presently Industrial Container Services)

2117, Boyer Logistics, Inc

Vacant

Boyer Towing

S Orchard St

Boyer Towing

Boyer Towing

Trotsky/former Northwest Cooperage
(presently Industrial Container Services)

Wells Trucking & Leasing

Hwy 509/1st Ave Bridge

W Marginal Way S

2nd Ave S

22

23

SQS and CSL exceedances are reported only for detected concentrations; reporting limits for undetected chemicals that were above the SQS or CSL are not included. When OC-normalization was not appropriate because TOC content was < 0.5% or > 4.0%, dry weight concentrations for these locations are compared instead to the LAET and 2LAET.

Analyte	Exceedance	
	SQS	CSL
PCBs	15	2.8
Dioxin/furan TEQ	49 ng/kg dw	

Chemicals in red exceeded CSL. The exceedance factor has no regulatory relevance and is presented here to provide an indication of the general magnitude of the concentration. Sampling locations represented by circles were analyzed for SMS chemicals. Surface sediment samples were collected at depths ≤ 15 cm below mudline.

Chemicals without SMS criteria are shown in purple and highlighted in yellow.

ne - no exceedance

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2008 SCA boundary
- Subsurface sediment sampling location
- Seep sampling location

- EOF
- Permitted private storm drain
- Public storm drain
- Pipe of unresolved origin and/or use
- Tax parcel
- SCA-associated property[a]
- EAA boundary[b]
- 2008 SCA boundary[c]
- Navigation channel
- River mile

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] The EAA boundary shown is based on Ecology (2007f); this boundary is preliminary and has not been finalized by EPA and Ecology.

[c] Boundary shown is based on Ecology and SAIC (2008).

Wind Ward LLC environmental

N

0 50 100 Feet

0 20 40 Meters

Map I-42. Surface sediment information for the Trotsky Inlet SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

Prepared by CEH, 07/13/2010; MAP #3011; W:\Projects\00-08-06 Duwamish R\data\gis\Phase2 RI\Source Control\Appendix I

Data availability by media type for each facility and major outfall associated with the Trotsky SCA

Facility[1]	Soil	Groundwater	Seep	Pore-water[2]	Storm-water	Source-Tracing Data: Catch Basins	Source-Tracing Data: ROW Catch Basins	Source-Tracing Data: Inline Sediment
Boyer Towing, Inc (Parcels 7-9)[3]								
Douglas Management Company			X					
Trotsky	X	X	X					
Wells Trucking and Leasing						X		
Major outfalls[4]								
Second Avenue S SD	na	na	na	na	X		X	X

An X indicates that source documents reported that data are available or the existence of data was implied for the identified media; however, the analytical data may not have been provided in the source documentation. Absence of an X does not necessarily indicate that facility-specific data for that media type do not exist.

[1] Facilities listed are those identifed in the SCAP (Ecology 2007b), data gaps report (SAIC 2007b), or additional site characterization activities report (SAIC 2007a) with relavent source control information.

[2] No porewater data were identified in the source documents for any facility.

[3] No soil, groundwater, seep, porewater, stormwater, or source-tracing data were identified in the source documents for this facility.

[4] Major outfalls listed are those discussed as individual source control entities in the source documentation.

na - not applicable

Hwy 509/1st Ave Bridge

Douglas Management Company

Douglas Management Co.: A cleanup of a LUST was conducted in the 1990s. Additional site characterization will be conducted.

2120

2118, SPU
Second Avenue S SD

Trotsky/former Northwest Cooperage
(currently Industrial Container Services)

Second Avenue S SD: In-line sediment samples have been collected along the Second Avenue S SD line. SPU plans to conduct additional source tracing investigations in 2009.

2117, Boyer Logistics, Inc

Vacant

Boyer Towing

S Orchard St

Boyer Towing (Parcels 7 to 9): SPU conducted source control investigations in 2003. Sediment samples from an O/W separator were collected.

