Lower Duwamish Waterway Group

Port of Seattle / City of Seattle / King County / The Boeing Company

WATERWAY USER SURVEY AND ASSESSMENT OF IN-WATER STRUCTURES

Work Plan

Prepared for:

U.S. Environmental Protection Agency
Region 10

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ACRONYMS AND ABBREVIATIONS

AIS	automatic identification system
AOC	administrative order on consent
CBI	confidential business information
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
EPA	U.S. Environmental Protection Agency
FS	feasibility study
GIS	geographic information system
GPS	global positioning system
HSP	health and safety plan
Integral	Integral Consulting Inc.
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
MTCA	Model Toxics Control Act
NOAA	National Oceanic and Atmospheric Administration
PII	personally identifiable information
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RI/FS	remedial investigation and feasibility study
ROD	record of decision
SOW	scope of work
USACE	U.S. Army Corps of Engineers

1 INTRODUCTION

In 2000, the City of Seattle, King County, the Port of Seattle, and The Boeing Company, working collectively as the Lower Duwamish Waterway Group (LDWG), agreed in an administrative order on consent (AOC) to conduct a remedial investigation and feasibility study (RI/FS) for the Lower Duwamish Waterway (LDW), with oversight by the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology. In September 2001, the LDW was formally listed as a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund) site; in February 2002, the LDW was formally listed as a Washington Model Toxics Control Act (MTCA) site. The remedial investigation (RI) was completed in 2010 (Windward 2010) and the feasibility study (FS) was completed in 2012 (AECOM 2012). A record of decision (ROD) was issued by EPA in 2014 (EPA 2014).

A third amendment to the AOC (EPA 2016) specified pre-design studies to "help EPA ensure that all remedial design data needs are addressed in the appropriate sequence and without delay" to advance the implementation of the ROD.

In accordance with Task 7 of the third amendment scope of work (SOW), this document presents the work plan for conducting the LDW waterway user survey and assessment of in-water structures. The survey and assessment and the resulting data report will be completed in accordance with this work plan and the requirements of Task 8 of the SOW. A separate report to be prepared under Task 9 of the SOW, the recovery category recommendations report, will include an analysis of the data from this survey and assessment, and provide related remedial design considerations and recommendations. Descriptions of the other tasks being accomplished under the SOW, including Task 9, can be found in the pre-design studies work plan (Windward et al. 2017).

1.1 BACKGROUND

The LDW FS (AECOM 2012) defined recovery categories to facilitate the assignment of remedial technologies to specific areas of the site. The recovery categories were based on the potential for sediment contaminant concentrations to be reduced through natural recovery, or for subsurface contamination to be exposed at the surface due to physical processes (i.e., erosion and scour). Based on these categories and other considerations, capping and dredging were assigned to areas with less potential for natural recovery and a higher likelihood of scour or other disturbance. Enhanced natural recovery and monitored natural recovery were assigned to areas where disturbance is less likely and recovery is predicted to occur. The defined recovery categories, and the criteria upon which they were developed, are presented in Table 23 of the ROD, titled "Criteria for Assigning Recovery Categories" (EPA 2014).

1.2 SURVEY AND ASSESSMENT OBJECTIVES

The primary objective of the survey and assessment is to gather physical information that will inform recommended changes to recovery category designations and technology assignments (EPA 2016). Specifically, the survey and assessment will focus on collection of data related to physical conditions—one of three lines of evidence considered in the determination of recovery categories in the ROD. The remaining two lines of evidence (sediment transport and contaminant trend characteristics) will be reviewed, as needed, during remedial design. Final technology assignments at each location will be determined during remedial design, based on location-specific design data and the decision criteria identified in the ROD.

The survey and assessment will build on existing waterway data and analyses presented in the LDW FS to develop a better understanding of current and potential future waterway activities. The new data will be used to update the geographic information system (GIS) data and maps provided in the FS related to waterway use, structures, berthing areas, areas of vessel scour, dredging activities, and property ownership.

The waterway user survey will focus on gathering information regarding waterway uses and current and future activities with the potential to disturb the sediment bed to a degree that impacts the recovery potential (and recovery category designation) of a given area. Such activities may include, but not be limited to, maneuvering and anchoring of ships and barges, spud use, dragging of bridle chains, and future berth and wharf development and maintenance projects.

Activities that do not represent a substantive risk of disturbance to designated recovery areas (e.g., small recreational vessels operations, tribal fishing, residential dock activity, clamming, and other activities that may result in localized impacts to the sediment bed) are not a focus of this task. However, organizations that represent or manage these activities will be contacted to verify the nature of their respective current and future uses and the potential impacts to the sediment bed associated with these uses, if any (Section 2.3.1). Information that is collected regarding such waterway activities will be documented for further consideration during remedial design to assess the need for location-specific design modifications, construction constraints, and/or use restrictions.

Another objective of this task is to perform an assessment of in-water structures. The assessment of in-water structures will be used to confirm and support the interpretation of the user survey to help determine recovery category recommendations. The assessment will also identify locations where current structural conditions or planned future modifications present access restrictions (e.g., under-pier areas and areas near dolphins/pilings, bulkheads, and riprapped or engineered shorelines) that may affect sampling, cleanup technology application, or remedial design and construction details. This information will also be used to update Figures 1(a-f), which present a preliminary identification of waterway structures, berthing

areas, and property ownership based on GIS data provided in the FS and other readily available sources of information.

In addition, the findings from the survey and assessment will serve as a resource for certain remedial design and construction planning tasks, including:

- Vessel management during future sampling and construction activities
- Potential location-specific use restrictions that would prohibit activities that may damage caps
- Potential location-specific use restrictions and technology assignments that would allow for fewer restrictions on the use of certain areas.

A summary of the data to be collected during the survey and assessment, and the potential use of the data, is provided in Table 1.

Table 1. Anticipated Use of Waterway User Survey and In-Water Structures Assessment Data

	Data Use			Data Collection Methods				
Data [a]	To Inform Task 9 Recovery Category Recommendations [a]	To Inform Technology Assignments During Remedial Design	To Inform Remedial Design Details and/or Remedial Action Construction Activities	GIS / Photogrammetric Analyses	Readily Available Public Information	AIS Database Analysis	Waterway User Survey	Assessment of In-Water Structures
Waterway Uses and Operations								
Use classification (commercial, public, tribal, etc.) [b]				✓	✓		✓	✓
Vessel characteristics		✓	✓		✓	✓	✓	✓
Navigation, maneuvering, berthing areas	✓	✓	✓	✓		✓	✓	✓
Anchoring, spudding, chain drag	✓	✓	o	✓			✓	✓
Tribal fishing	✓	✓	✓				✓	✓
User-identified access constraints	✓	✓	✓				✓	
Anticipated Future Uses/Projects								
Navigation dredging, deepening	✓	✓	o	✓	✓		✓	
New waterfront development	✓	✓	o		✓		✓	
Structure maintenance, demolition	✓	✓	o		✓		✓	✓
Operational modifications (different vessels, berthing areas, etc.)	✓	✓	o		✓		✓	
Waterway Features								
Overwater piers	✓	✓	✓	✓			✓	✓
Berthing areas	✓	✓	✓	✓			✓	✓
Bulkheads	✓	✓	✓	✓			✓	✓
Dolphins/piles	✓	✓	✓	✓			✓	✓
Riprapped/engineered shorelines	✓	✓	✓	✓			✓	✓
Observed access constraints	✓	✓	✓	✓			✓	✓

Notes:
✓ = indicates intended use
o = indicates possible use
AIS = automatic identification system
GIS = geographic information system

[a] Data collected through the waterway user survey and assessment of in-water structures will focus on collection of data related to physical conditions—one of three lines of evidence considered in the determination of recovery categories in the record of decision. The remaining two lines of evidence (sediment transport and contaminant trend characteristics) will be analyzed, as needed, during remedial design.

[b] Data collected for information purposes only.

2 SURVEY AND ASSESSMENT APPROACH

The following sections describe roles, responsibilities, and the outlined approach for conducting the survey and assessment (Figure 2).

2.1 ROLES AND RESPONSIBILITIES

Under the oversight of the EPA, LDWG and its consultants will conduct the survey and assessment in accordance with the AOC amendment (EPA 2016). EPA will coordinate with the Muckleshoot and Suquamish Tribes regarding the work covered under this work plan. The Washington State Department of Ecology, the Tribes, and LDW stakeholders (e.g., Duwamish River Cleanup Coalition Technical Advisory Group and the National Oceanic and Atmospheric Administration [NOAA]) are participating in the review of the work and related deliverables produced under this task in accordance with the review process established by EPA for the pre-design studies (Windward et al. 2017).

Windward Environmental LLC will provide consultant team leadership, project management, and coordination of communication and deliverables between LDWG and EPA. Integral Consulting Inc. (Integral) will lead the implementation of the survey and assessment, under the supervision of a professional engineer licensed in the State of Washington. Moffatt & Nichol will assist with performance of the user survey and structures assessment, and compilation and interpretation of results. Convergent Pacific LLC will perform a global positioning system (GPS) survey of the accessible in-water structures.

2.2 COMPILATION AND REVIEW OF EXISTING INFORMATION

A compilation and review of readily available information will be performed as the initial step of the survey and assessment. Information regarding known current and future waterway users and respective uses, structures, vessel maneuvering and berthing practices, dredging activities, and scour areas will be used, in conjunction with the LDW FS, to develop working maps and a geodatabase to support the survey and assessment. Potentially relevant information sources and their anticipated use are listed in Table 2.

As part of this step, GIS data from the LDW FS will be overlaid on current high-resolution, georeferenced aerial photographs to identify areas where current conditions (e.g., presence of new structures, removal of existing structures, type and extent of shoreline armoring) are different than the 2012 LDW FS in-water structures data. This photogrammetric comparison will help inform in-person interviews and focus the acquisition of new data needed to update existing maps of waterway structures. GIS information will also be updated with early action area as-built information where applicable (e.g., Slip 4), including shoreline and structure modifications, capped and enhanced natural recovery areas, and regulated navigation areas.

Table 2. Potential Sources of Waterway Information

Data Sources	Data Use				
	Identification of Waterway Users	Identification of Navigational Users	Identification of Structures	Vessel Maneuvering and Berthing	Potential Future Development
Reports / Documents					
LDW final feasibility study	✓	✓	✓	✓	
Long-term capital plans and budgets [a]					✓
DMMP applications		✓			✓
EAA as-built documents	✓	✓	✓	✓	
Aerial Photos / Maps / GIS					
Google Maps / Bing Maps	✓	✓	✓		
Google Earth			✓	✓	
USDA / NOAA high-resolution aerial photos			✓		
NOAA navigation charts			o	o	
Miscellaneous Databases					
King County tax parcels	✓				
USACE navigation data center [b]	✓	✓	✓		
Moffat & Nichol database of AIS information [c]		✓		✓	
USACE permits (Seattle district) [d]		✓			✓

Notes:
✓ = indicates intended use
o = indicates possible use
AIS = automatic identification system
DMMP = Dredged Material Management Program
EAA = early action area
GIS = geographic information system
LDW = Lower Duwamish Waterway
NOAA = National Oceanic and Atmospheric Administration
USACE = U.S. Army Corps of Engineers
USDA = U.S. Department of Agriculture

[a] For Port of Seattle, King County, City of Seattle, and USACE
[b] http://www.navigationdatacenter.us/ports/ports.htm
[c] https://www.navcen.uscg.gov/?pageName=AISmain
[d] http://www.nws.usace.army.mil/Missions/Civil-Works/Regulatory/Permit-Decisions-Appeals/

2.3 WATERWAY USER SURVEY

Waterway users will be contacted following approval of this work plan to develop a more accurate and detailed understanding of their waterway use, if any. Specific focus will be placed on gathering information regarding activities that have the potential to disturb the sediment bed on a spatial scale that will affect the assigned recovery category or technology assignment. This section describes the process through which waterway users will be identified, contacted, and, as needed, interviewed.