22

Boyer Towing

Boyer Towing

Trotsky/former Northwest Cooperage
(currently Industrial Container Services)

Trotsky: A pretreatment facility was installed around 1970. In 1973, the site was bermed with concrete in response to a spill. A three-phase soil and groundwater assessment was conducted in 1986. A site hazard assessment (including the collection of soil samples and a source-tracing sample) was conducted in 1991. Additional groundwater sampling also was conducted in 1991. A site characterization study was conducted in 2007. Site inspections also have been conducted. An RI/FS will be conducted at the property under a MTCA order. Additional source control investigations may be conducted as part of the RI/FS.

23

W Marginal Way S

2nd Ave S

Wells Trucking and Leasing: SPU inspected the facility in 2002. Catch basins were cleaned in 2002, and catch basin samples were collected in 2003.

Wells Trucking & Leasing

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the 2008 SCA boundary
- Subsurface sediment sampling location
- Seep sampling location

- EOF
- Permitted private storm drain
- Public storm drain
- Pipe of unresolved origin and/or use
- Tax parcel
- SCA-associated property[a]
- EAA boundary[b]
- 2008 SCA boundary[c]
- Navigation channel
- River mile

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] The EAA boundary shown is based on Ecology (2007f); this boundary is preliminary and has not been finalized by EPA and Ecology.

[c] Boundary shown is based on Ecology and SAIC (2008).

Sources of information for facilities and outfalls: SAIC (2007b, c), Ecology (2007b), Schmoyer (2008d), and Windward (2004).

WindWard environmental LLC

N

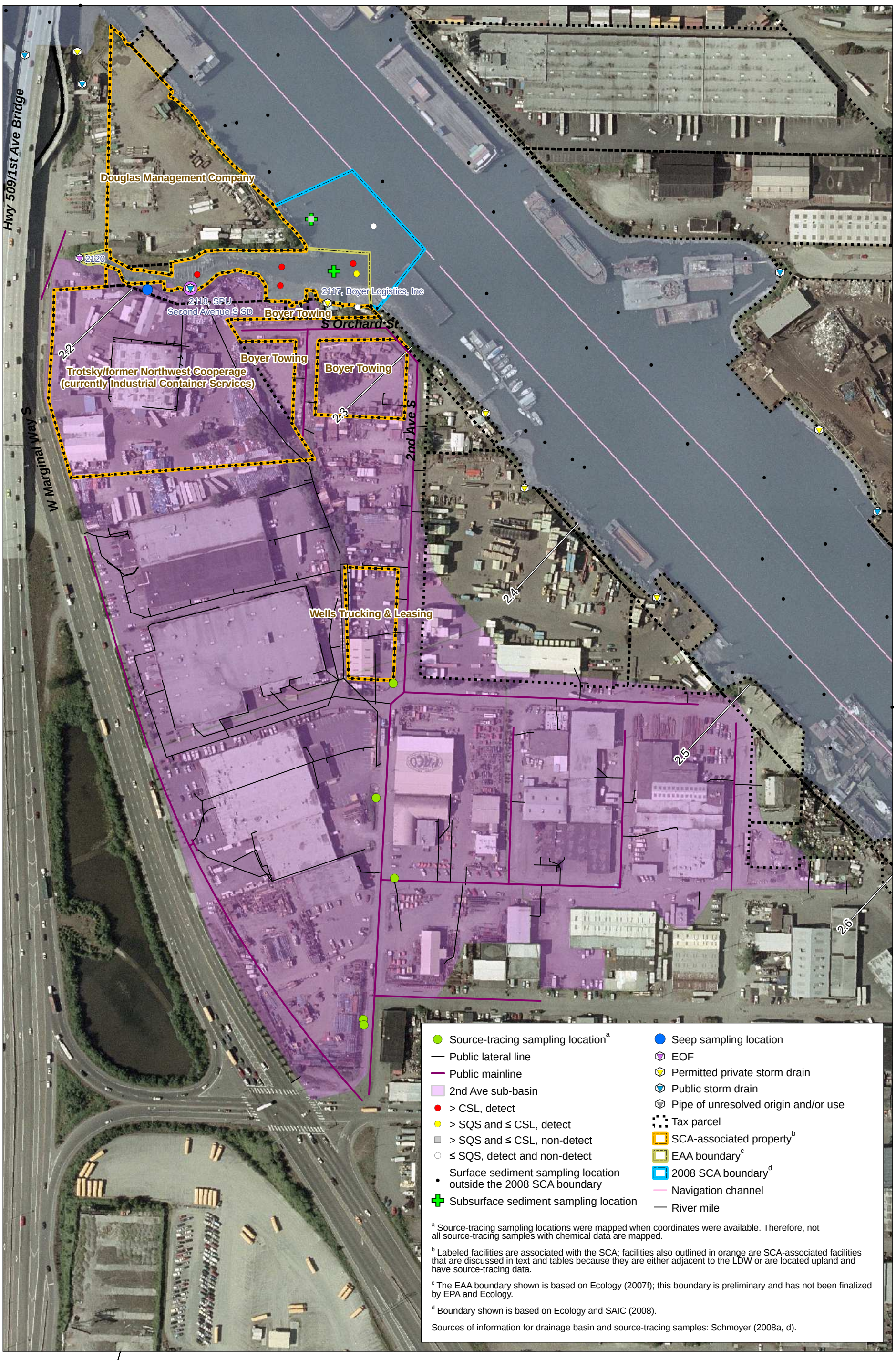
0 50 100 Feet

0 20 40 Meters

Map I-43. Regulatory investigation and remediation status of the Trotsky Inlet SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

Prepared by CEH, 07/13/2010; MAP #3446; W:\Projects\00-08-06_Duwamish_RI\data\gis\Phase2 RI\Source Control\Section 10



[a] Source-tracing sampling locations were mapped when coordinates were available. Therefore, not all source-tracing samples with chemical data are mapped.

[b] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[c] The EAA boundary shown is based on Ecology (2007f); this boundary is preliminary and has not been finalized by EPA and Ecology.

[d] Boundary shown is based on Ecology and SAIC (2008).

Sources of information for drainage basin and source-tracing samples: Schmoyer (2008a, d).