2.3.1 Identification of Users

For the purposes of coordinating and performing the survey, four categories of waterway users have been defined. The process by which each user type is to be included in the survey is outlined in the following sections.

2.3.1.1 Waterway-Dependent Users

Waterway-dependent users is a category of LDW users whose operations are more likely to be associated with larger-size vessel traffic and, therefore, have the potential to disturb the sediment bed on a spatial scale that will affect the assigned recovery category or technology assignment. This category of use includes waterfront property owners and tenants with water-dependent uses that are supported by shoreline infrastructure (e.g., docks, piers, wharves, berthing areas). An example is an industrial facility that has a shoreline pier and associated berthing areas to facilitate shipment of materials via water.

This category also includes operators of large vessels and barges, including commercial tug, barge, and cargo vessel operators, as well as federal agencies (i.e., NOAA and USACE) that may or may not have permanent waterfront facilities.

The activities associated with waterway-dependent users are the primary focus of the survey, and these users will be asked to participate in interviews according to the process described in Section 2.3.2. In addition, regulatory agency site managers for all waterfront properties subject to state or federal cleanup activities (i.e., MTCA, CERCLA, or Resource Conservation and Recovery Act [RCRA]) will also be interviewed according to the process described in Section 2.3.2.

2.3.1.2 Recreational Use Businesses/Associations

For the purposes of this survey, this category includes businesses, associations, or public entities involved in activities that present potential minor, isolated, infrequent, or surficial sediment bed disturbance occurrences (e.g., small-craft recreational user associations).

Such businesses or associations will be contacted, by phone, to verify the nature of their current activities, identify any planned future changes, and obtain contact information for potential future coordination during design and construction. Individual recreational users will not be contacted. It is not anticipated that interviews will be arranged with recreational use businesses/associations.

2.3.1.3 Owners of Residential and Waterfront Properties without Water-Dependent Facilities

This category captures all property owners and tenants without apparent water-dependent facilities and those that own residential properties (with or without minor waterfront structures such as docks and piers).

Users in this category will be contacted in writing (i.e., by letter). In the letter, owners will be asked to provide information that will help verify the current use of their property (e.g., office building, residence) and offer any information regarding known future plans to develop their property in a manner that changes its waterfront, including the approximate nature and timing of such modification, if planned. Owners will have the option to respond in the manner that is most convenient to them (i.e., letter, phone call, or e-mail). Owners whose responses indicate probable uses or planned future projects with potential to alter the existing shoreline or sediment bed configuration on a scale that may affect a given recovery area will be added to the list of waterway users to be interviewed.

2.3.1.4 Tribes

Representatives for the Muckleshoot and Suquamish Tribes will be contacted to assess general fishing practices. All contact with the Tribes will be performed in coordination with EPA, who will be responsible for following policies and procedures that address federal trust responsibilities. Individual Tribal members will not be contacted. While Tribal fishing practices are not expected to affect recovery category designations, information regarding the practices will need to be considered for certain design and construction planning details (e.g., consideration of tie-off locations).

2.3.1.5 Preliminary List of Users Included in This Survey

A preliminary list of waterway users, organized into the categories described above, is provided in Attachment 1. The list shown in Attachment 1 is based on the compilation and preliminary review of readily available tax parcel records, aerial photographs, internet research, and personal observations. This preliminary categorization is intended to help facilitate the communication processes described above, and the list is expected to evolve as the survey progresses and more direct information is gathered through outreach efforts. For example, the list may be updated to include additional users that were not initially identified based on

readily available information, or the removal of users who no longer use the waterway. The final list of users contacted will be included in the report summarizing the activities and results of the survey.

2.3.2 Performance of In-Person Interviews

The in-person interviews will focus on developing a more detailed understanding of vessel types, maneuvering, berthing, other potential bottom-disturbing activities, and planned future changes in waterway operations and infrastructure.

Waterway-dependent users that have been identified for interviews will be contacted via telephone and/or e-mail to identify appropriate contacts and discuss the interview process, preferences for information exchange (e.g., in person, telephone, electronic, combination), and scheduling. A list of discussion topics and questions to be asked by the interview team (Attachment 2) will be provided to users (electronically or by mail) in advance of the scheduled interview to give users a general understanding of the information that will be requested and discussed. As discussed below and in Attachment 2, responses to these questions will be noted by the interview team during the interview. Interviews with owners and tenants of waterfront facilities, or their delegates, will be approximately 1 to 2 hours in duration. The interviews will be performed onsite when possible to allow direct observation of the facilities and operations. For interviews with regulatory agency site managers (i.e., MTCA, CERCLA, or RCRA), it is anticipated that a joint meeting will be held with all managers from a given agency.

Interviews with Tribal fisheries representatives will be coordinated by EPA, who, in addition to ensuring policies and procedures that address federal trust responsibilities are followed, will also coordinate in advance with the Tribes to determine appropriate discussion topics and questions for Tribal fisheries representatives. EPA will also determine the appropriate manner for reporting any information that may be provided.

The interview team will focus on gaining an understanding of waterway uses relative to specific areas of the waterway and the associated recovery area and technology assignments, as identified in the ROD. These current recovery category boundaries and technology assignments will, in turn, be subject to refinement based on the findings of the survey and assessment and on future remedial design analyses.

A two-person team composed of staff from Integral and Moffatt & Nichol will conduct the in-person interviews. The team members will have an understanding of general LDW users, facilities, and operations, and the potential relevance of this information to the recovery categories and technology assignments identified in the ROD. To the extent practicable, the same two team members will conduct all the interviews to provide consistency in both the interviews and the information gathered. Team members will arrive prepared with pertinent supplies and materials, including a copy of the ROD, aerial figures, a GPS device, and a camera

(where photographs are permitted by the owner/tenant). Discussions with each waterway user, including responses to applicable interview questions (Attachment 2), will be documented by the interview team and will be retained in the project files together with any additional field notes. Any needed follow-up from the interviews will be performed via telephone and/or e-mail to answer questions that may arise and to gather supplemental information (Section 2.3.3).

2.3.3 Data Gathering

During the initial outreach and interview coordination process, waterway users will be asked for any readily available relevant information that they may be permitted to share. Of particular interest will be information and documentation pertaining to current and future waterway operations (e.g., berthing, anchoring) and any planned waterfront development or improvement projects. Dredge records for establishment and maintenance of berthing areas will be requested, including authorized dredge depths and limits. Facility owners and tenants will also be queried for general structural information (i.e., conceptual, design, or as-built documents) to support identification of the structure location, type, key structural features, and other information potentially relevant to remedial design and construction activities. During in-person interviews, users will be asked to discuss future development plans or other plans to modify/change their existing waterway-dependent uses. It is expected that such supporting information will vary in content, depending on owner preferences, confidentiality, or other business concerns.

To support this work, 1 year of publicly available commercial vessel traffic data obtained from the automatic identification system (AIS) will be compiled for the LDW as part of the compilation and review of existing data (Section 2.2). The AIS data will provide a baseline understanding of vessel traffic patterns and will aid in the interpretation and use of information collected during interviews. The AIS will support tabulation of vessel frequencies (e.g., by type/size) and preparation of plan-view GIS overlays of vessel movement. This information will be evaluated to verify and assess traffic to/from particular facilities along the waterway and possible berthing patterns. U.S. Coast Guard regulations for AIS data apply only to self-propelled vessels. Thus, tugboat operators report AIS data, but barge operators do not. While it is sometimes possible to draw conclusions about barge traffic based on tug traffic, these data are typically less precise than for other vessels. Therefore, it is anticipated that an understanding of barge traffic may be best assessed through interviews with facility and tugboat operators.

2.3.4 Handling of Personally Identifiable Information and Confidential Business Information

Personally identifiable information (PII) refers to information that could be used to distinguish or trace an individual's identity. In performance of the waterway user survey, only relevant

and necessary information will be collected, in accordance with the Privacy Act of 1974 (5 U.S.C. § 552a). Aside from individual contact names, the team will not collect any PII, including home phone number, address, and personal e-mail address, unless absolutely necessary for communications (i.e., for private property owners). This information will be documented on phone call records and interview forms that will remain in the project files. No other PII will be collected, and all PII will be excluded from project reports, memos, etc. All surveyors or persons in contact with PII will be instructed on rules and requirements of handling PII (5 U.S.C. § 552a).

Confidential business information (CBI) is broadly defined as any proprietary information (e.g., trade secrets, operations, processes, sales, shipments, customers, inventories) developed or acquired by a business which, if disclosed publicly, is likely to harm the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained (40 CFR Part 2 Subpart B). All participants will be advised (before the survey begins) that their participation in the waterway user survey and the degree to which they share information/documentation is strictly voluntary. In addition, businesses will be encouraged to withhold CBI from the interview team. At the conclusion of interviews, businesses will be provided an opportunity to consider whether any of the information they provided could be considered CBI. Any CBI that is shared with the interview team will be clearly marked as such and will be retained in the project files, but will not be included in project reports, memos, etc. All surveyors or persons who have custody or possession of business information shall take appropriate measures to properly safeguard such information and to protect against its improper disclosure (40 CFR Part 2 Subpart B).

2.4 ASSESSMENT OF IN-WATER STRUCTURES

A reconnaissance-level survey and physical assessment of in-water structures will be conducted to 1) support the interpretation of information obtained from the user survey and 2) identify locations where structural or access restrictions (e.g., under-pier areas and areas near dolphins/pilings, bulkheads, and riprapped or engineered shorelines) may influence future sampling activities or remedial design.

The location of and physical assessment of the following readily observed in-water structures will be recorded as part of the assessment:

- Wharves, piers, docks, or other over-water structures
- Pilings and dolphins
- Bulkheads, and riprapped or engineered shorelines
- Large outfalls (typically >36 inches) with engineered aprons, wingwalls, or similar appurtenances, where accessible and observable given the tides.

The location of every observable outfall in the LDW has been surveyed as part of the RI/FS and is depicted on existing GIS layers. Each outfall within an area of active sediment remediation will receive appropriate engineering evaluations during remedial design. If large outfalls are observed during the assessment, they will be noted.

2.4.1 Notifications

When in-water structure owners/operators are contacted to arrange interviews, the interview team will also discuss its interest in arranging follow-up visits to observe and document the location of their property's structure(s) using a small vessel on the LDW. These waterway users will be provided with a brief description of the in-water structures assessment and associated field reconnaissance needs. It will be made clear that this work will not involve a detailed survey of the condition of their structures. Follow-up will be performed during the in-person interviews to further coordinate the in-water structures assessment, including scheduling.

All observations will be made from a safe working distance and the crew will avoid interrupting facility operations, unless otherwise arranged with the facility owner/operator. It is therefore anticipated that in-water work will be completed without the need for formal access agreements.

2.4.2 Methods and Equipment

The in-water work will be conducted using a small-craft vessel operated by Moffatt & Nichol. A three-person crew will participate in the field assessment of each in-water structure. Observations will be made from a safe working distance, and the crew will avoid interrupting facility operations unless otherwise necessary to obtain basic survey information, in which case access will be prearranged with the facility owner/operator.

In addition to the small-craft vessel, field equipment for the in-water structures assessment will include cameras, measuring tape, handheld GPS unit, laptop computer and/or tablet, cellular phones, and appropriate water safety and boating gear.

The field team will coordinate in advance with individual facility operators, taking note of site operations that could conflict with the field investigations and/or pose potential assessment hazards or constraints. In addition to the general notification process described in Section 2.4.1, the field team will notify and coordinate with the facility operator at least 48 hours prior to the site assessment. The in-water work will also document the location of structures (e.g., dolphins and pile fields) that are not associated with a particular facility, in which case coordination with the operator is not required. To the extent feasible, in-water field investigations will be conducted in a sequential fashion (progressing either upstream or downstream along one shoreline of the LDW) to maximize efficiency and reduce unnecessary crossings of the navigation channel. A follow-up trip may be made, if needed, to capture information

associated with any structures that are not accessible during the initial visit (e.g., due to tides or vessels).

The field team will complete an in-water structures assessment form (Attachment 3) for each designated in-water structure. The form consists of five sections to be completed by the assessment team:

- **General facility information**—Provide information such as structure type(s), river mile and side, owner/operator, assessment date and time, and assessment personnel. Dolphins and pile fields that are not associated with a particular facility will be identified accordingly in this section.
- **Structural description and access restrictions**—Describe the structure's construction type, general condition, location, and potential construction or sampling access constraints (such as approximate under-pier clearance). Visually assess general bank slope, steepness, slope condition (e.g., riprap or soft sediment accumulation), amount of debris, evidence of scour/erosion, etc.
- **Structure vicinity map**—Use the provided aerial photograph of the structure vicinity to identify locations of GPS readings and photos, potential access constraints, and other relevant facility data.
- **Photo log**—Include photographs taken during the in-water assessment process, where permitted by the property owner, including shots of accessible structure faces (north, south, east, and west), upstream and downstream views of the channel, typical shoreline conditions, and potential access constraints for future remedial design sampling and construction. For each log entry, include the photo element, photo number, direction from or toward which the photo is taken, and brief photo description/comments.
- **Facility Sketch**—Provide an optional sketch of the structure and/or specific elements, if needed, to document features such as pile spacing, location of bracing, approximate under-pier clearance, etc.

The field team will also record horizontal coordinates of the accessible corners of in-water structures using a handheld GPS unit with an accuracy of ±0.5 ft. This will include capturing individual locations, or corners, of existing dolphins or pile fields that are not associated with a particular facility, as noted above. These coordinates will be input to GIS site maps to confirm/update the location of waterway structures.

The assessment of in-water structures will be conducted in accordance with Moffatt & Nichol's corporate health and safety procedures for marine vessel operations. A project health and safety plan (HSP) consisting of an emergency management plan and activity hazard analysis is provided as Attachment 4. The HSP includes general and site-specific safety considerations, personal protection and vessel safety equipment, physical hazards, hazard risk management

procedures, and training and certification requirements (e.g., boater education and first aid/cardiopulmonary resuscitation training).

2.5 REPORTING

Information and data generated from the survey and assessment will be compiled in GIS. The compiled information will be summarized in a report in accordance with the requirements of Task 8 of the AOC amendment SOW. The report will provide a summary of the data collection activities and associated information obtained, including:

- Summary of the in-person waterway user surveys, including parties contacted and interview questions and responses (any PII or CBI that may be collected from participants will be excluded from the project report)
- Summary of the owner, type, and footprint of in-water structures
- An updated map and GIS layers of in-waterway structures
- Tabular summary of detailed structural features by river mile
- An updated map of waterway uses, including relevant vessel maneuvering, berthing, anchoring, and other potential bottom-disturbing activities
- Tabular summary of potential future development and/or uses and timing of such plans.

Supplemental information that may be provided by survey participants may include as-builts, dredge permits, vessel drawings, facility diagrams, etc. The list of this information will be provided in the report, and the information itself will be retained in the project files for future use during remedial design.

The survey and assessment data will provide the basis for performing Task 9 of the AOC amendment SOW: the recovery category recommendations report. A description of Task 9 is provided in the pre-design studies work plan submitted in accordance with Task 1 of the third amendment SOW (Windward et al. 2017).

3 SCHEDULE AND DELIVERABLES

The following schedule is consistent with the AOC amendment. The survey and assessment will begin following approval of this work plan; it will be initiated in 2017 and completed in 2018.

Milestone	Planned Dates [a]	Scheduling Note [b]
Milestone dates will be updated upon approval of this work plan.		
Contact and coordination with waterway users	4/19/2017 to 12/10/2017	Initiate upon EPA approval of work plan
In-person interviews	5/20/2017 to 12/10/2017	**Initiate within 30 days of EPA approval of work plan**
Perform interview follow-up to gather additional data (as needed)	5/20/2017 to 12/31/2017	
Assessment of in-water structures	1/1/2018 to 2/14/2018	
Submittal of the draft Task 8, waterway user survey and assessment of in-water structures report, for EPA review	3/31/2018	**45 days from completion of user interviews and structural survey/assessment**
EPA and stakeholder review of draft Task 8 report on the survey and assessment	4/1/2018 to 4/30/2018	Assumed 30 days
Comment resolution and completion of draft final Task 8 report on the survey and assessment	5/1/2018 to 5/30/2018	30 days from receipt of EPA comments
Task 8 waterway user survey and assessment of in-water structures report finalization and submittal	5/31/2018 to 6/29/2018	

Notes:

[a] All dates are preliminary and subject to change.

[b] **Bold** scheduling notes indicate schedule constraints stipulated by the AOC amendment.

4 REFERENCES

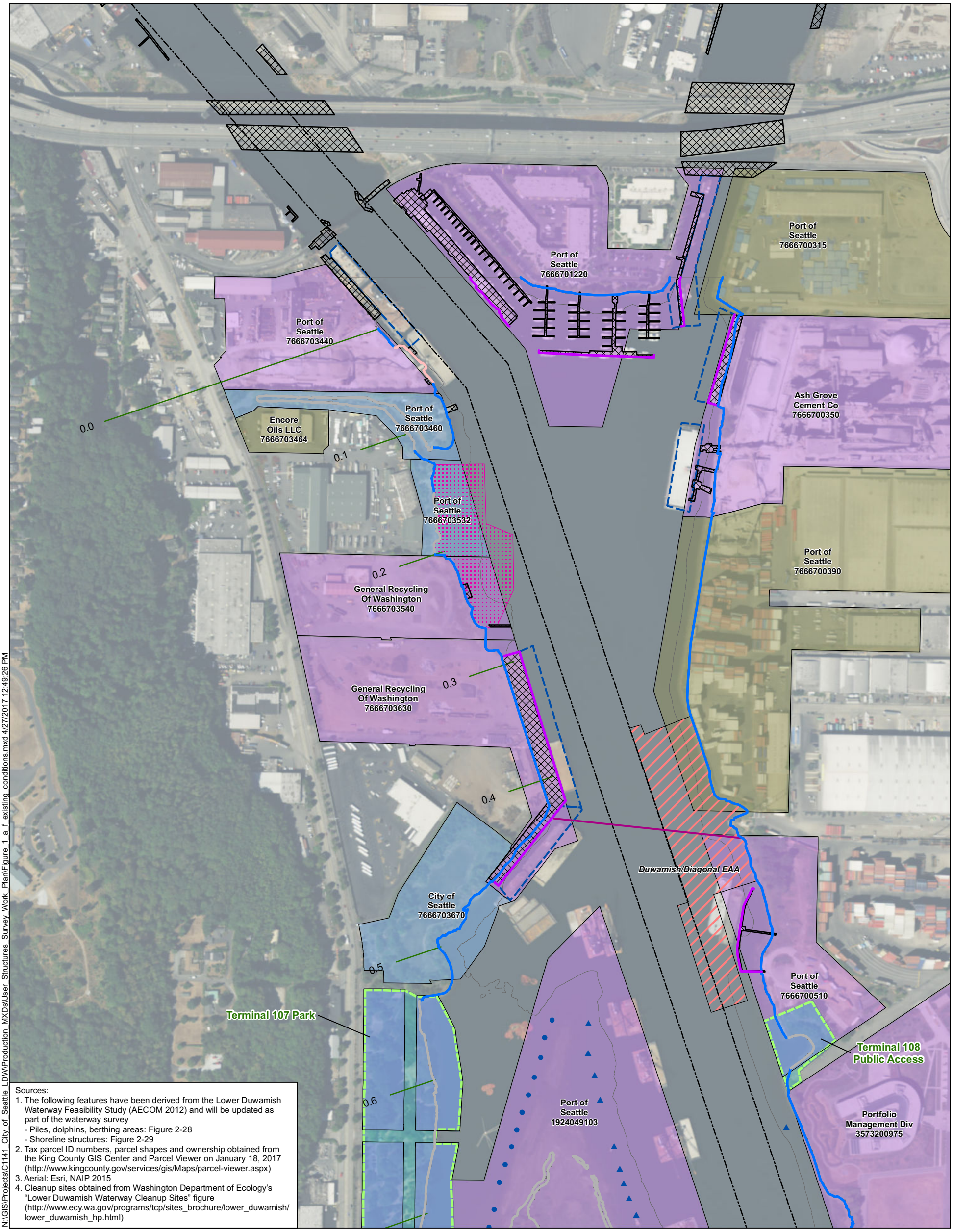
AECOM. 2012. Final feasibility study, Lower Duwamish Waterway, Seattle, Washington. Submitted to U.S. Environmental Protection Agency Region 10 and Washington State Department of Ecology. AECOM, Seattle, WA.

EPA. 2014. Record of decision, Lower Duwamish Waterway, Seattle, Washington. U.S. Environmental Protection Agency Region 10, Seattle, WA.

EPA. 2016. Third amendment to administrative order on consent, Lower Duwamish Waterway, Seattle, Washington. U.S. Environmental Protection Agency Region 10, Seattle, WA.

Windward et al. 2017. (In prep.) Pre-design studies work plan. Windward Environmental LLC, Seattle, WA; TerraStat Consulting Group, Seattle, WA; and Integral Consulting Inc., Seattle, WA.

FIGURES



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Sources:
1. The following features have been derived from the Lower Duwamish Waterway Feasibility Study (AECOM 2012) and will be updated as part of the waterway survey
   - Piles, dolphins, berthing areas: Figure 2-28
   - Shoreline structures: Figure 2-29
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Assumed Property Use (Preliminary Designation)
- Waterway-Dependent Users
- Recreational Use Businesses/Associations
- Residential and Waterfront Properties without Water-Dependent Facilities
- Tribal Users
- Washington Department of Ecology Site
- Federal Cleanup Site

- Overwater Structure
- Underwater Utility
- Navigation Channel
- River Mile Marker

Shoreline Structure
- Armored Slope
- Vertical Bulkhead
- Exposed Bank
- Dock Face