Wind Ward environmental LLC

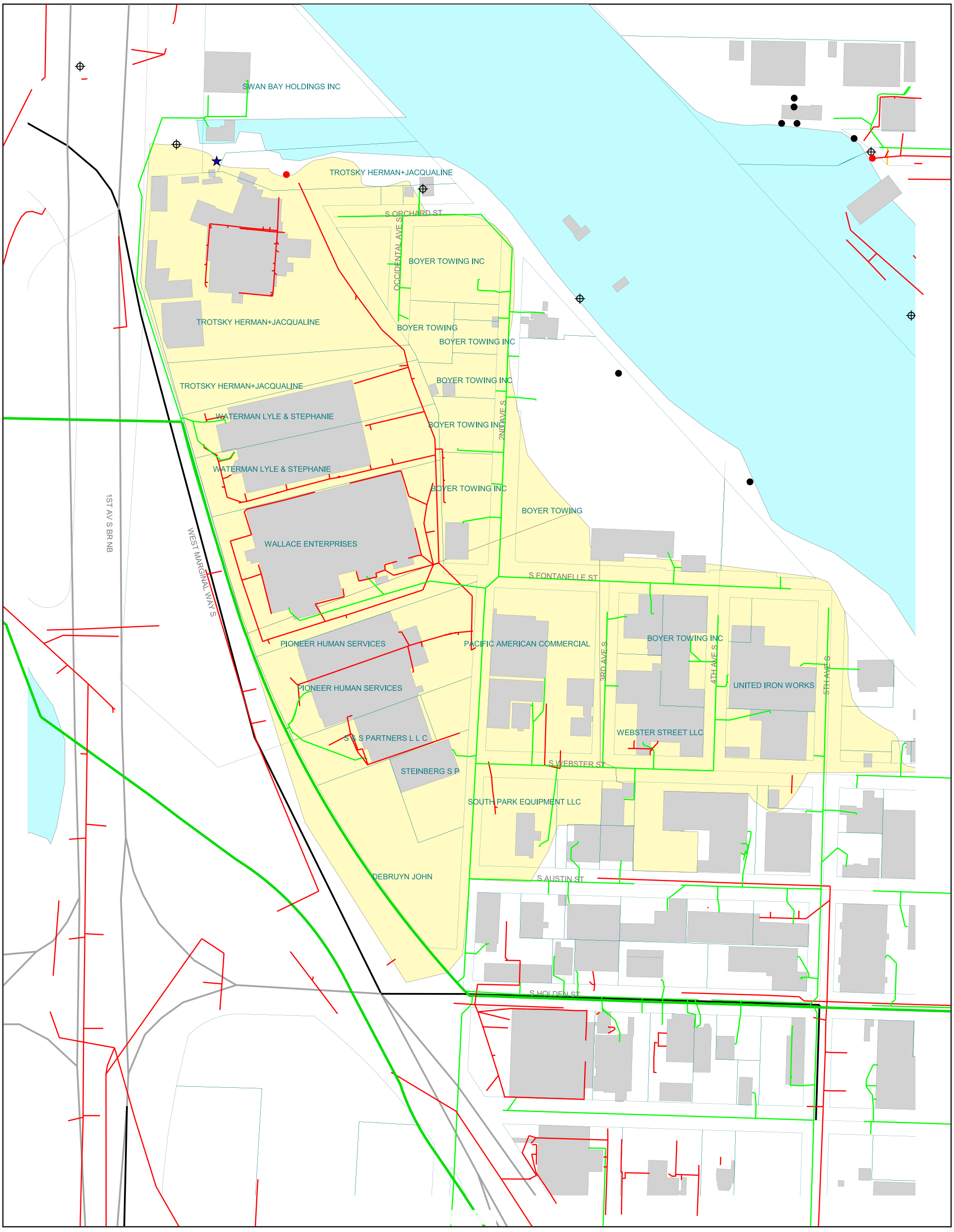
N

0 120 240 Feet

0 40 80 Meters

Map I-44. Drainage basin for the Trotsky Inlet SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.



Source: City of Seattle (2006) as provided in Ecology (2007b)

Legend:

- Outfalls
- Abandoned pipe
- CSO-KC
- CSO/SD-City
- CSO/SD-SPU/KC
- Channel
- Private SD
- SD-City
- SD-KC
- SD-Port
- SD-WSDOT/C
- Seep
- Unk

Unlities

- Storm drain
- Sanitary sewer
- Combined sewer
- King County interceptor
- 2nd Ave S SD basin

100 0 100 200 Feet

Wind Ward environmental LLC

Map I-45. Stormwater basin and drainage features for the Trotsky Inlet SCA

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the EAA
- Subsurface sediment sampling location
- Seep sampling location
- Permitted private storm drain
- Public storm drain
- Pipe of unresolved origin and/or use
- Abandoned
- Not an outfall
- Stream, channel, or swale
- Tax parcel
- SCA-associated property[a]
- EAA boundary[b]
- NTCRA cleanup boundary[b]
- 2008 SCA boundary[c]
- River mile
- Navigation channel

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] The T-117 early action area boundary was identified in the EE/CA as the removal action area contingent upon supplemental sampling. Boundary shown is based on Windward et al. (2008).

[c] Boundary shown is based on Ecology and SAIC (2008).

3.3
3.4
3.5
3.6
3.7
3.8
3.9
South Park Marina
Dallas Ave S
Former Basin Oil
17th Ave S
Former Basin Oil
Terminal 117
S Donovan St
Boeing South Park

Wind Ward LLC environmental

N

0 200 400 Feet

0 50 100 Meters

Map I-46. T-117 SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

PCBs	3.8	ne
Benzyl alcohol	1.3	ne

PCBs	6.4	1.2

PCBs	5.0	ne

PCBs	2.8	ne

PCBs	14	2.6

PCBs	1.5	ne

PCBs	2.6	ne

PCBs	120	22

PCBs	18	3.4

PCBs	46	8.5

PCBs	13	2.5

PCBs	33	6.2
Phenol	4.5	1.6

PCBs	29	5.4

PCBs	32	5.8
Phenol	5	1.8

PCBs	180	34

PCBs	2.9	ne

PCBs	8.3	1.5

PCBs	55	10
Phenol	3.3	1.2

PCBs	74	14

PCBs	20	2.6

PCBs	24	4.5
Phenanthrene	1.4	ne
Acenaphthene	1.1	ne
Indeno(1,2,3-cd)pyrene	1.1	ne