- Pile
- Dolphin
- Pile Group
- Berthing Area

0 200 400 Feet

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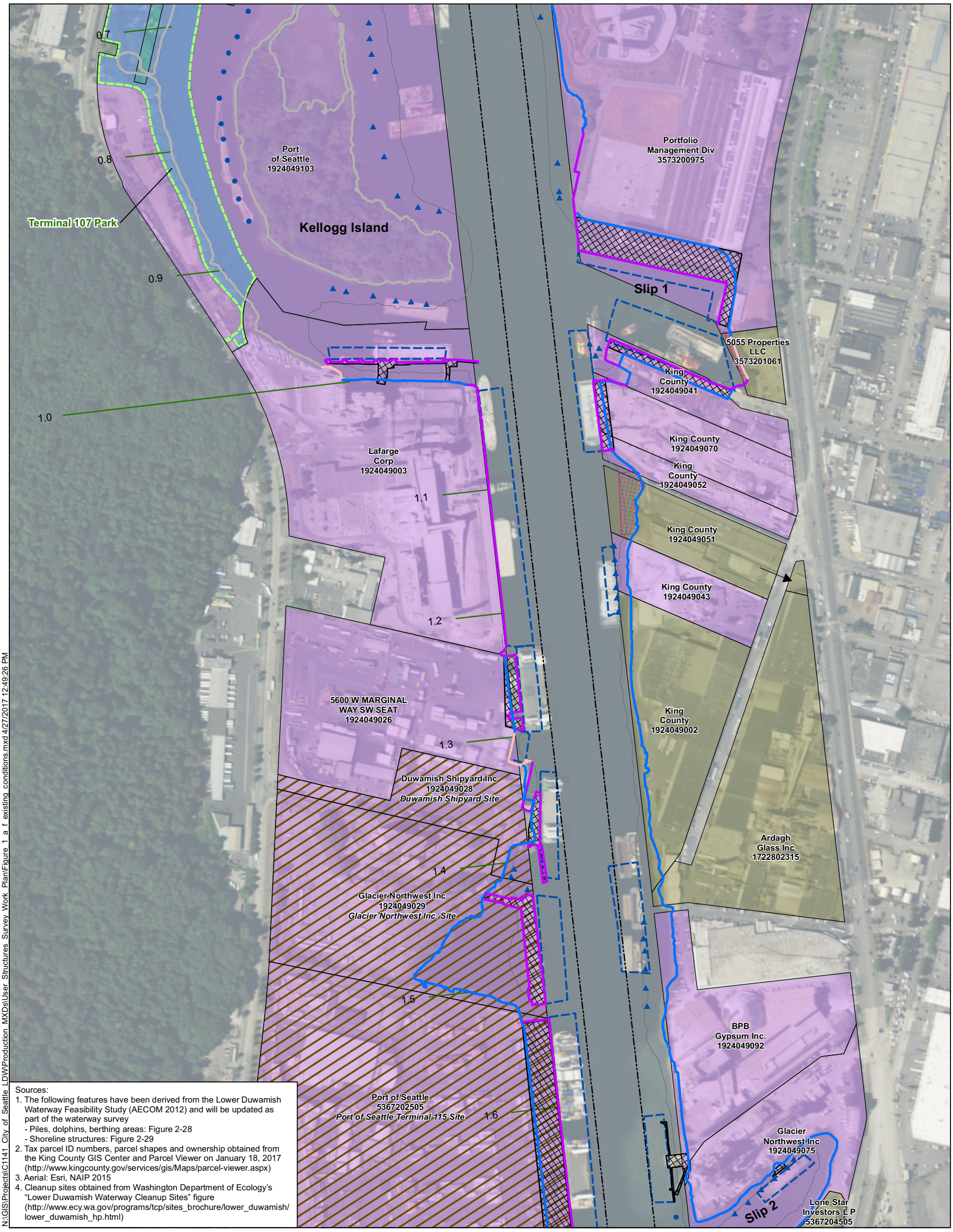
Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

Figure 1a.
Preliminary Identification of Structures, Berthing Areas, and Property Ownership



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- Dock Face

- Pile
- Dolphin
- Pile Group
- Berthing Area

0 200 400 Feet

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Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

Figure 1b.
Preliminary Identification of Structures, Berthing Areas, and Property Ownership

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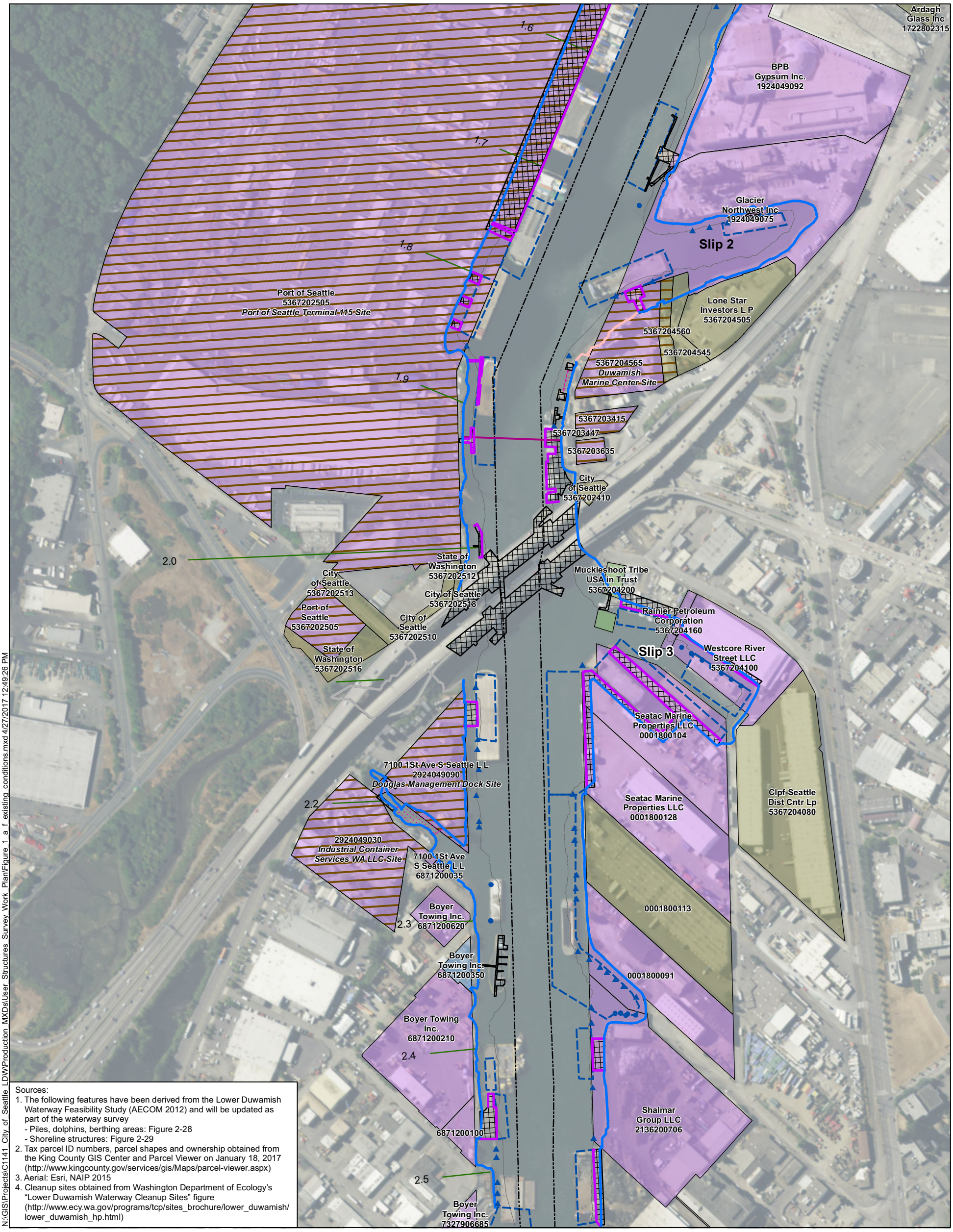

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- Dock Face

- Pile
- Dolphin
- Pile Group
- Berthing Area

0 200 400 Feet

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Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

Figure 1c.
Preliminary Identification of Structures, Berthing Areas, and Property Ownership

6871200100
Shalmar Group LLC 2136200706
2.5
Boyer Towing Inc. 7327906685
Cascade Barge & Equipment 7327906645
Brackish Properties LLC 7327906755
2.6
7327905770
7327905760
Six Fourteen South Logistic 7327905750
Six Twenty South Logistics 7327905725
City of Seattle 7327905700
2.7
Hurlen Logistics LLC 7327905350
Cleanscapes Inc 2136200681
Cleanscapes Inc 2136200670
City of Seattle 2136200666
DeNovo Seattle LLC 2136200641
Crowley Marine Services 8th Ave S Site
City of Seattle 2924049110
Slip 4 EAA
Slip 4
Cassell Point LLC 7327904100
2.8
King County 7327904049
First South Properties LLC 2924049043
Silver Bay Logging Inc 7327903645
2.9
Silver Bay Logging Inc 7327902520
Wamm LLC 7327902395
Boeing 0022000005
Boeing Plant 2 EAA
3.0
King County 7327901195
City of Seattle 7327902355
7327901215
3.1
3224049003
3224049004
City of Seattle 3224049037
2185000520
2185000505
2185000495
2185000475
3.2
Boeing 2185000005
Boeing Plant 2 EAA
2185000815
Hmh LLC 2185000695
2185000685
3.3
King County 2185000895
Boeing 3324049002
Boeing Plant 2 EAA
South Park Marina Ltd Part 2185600070
3.4
South Park Marina Ltd Part 2185600025
Boeing 0001600020
Boeing Plant 2 EAA
South Park Marina Ltd Part 0001600001
South Park Marina Site

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- Dock Face

- Pile
- Dolphin
- Pile Group
- Berthing Area

0 200 400
Feet

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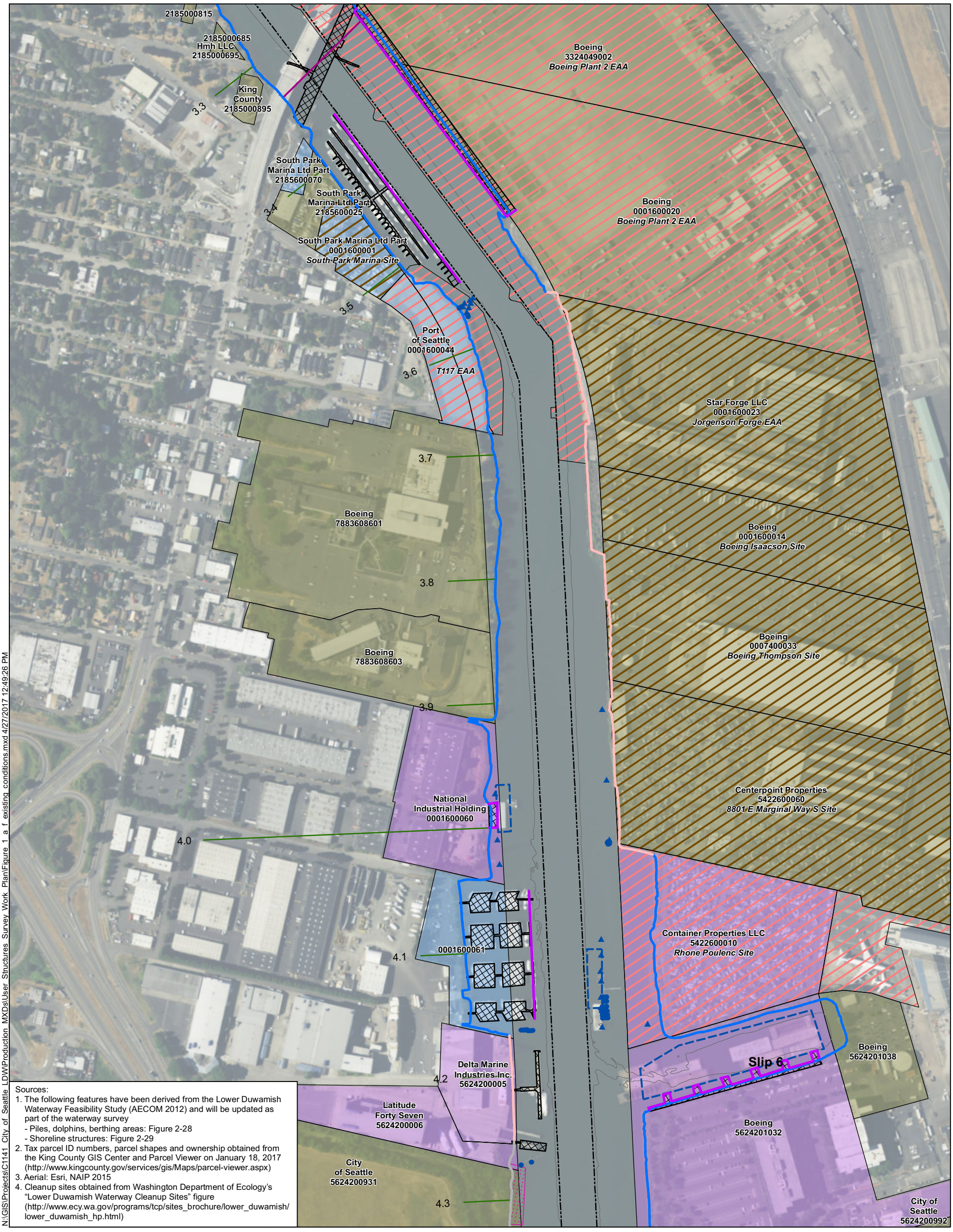
Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