PCBs	19	3.5

PCBs	9.2	1.7

PCBs	6.3	1.2

PCBs	35	6.5

PCBs	13	2.3

PCBs	1.6	ne

PCBs	18	3.4

PCBs	28	5.1

PCBs	1.3	ne

PCBs	2.5	ne

PCBs	17	3.1

PCBs	4.6	ne

PCBs	5.2	ne

PCBs	6.8	1.3

PCBs	1.8	ne

PCBs	5.0	ne

Dibenzofuran	15	3.8
Fluorene	13	3.7
Acenaphthene	13	3.7
PCBs	19	3.5
Phenanthrene	15	3.1
Total LPAH	6.2	2.9
Benzo(a)pyrene	4.2	2.0
Benzofluoranthenes	3.9	2.0
Benzo(a)anthracene	4.0	1.6
2-Methylnaphthalene	1.9	1.2
Fluoranthene	8.1	1.1
Indeno(1,2,3-cd)pyrene	2.9	1.1
Dibenzo(a,h)anthracene	2.8	1.0
Total HPAH	4.7	ne
Chrysene	3.7	ne
Benzo(g,h,i)perylene	2.0	ne
Anthracene	1.0	ne

Analyte	Exceedance Factor	
	SQS	CSL
PCBs	15	2.8

SQS and CSL exceedances are reported only for detected concentrations; reporting limits for undetected chemicals that were above the SQS or CSL are not included. When OC-normalization was not appropriate because TOC content was < 0.5% or > 4.0%, dry weight concentrations for these locations are compared instead to the LAET and 2LAET.

Chemicals in red exceeded CSL. The exceedance factor has no regulatory relevance and is presented here to provide an indication of the general magnitude of the concentration. Sampling locations represented by circles were analyzed for SMS chemicals. Surface sediment samples were collected at depths ≤ 15 cm below mudline.

ne - no exceedance

*Co-located surface and subsurface sampling station using same sample ID

SQS/CSL categories for all chemicals within the 2008 SCA boundary

- > CSL, detect
- > SQS and ≤ CSL, detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the EAA
- Subsurface sediment sampling location
- Seep sampling location
- Permitted private storm drain
- Public storm drain
- Pipe of unresolved origin and/or use
- Abandoned
- Not an outfall
- Stream, channel, or swale
- Tax parcel
- SCA-associated property[a]
- EAA boundary[b]
- NTCRA cleanup boundary[b]
- 2008 SCA boundary[c]
- River mile
- Navigation channel

[a] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[b] The T-117 early action area boundary was identified in the EE/CA as the removal action area contingent upon supplemental sampling. Boundary shown is based on Windward et al. (2008).

[c] Boundary shown is based on Ecology and SAIC (2008).

T-117 drainage basin (source: Schmoyer 2008a)

0 125 250 500 Feet

0 50 100 Feet

0 20 40 Meters

Map I-47. Surface sediment and drainage basin information for the T-117 SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
Outfalls shown were identified during a City of Seattle low-tide survey in 2003 (Herrera 2004). Some locations were initially identified using drainage maps from Ecology's NPDES permit files and other relevant agency databases. These locations were later surveyed in the field. Review of agency files and interviews with agency and LDWG personnel provided additional outfall-specific information. Some locations were field-verified by LDWG members; some additional outfall locations were identified during these subsequent verifications. The outfall layer is meant to serve as a snapshot of outfall conditions at the time the survey was completed (2003).
Tax parcel information was provided in 2008 by SPU and King County. Some tax parcel polygons were edited to conform to the LDW shoreline presentation. A comprehensive survey of property owner records was not conducted.

Prepared by CEH, 07/13/2010; MAP #3007; W:\Projects\00-08-06_Duwamish_RI\data\GIS\Phase2 RI\Source Control\Appendix I

Data availability by media type for each facility and major outfall associated with the T-117 SCA

Facility[1]	Soil	Ground-water	Seeps	Pore-water[2]	Storm-water	Source-Tracing Data: Onsite Catch Basins	Source-Tracing Data: ROW Catch Basins
Basin Oil	X	X					
Boeing South Park	X						
City of Seattle Street ROW (Dallas Ave Vicinity)	X				X		X
South Park Marina	X	X					
Terminal 117	X	X	X			X	
Major Outfalls[3]							
Port of Seattle SD (No. 2212)[4]	na	na	na	na			
Port of Seattle SD (No. 2209)[4]	na	na	na	na			
Public SD (No. 2215)[4]	na	na	na	na			
South Park Marina permitted private SD (No. 2214)[4]	na	na	na	na			
Boeing South Park permitted private SDs (Nos. SP-4 and SP-5)[4]	na	na	na	na			

An X indicates that source documents reported that data are available or the existence of data was implied for the identified medium; however, the analytical data may not have been provided in the source documentation. Absence of an X does not necessarily indicate that facility-specific data for that media type do not exist.