Figure 1d.
Preliminary Identification of Structures, Berthing Areas, and Property Ownership



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- Dolphin
- Pile Group
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0 200 400 Feet

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Lower Duwamish Waterway Group
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Figure 1e.
Preliminary Identification of Structures, Berthing Areas, and Property Ownership

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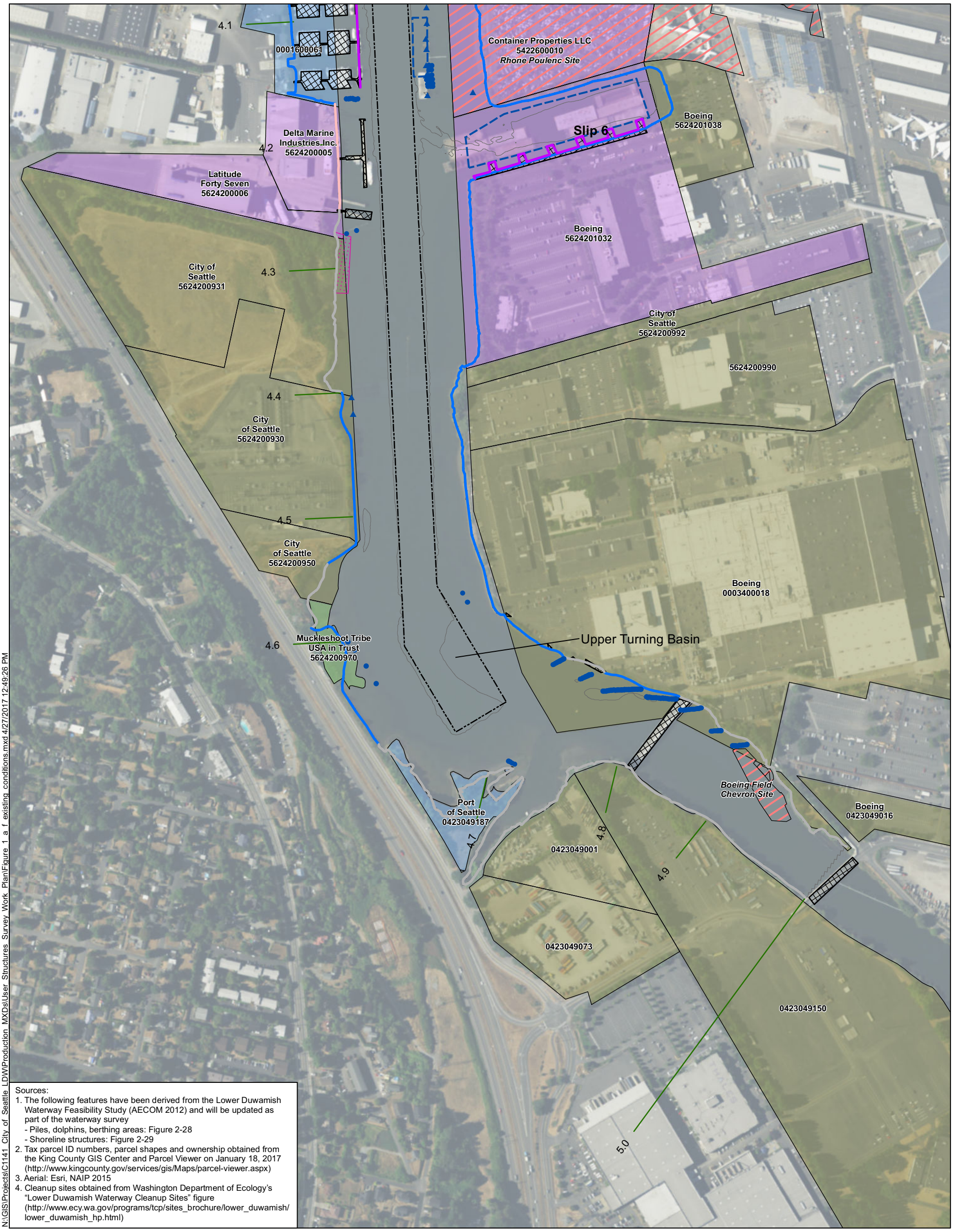

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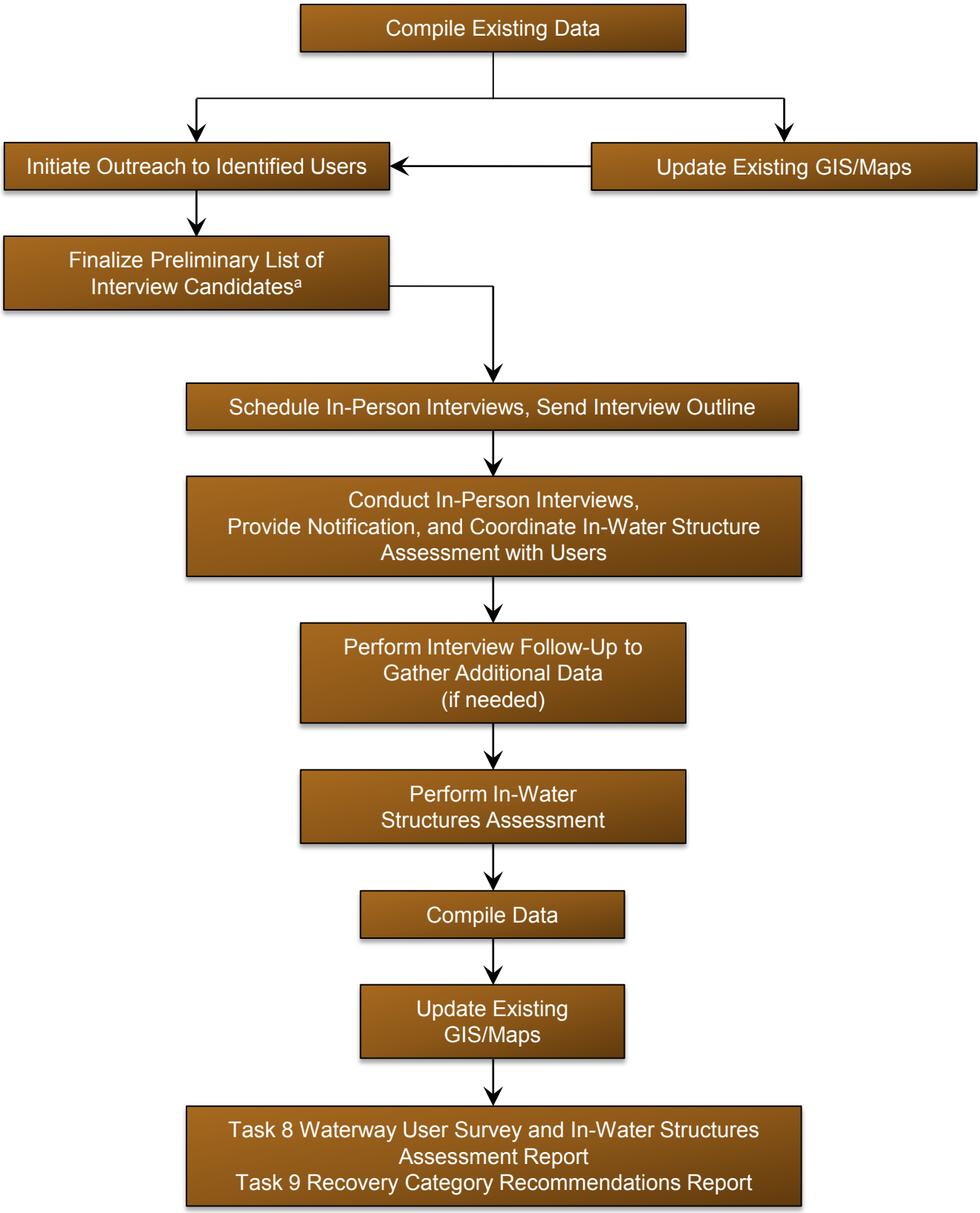
Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

Figure 1f.
Preliminary Identification of Structures, Berthing Areas, and Property Ownership



Notes: [a] The actual number of users interviewed is subject to change based on the outcome of outreach and information learned from the interview process. A complete list of users interviewed will be provided in the summary report.

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Lower Duwamish Waterway Group

Port of Seattle / City of Seattle / King County / The Boeing Company

Figure 2.
Waterway User and In-Water Structure Assessment Approach

ATTACHMENT 1

PRELIMINARY LIST OF WATERWAY USERS

Attachment 1. Preliminary List of Waterway Users

Tax Parcel ID#	Approx. River Mile	Owner	Tenant
Waterway-Dependent Users			
LDW Waterfront Properties			
2924049090	2.15 W	7100 1St Ave S Seattle L L	Alaska Marine Lines[a]
6871200035	2.25 W	7100 1St Ave S Seattle L L	Alaska Marine Lines[a]
1924049026	1.3 W	5600 W MARGINAL WAY SW SEAT	Alaska Marine Lines/Northland Services
7666700350	0.2 E	Ash Grove Cement Co	Ash Grove Cement/Stoneway Concrete
5624201032	4.3 E	Boeing	Boeing Developmental Center
6871200620	2.3 W	Boyer Towing Inc.	Boyer Towing Inc.
6871200210	2.4 W	Boyer Towing Inc.	Boyer Alaska Barge Line
7327906685	2.55 W	Boyer Towing Inc.	Alki Construction Co.
7327906755	2.6 W	Brackish Properties LLC	Pacific Pile And Marine Machine Shop
7327906645	2.55 W	Cascade Barge & Equipment	Pacific Pile and Marine
1924049092	1.55 E	BPB Gypsum Inc.	Certain Teed Corporation
5422600010	4.1 E	Container Properties LLC	Container Properties LLC [b]
5624200005	4.2 W	Delta Marine Industries Inc.	Delta Marine Industries Inc.
1924049028	1.35 W	Duwamish Shipyard Inc.	Duwamish Shipyard Inc. [a]
2924049043	2.9 E	First South Properties LLC	Cedar Grove Composting, Inc.
7666703540	0.25 W	General Recycling Of Washington	Birmingham Steel Scrap Yard
7666703630	0.25 W	General Recycling Of Washington	General Recycling Of Washington
5367204565	1.8 E	Individual Owner	Samson Tug and Barge [a]
5367203415	1.9 E	Individual Owner	Hale's Construction
5367203635	1.95 E	Individual Owner	Duwamish Marine Center/ Filter Engineering
1924049029	1.45 W	Glacier Northwest Inc.	Glacier Northwest Inc. [a]
1924049075	1.7 E	Glacier Northwest Inc.	Glacier Northwest Inc.
6871200100	2.45 W	Individual Owner	Boyer Towing
0001800091	2.3 E	Owned by Trust	Seattle Boiler Works
7327905350	2.75 W	Hurlen Logistics LLC	Hurlen Construction
1924049041	1.0 E	King County	Manson Construction
1924049070	1.05 E	King County	Lehigh Cadman/Manson
1924049052	1.1 E	King County	Lehigh Cadman
1924049043	1.15 E	King County	J.A. Jack And Sons
1924049003	1.1 W	Lafarge Corp	Lafarge Corp
5624200006	4.25 W	Latitude Forty Seven	Delta Marine Industries Inc.
7666701220	0 E	Port of Seattle	T-102 (Western Towboat Co./ Westar Marine Services/Taurus Marine Inc./Global Diving & Salvage/Arrow Launch Service/ Western Marine Construction, Inc.)

Attachment 1. Preliminary List of Waterway Users

Tax Parcel ID#	Approx. River Mile	Owner	Tenant
7666703440	0 W	Port of Seattle	T-103 (General Construction/ CalPortland)
1924049103	0.6–0.9 W	Port of Seattle	T-107 submerged lands/Kellogg Island mooring tenants: Alaska Marine Lines—moors south of Kellogg Island GC & Manson—moors east of Kellogg Island, T-107 southern area tenant (Trac Intermodal) [c]
7666700510	0.5–0.7 E	Port of Seattle	T-108W shoreline parcel/Diagonal Ave S Public Access (Salmon Bay Barge Line, Inc.) [c]
5367202505	1.5–2.0 W	Port of Seattle	T-115 (Alaska Marine Lines/Aloha Marine Lines/Lineage Logistics (SeaFreeze)/Northwest Seafood Processors) [a,c]
3573200975	0.7 E	Portfolio Management Div	Federal Center South
5367204160	2.1 E	Rainier Petroleum Corporation	Rainier Petroleum Corporation
0001600060	3.95 W	National Industrial Holding	Sea King Industrial Park LLC
0001800104	2.1 E	Seatac Marine Properties LLC	Glacier Marine Services
0001800128	2.2 E	Seatac Marine Properties LLC	Delta
2136200706	2.4 E	Shalmar Group LLC	Seattle Iron & Metals
7327903645	2.9 W	Silver Bay Logging Inc.	Silver Bay Logging
7327905725	2.65 W	Six Twenty South Logistics	Pacific Pile And Marine
2924049030	2.25 W	Individual Owner	Industrial Container Services [a]
2136200641	2.8 E	DeNovo Seattle LLC	Waste Management
5367204100	2.1 E	Westcore River Street LLC	Westcore River Building
Offsite Vessel Operators			
NA	NA	Argosy Cruises	NA
NA	NA	Lady Kate, Inc.	NA
NA	NA	Light Ship, Inc.	NA
NA	NA	Brusco Tug & Barge	NA
NA	NA	Crowley Marine Services	NA
NA	NA	Foss Maritime Company	NA
NA	NA	Island Tug and Barge	NA
NA	NA	Manke Tug & Barge Company	NA
NA	NA	National Oceanic and Atmospheric Administration	NA
NA	NA	Pacific Towing Services, Ltd.	NA
NA	NA	U.S. Coast Guard	NA
Recreational Use Businesses/Associations			
6871200350	2.35 W	Boyer Towing Inc.	River View Marina
7666703670	0.45 W	City of Seattle	City of Seattle, Parks Dept. (Herrings House Park)

Attachment 1. Preliminary List of Waterway Users

Tax Parcel ID#	Approx. River Mile	Owner	Tenant
7327902355	3.05 W	City of Seattle	City of Seattle, Parks Dept. (Duwamish Waterway Park/Duwamish Rowing Club)
7327901195	3.0 W	King County	City of Seattle, Parks Dept. (Duwamish River Park)
0001600061	4.1 W	Owned by Trust	Duwamish Yacht Club
7666703460	0.1 W	Port of Seattle	T-105 (Park/Public Access)
7666703532	0.1 W	Port of Seattle	T-105 (Park/Public Access)
0001600044	3.5–3.7 W	Port of Seattle	T-117[b]
0423049187	2.85 W	Port of Seattle	Turning Basin #3 (Park/Public Access)
2185600070	3.5–3.7 W	South Park Marina Ltd Part	Ricks Master Marine
0001600001	3.45 W	South Park Marina Ltd Part	South Park Marina [a]
NA	2.85 W	Port of Seattle	Eighth Ave Public Access
NA	NA	Alki Kayak Tours	NA
Owners of Residential and Waterfront Properties without Water-Dependent Facilities			
3573201061	1.0 E	5055 Properties LLC	Sno Pac Products
1722802315	1.4 E	Ardagh Glass Inc.	Ardagh Glass Inc.
7883608601	3.7 W	Boeing	Boeing South Park
0001600020	3.5 E	Boeing	Boeing Plant 2 [b]
0001600014	3.75 E	Boeing	Boeing Isaacson [a]
0007400033	3.8 E	Boeing	Boeing Thompson Site [a]
3324049002	3.35 E	Boeing	Boeing Plant 2[b]
0022000005	3.0 E	Boeing	Boeing Plant 2 [b]
2185000005	3.2 E	Boeing	Boeing Plant 2[b]
7883608603	3.85 W	Boeing	Boeing Radiation Effects Lab
5624201038	4.3 E	Boeing	Boeing Developmental Center
0003400018	4.6 E	Boeing	Boeing Developmental Center
0423049016	4.95 E	Boeing	Boeing Vacant Land
7327904100	2.8 W	Cassell Point LLC	Cassell Point LLC
5422600060	4.0 E	Centerpoint Properties	Insurance Auto Auctions [a]
5367202410	2.0 E	City of Seattle	City of Seattle, Dept. of Transportation
5367202510	2.2 W	City of Seattle	City of Seattle, Dept. of Transportation
5367202513	2.2 W	City of Seattle	City of Seattle, Dept. of Transportation
5367202518	2.2 W	City of Seattle	City of Seattle, Dept. of Transportation
3224049037	3.15 W	City of Seattle	City of Seattle, Seattle Public Utilities
7327905700	2.7 W	City of Seattle	City of Seattle, Seattle Public Utilities
5624200931	4.3 W	City of Seattle	City of Seattle, Seattle City Light
5624200930	4.45 W	City of Seattle	City of Seattle, Seattle City Light

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2136200666	2.75 E	City of Seattle	City of Seattle, Seattle City Light (Georgetown Pump Station)
2924049110	2.8 E	City of Seattle	City of Seattle, Seattle Public Utilities (Slip 4) [b]
5624200992	4.4 E	City of Seattle	City of Seattle, Seattle City Light
5624200950	4.55 W	City of Seattle	City of Seattle
2136200681	2.65 E	Cleanscapes Inc.	Cleanscapes Inc.
2136200670	2.7 E	Cleanscapes Inc.	Puget Sound Truck Lines
5367204080	2.2 E	Clpf-Seattle Dist Cntr Lp	Seattle Distribution Center
3224049004	3.15 W	Individual Owner	Individual Owner
5624200990	4.4 E	Owned by Trust	Boeing Development Center
0423049150	4.8 W	Owned by Trust	Boeing Employees Activity Center
7666703464	0.1 W	Encore Oils LLC	SeQuential Pacific Bio Diesel
5367204560	1.8 E	Individual Owner	Duwamish Marine Center
5367204545	1.8 E	Individual Owner	Vacant
5367203447	1.95 E	Individual Owner	Duwamish Marine Center
2185000495	3.2 W	Individual Owner	Individual Owner
0001800113	2.3 E	Individual Owner	Dawn Food Products
7327905760	2.65 W	Individual Owner	Individual Owner
7327901215	3.1 W	Individual Owner	United Site Services of Seattle WA
2185000695	3.25 W	Hmh LLC	Hmh LLC
3224049003	3.15 W	Individual Owner	Individual Owner
1924049002	1.3 E	King County	Ardagh Glass Inc.
2185000895	3.3 W	King County	King County Roads
7327904049	2.85 W	King County	King County Wastewater
1924049051	1.15 E	King County	United Western Supply/Ardagh Glass
5367204505	1.75 E	Lone Star Investors L P	Glacier Northwest/General BioDiesel
2185000475	3.2 W	Individual Owner	Individual Owner
0423049001	4.8 W	Owned by Trust	AIF Trailer Leasing
0423049073	4.8 W	Owned by Trust	Pamco Construction
2185000685	3.3 W	Individual Owner	Individual Owner
7666700390	0.3–0.4 E	Port of Seattle	T106: T-106 inland parcel (Seattle Tunnel Partners/Fisk/ US Customs and Border Protection), T-106 shoreline parcel (ConGlobal)
7666700315	0 E	Port of Seattle	T-104 (PCC logistics)
7327902520	2.9 W	Silver Bay Logging Inc.	Work Boats Northwest
7327905750	2.65 W	Six Fourteen South Logistic	SFR
2185000815	3.25 W	Individual Owner	Individual Owner
2185600025	3.4 W	South Park Marina Ltd Part	Tire Factory
0001600023	3.6 E	Star Forge LLC	Star Forge LLC [b]
5367202512	2.0 W	State of Washington	State of Washington

Attachment 1. Preliminary List of Waterway Users

Tax Parcel ID#	Approx. River Mile	Owner	Tenant
5367202516	2.0 W	State of Washington	State of Washington
2185000505	3.2 W	Individual Owner	Individual Owner
2185000520	3.17 W	Individual Owner	Individual Owner
7327905770	2.6 W	Individual Owner	Individual Owner
7327902395	3.0 W	Wamm LLC	Wamm LLC
Tribes			
5367204200	2.0 E	Muckleshoot Tribe USA in Trust	Muckleshoot Tribe USA in Trust
5624200970	4.6 W	Muckleshoot Tribe USA in Trust	Muckleshoot Tribe USA in Trust
NA	NA	Suquamish	NA

Notes:

All property ownership and tenant information presented in this table is preliminary and based on information gathered from the King County GIS Center and Parcel Viewer on January 18, 2017, and updated with readily available published data sources and best professional judgement. In some cases, the listed owner may be a third-party agent or property manager. This information will be verified as part of the waterway user survey and is thus subject to change.

Only tax parcel ID number is listed for properties owned by a private party/trust.

The categories of waterway users presented in this table and the associated methods by which they will be contacted are outlined in Section 2.3.1 of the *Waterway User Survey and Assessment of In-Water Structures Work Plan*.

Listed vessel operators were identified based on a preliminary review of automatic identification system (AIS) data which reports the identity, position and speed of commercial vessel traffic. The vessel operators selected represent greater than 90 percent of the overall commercial traffic and more than 98 percent of the overall tug traffic on the Lower Duwamish Waterway.

NA = not applicable; indicates an identified waterway user that is located offsite

[a] Washington Department of Ecology Model Toxics Control Act (MTCA) Site, Lower Duwamish Waterway Cleanup Sites (http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/lower_duwamish_hp.html)

[b] Federal Cleanup Site, includes Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) Cleanup Sites, Lower Duwamish Waterway Cleanup Sites (http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/lower_duwamish_hp.html)

[c] Tax parcel provides both water-dependent use and recreational uses associated with a park or public access.

ATTACHMENT 2

DISCUSSION TOPICS FOR THE LOWER DUWAMISH WATERWAY USER SURVEY

DISCUSSION TOPICS FOR THE LOWER DUWAMISH WATERWAY USER SURVEY

Lower Duwamish Waterway Group (LDWG) is conducting a survey under the direction of the U.S. Environmental Protection Agency (EPA) to better understand certain uses of the Lower Duwamish Waterway (LDW). As part of the survey process, waterway users with apparent water-dependent uses will be asked to participate in interviews to discuss their current and potential future waterway activities. Interviews will also be arranged with representatives from the Muckleshoot and Suquamish Tribes; however, these interviews will follow a separate process, in coordination with EPA.

Background information regarding the survey is provided below, followed by a list of topics and questions that may be discussed during in-person interviews, depending on the nature of the individual participant's waterway uses.

This document was developed as an attachment to the final *Waterway User Survey and Assessment of In-Water Structures* work plan, which includes additional background information. The full work plan can be found on the LDWG website (www.LDWG.org).