[1] Facilities are adjacent properties listed in the SCAP (Ecology 2005) and data gaps report (Windward et al. 2003) with relevant source control information.

[2] No porewater data were identified in the source documents for any facility.

[3] Major outfalls listed are those discussed as individual source control entities in the source documents.

[4] No stormwater or source-tracing data were identified for this outfall in the source documents.

na - not applicable

Public SD (No. 2215): No source-tracing investigations have been reported.

South Park Marina: Soil and catch basin sampling as well as water quality and stormwater compliance inspections have been conducted.

South Park Marina permitted private SD (No. 2214): No source-tracing investigations have been reported.

City of Seattle Street ROW (Dallas Avenue Vicinity): Soil and street dust samples were collected, leading to the performance of interim and cleanup actions. Stormwater and catch basin sediment monitoring has also been completed. Streets have been restored, contaminated soils have been removed from the streets and residential yards, and new SDs and catch basins have been installed.

Port of Seattle SD (No. 2212): No source-tracing investigations have been reported.

T-117: Several groundwater, soil, and sediment sampling events have been conducted within T-117. Investigations have been conducted to identify potential sources of recontamination. Soil has been removed from multiple areas around T-117, and a UST was removed. Site characterization and hazard assessments also have been completed in preparation of various removal actions.

Port of Seattle SD (No. 2209): No source-tracing investigations have been reported.

Basin Oil: Several environmental investigations related to dangerous waste compliance inspections and site visits have been conducted. Remedial actions conducted thus far have included adding gravel to disturbed areas, installing a silt fence, removing tanks.

Boeing South Park: An initial site characterization has been conducted.

Boeing South Park permitted private SDs (Nos. SP-4 and SP-5): No source-tracing investigations have been reported.

- Source-tracing sampling location[a]
- T-117 drainage basin

SQS/CSL categories for all chemicals within the 2008 SCA boundary

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- > SQS and ≤ CSL, detect
- > SQS and ≤ CSL, non-detect
- ≤ SQS, detect and non-detect
- Surface sediment sampling location outside the EAA
- Subsurface sediment sampling location
- Seep sampling location
- EOF/storm drain
- Permitted private storm drain
- Public storm drain
- Pipe of unresolved origin and/or use
- Abandoned
- Not an outfall
- Stream, channel, or swale
- Tax parcel
- SCA-associated property[b]
- EAA boundary[c]
- NTCRA cleanup boundary[c]
- 2008 SCA boundary[d]
- River mile
- Navigation channel

[a] Source-tracing sampling locations were mapped when coordinates were available. Therefore, not all source-tracing samples with chemical data are mapped.

[b] Labeled facilities are associated with the SCA; facilities also outlined in orange are SCA-associated facilities that are discussed in text and tables because they are either adjacent to the LDW or are located upland and have source-tracing data.

[c] The T-117 early action area boundary was identified in the EE/CA as the removal action area contingent upon supplemental sampling. Boundary shown is based on Windward et al. (2008).

[d] Boundary shown is based on Ecology and SAIC (2008).

Sources of information for facilities and outfalls: Windward et al. (2003, 2004; 2008), City of Seattle (2004), SAIC (2008c), Schmoyer (2008d), and SECOR (1998), as cited in Windward et al. (2003)

Wind Ward LLC environmental

N

0 200 400 Feet

0 50 100 Meters

Map I-48. Regulatory investigation and remediation status of the T-117 SCA

Photo source: USGS High-Resolution Orthoimage, Seattle/Tacoma, WA, USGS, 2003. Distributed by King County GIS. Photo date 06/11/2002.
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