Who Is LDWG?

LDWG is a partnership of King County, the City of Seattle, the Port of Seattle, and the Boeing Company that is actively working with EPA, the Washington State Department of Ecology, the Tribes, and LDW stakeholders to advance the implementation of EPA's planned cleanup of LDW sediments.

Why Are We Performing This Work?

We are conducting a waterway user survey to develop a better understanding of vessel operations and waterway activities that may be relevant to the design and implementation of the LDW sediment cleanup. In addition to this survey of waterway operations, we will gather information on the type and location of in-water structures.

We are performing this work under the direction of EPA, which is coordinating with the Muckleshoot and Suquamish Tribes, Washington State Department of Ecology, and LDW stakeholders. EPA's record of decision for the cleanup can be found at https://yosemite.epa.gov/r10/cleanup.nsf/sites/lduwamish.

The survey of waterway users and collection of information regarding in-water structures will help make sure the cleanup is implemented in a manner that is compatible with the

many industrial, commercial, private, Tribal,[1] and recreational activities that are reliant on the waterway. We are contacting waterway users to assist us with this effort in order to gather details vital to accommodating those who may be affected by construction activities.

Who Will We Interview?

As part of the survey process, we will ask users of the LDW with apparent waterway-dependent uses to participate in voluntary in-person interviews to discuss current and potential future waterway activities.

Waterway-dependent users include waterfront property owners and tenants with water-dependent uses that are supported by shoreline infrastructure (e.g., docks, piers, wharves, berthing areas). An example is an industrial facility that has a shoreline pier and associated berthing areas.

Waterway-dependent users also include operators of large vessels and barges that frequently utilize the waterway, including commercial tug, barge, and cargo vessel operators, as well as federal agencies (i.e., National Oceanic and Atmospheric Administration and U.S. Army Corps of Engineers) that may or may not have permanent waterfront facilities.

In addition to waterway-dependent users, we will also interview agency representatives for state and federal cleanup sites.

What Topics Will Be Discussed during the Interviews?

To help prepare for in-person interviews, we are sharing in advance the following list of discussion topics and questions to provide a general understanding of the information we are seeking. Note: we are not seeking responses to these questions in advance of the interview.

The interview team will ask questions from this list, as applicable, during the in-person interviews and will note user responses on a separate form. People who choose to participate are welcome to bring any materials or information that could be helpful in answering these questions. The maps attached to the end of this form are intended to aid discussions and will be used as a template by the interview team to record observations and notes.

Not all topics and questions listed below will apply to everyone. The interview team will focus discussions on subject matter that is applicable for a given interview. In responding to questions, we encourage sharing information that is representative of recent past and

[1] EPA will be responsible for coordinating with Tribal fisheries representatives and following policies and procedures that address federal trust responsibilities.

anticipated future waterway-dependent activities (±5 years). Additional details or information that may not be readily available during the interview can also be provided through coordinated follow-up with the interview team, and the results of the interview will be available for review prior to submittal of the report to EPA to ensure that the information is correct and appropriate.

For facilities with waterfront structures, the interview team will be interested in arranging a brief follow-up visit to observe and document the location, construction, and general condition of the structures. This assessment would be conducted so as to avoid interrupting facility operations.

How Will Information be Handled?

We encourage withholding any potentially confidential business information (CBI) from the interview. Any such information provided will be kept strictly confidential in the project file and will be excluded from future reports. Aside from individual contact names, personally identifiable information (PII), such as home phone number, home address, and personal e-mail address will not be collected unless required for communication purposes. In the event this contact information is provided, it will also remain strictly confidential in the project files and will not be disclosed in reports or other work products.

The information we collect as part of this survey (excluding any PII or CBI) will be summarized in a survey and assessment report and shared with the federal and state agencies responsible for conducting the cleanup. The finalized report will be made available to the public via the LDWG website (www.LDWG.org). The report is anticipated be finalized in 2018. All survey participants will receive notification once this report is available.

How Can Additional Information Be Requested?

For additional questions regarding the planned LDW cleanup or the purpose of the waterway user survey, or to be added to EPA's factsheet mailing list or sign up for e-mail updates, please contact EPA's project manager:

Elly Hale, Remedial Project Manager, hale.elly@epa.gov, 206-553-1215

Thank you for your help in this survey effort.

NOTE: THE FOLLOWING IS A PREVIEW OF QUESTIONS THAT MAY BE ASKED BY THE INTERVIEW TEAM TO PROMPT DISCUSSION DURING IN-PERSON INTERVIEWS. THERE IS NO NEED TO PROVIDE RESPONSES IN ADVANCE. THANK YOU FOR PARTICIPATING IN THIS EFFORT!

1. GENERAL USER INFORMATION

- Date
- Company name
- Business/organization type
- Business physical address
- Business mailing address
- Name(s) of contact(s) interviewed
- Business phone
- Business e-mail
- Name and contact information for the property owner (applies to waterfront facilities where owner is different than above)

2. DESCRIPTION OF WATERWAY-DEPENDENT USES

2a. Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

2b. Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

2c. Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

2d. Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

2e. Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

3. INFORMATION SPECIFIC TO OPERATION OF VESSELS

3a. Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

3b. Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

3c. Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

3d. Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

3e. If you are a tugboat operator, please describe the companies/facilities that you typically serve.

3f. If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

3g. For activities involving barges, when and where are spuds used (or are moorings used instead)?

3h. For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

4. FACILITY-SPECIFIC INFORMATION

4a. Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

4b. Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

5. FUTURE ACTIVITIES

5a. Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

5b. Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

6. FOLLOW-UP ACTIONS

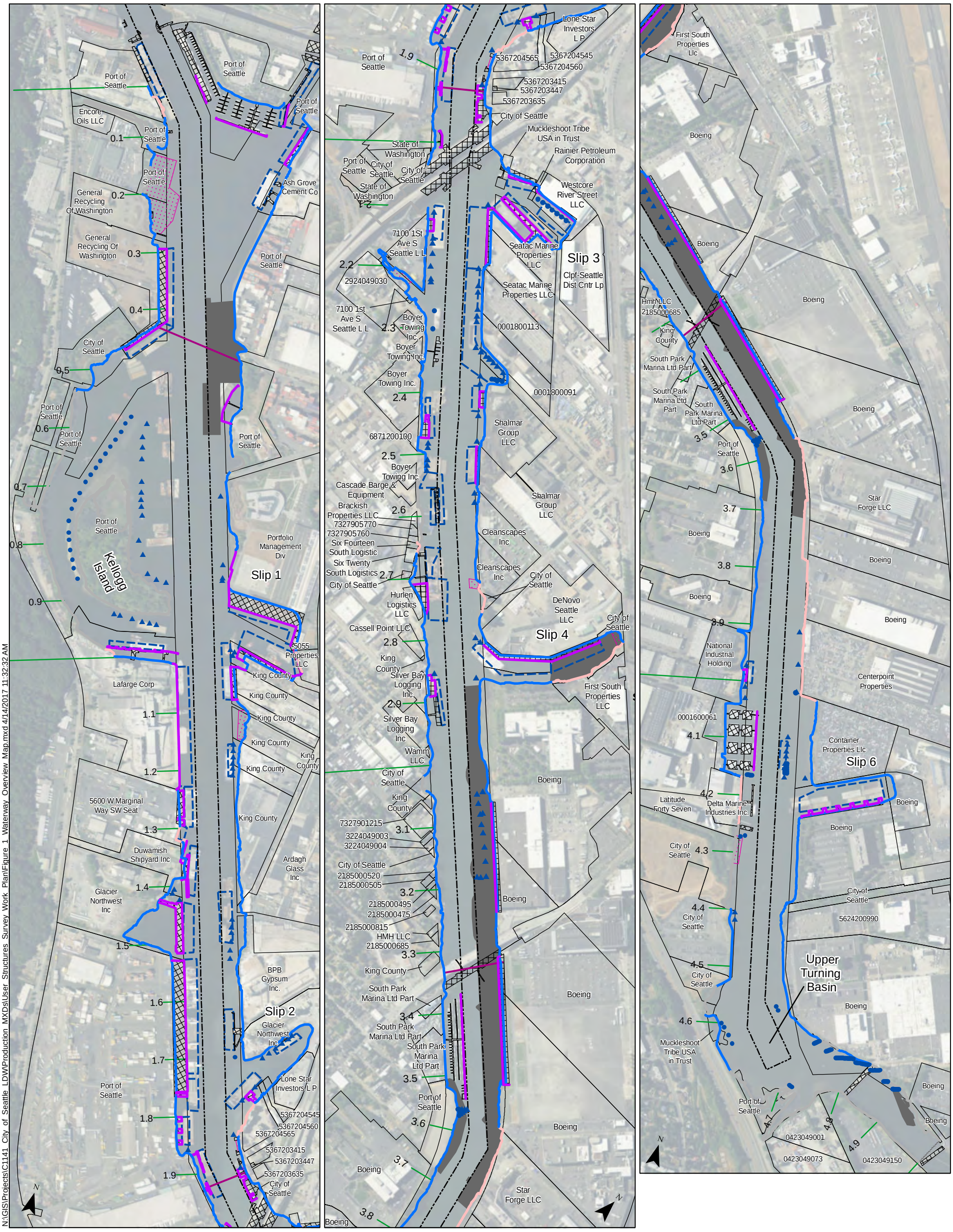
6a. Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

6b. For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

7. MAPS

Waterway overview and facility maps are provided on the following pages. These maps are provided as reference materials to facilitate discussion and for the interview team's use to sketch and mark features noted during the interview.

Thank you very much for your time.



N:\GIS\Projects\C1141 City of Seattle LDWProduction MXDs\User Structures Survey Work Plan\Figure 1 Waterway Overview Map.mxd 4/14/2017 11:32:32 AM

Notes:
1. The waterway features, adjacent property ownership, and assumed property use information presented in this figure is preliminary, based on readily available published data sources and best professional judgment. This information will be verified as part of the waterway user survey and is thus subject to change.
2. Only tax parcel ID numbers are shown at locations where a property is owned by a private party/trust.

Sources:
1. The following features have been derived from the Lower Duwamish Waterway Feasibility Study (AECOM 2012) and will be updated as part of the waterway survey
   - Piles, dolphins, berthing areas: Figure 2-28
   - Shoreline structures: Figure 2-29
2. Tax parcel ID numbers, parcel shapes and ownership obtained from the King County GIS Center and Parcel Viewer on January 18, 2017 (http://www.kingcounty.gov/services/gis/Maps/parcel-viewer.aspx)
3. Aerial: Esri, NAIP 2015

Early Action Area (29 acres)
Overwater Structure
Underwater Utility
Navigation Channel
River Mile Marker

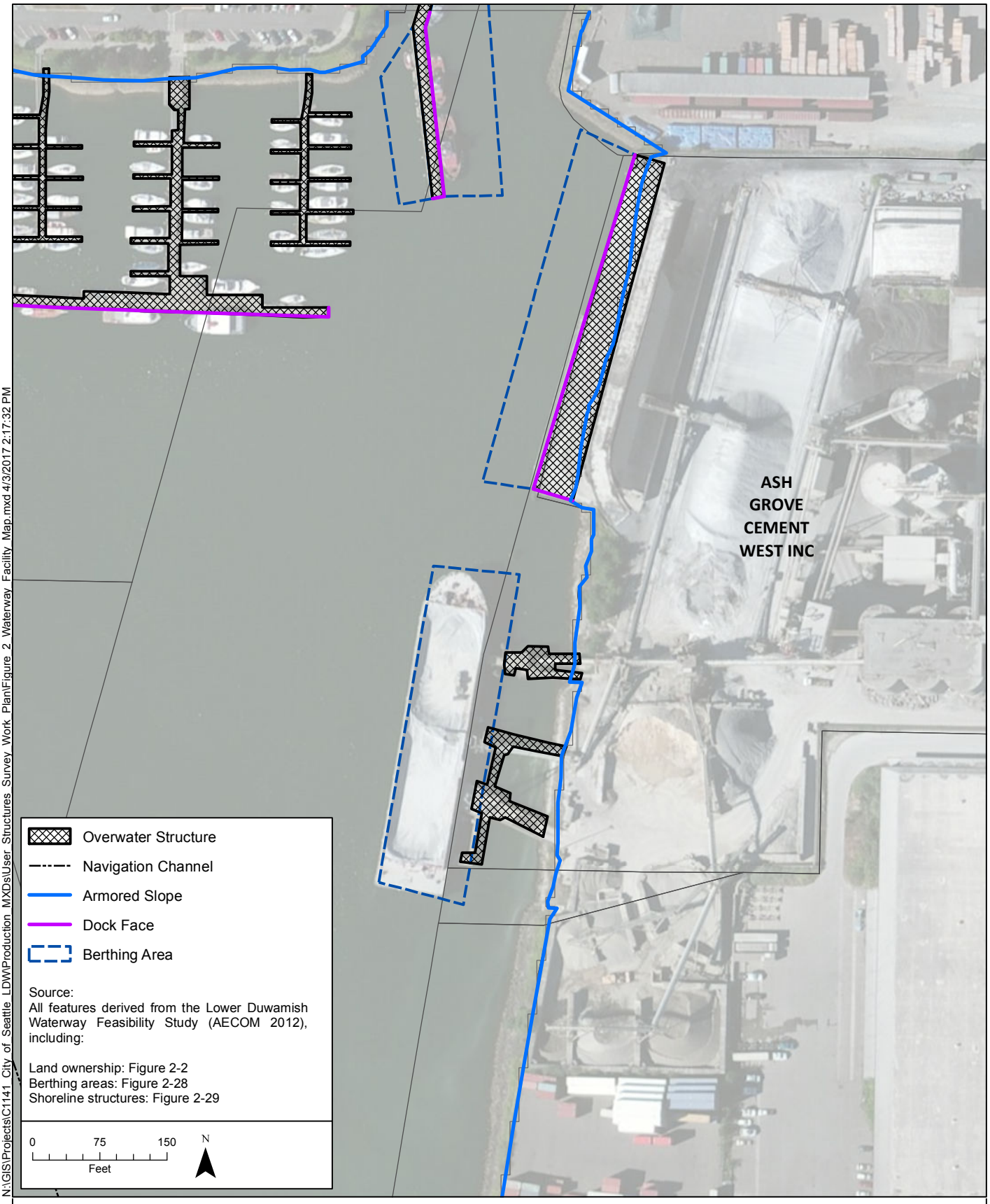
Shoreline Structure
Armored Slope
Vertical Bulkhead
Exposed Bank
Dock Face
Pile
Dolphin
Pile Group
Berthing Area

0 500 1,000
Feet

integral consulting inc.

Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

Figure 1.
Preliminary Identification of Structures, Berthing Areas, and Property Ownership



integral consulting inc.

Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

Figure 2.
Waterway Facility Map Example

ATTACHMENT 3

IN-WATER STRUCTURES ASSESSMENT FORM

Lower Duwamish Waterway In-water Structure Survey

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure:_____

_____

River Mile _____Side:_____

Structure Type(s)/Use(s):

_____

_____

_____

_____

Structure was Identified during 2012 Feasibility Study (Y/N): _____

Facility Owner:_____

Business Phone #:_____

Facility Operator:_____

Name of Contact:_____

Business Phone #:_____

Assessment Date/Time:_____

Team Leader:_____

Assessment Personnel:_____

_____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls)**:**

_____

_____

_____

_____

_____

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

_____

_____

_____

_____

Prepared By:

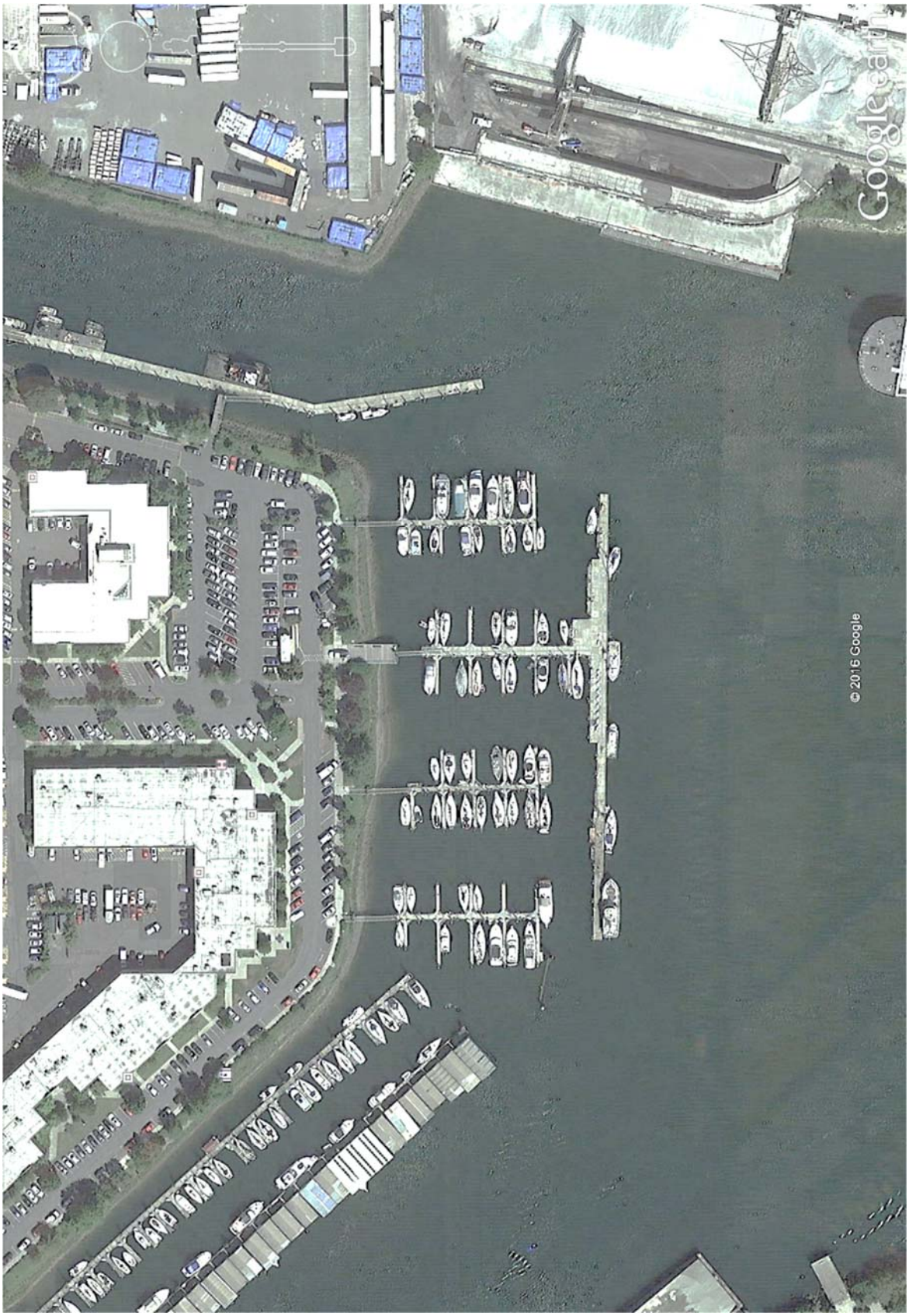
moffatt & nichol
600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS:	DATE:

Structure: _____

Assessment Date: _____

3. STRUCTURE VICINITY MAP:



Structure: _____
Assessment Date: _____

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments

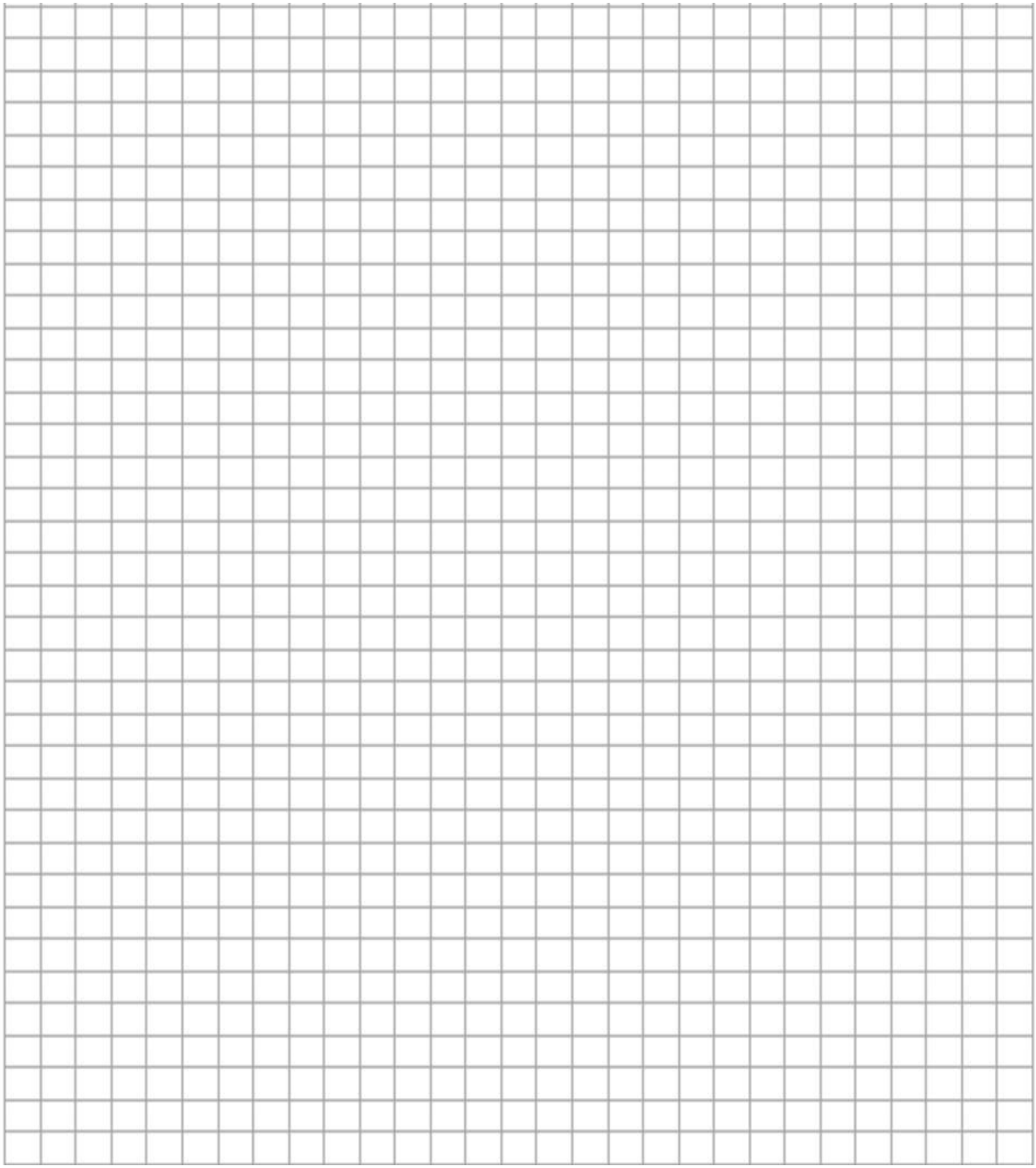
Photos Required:

- ☐ All Structure Faces (N, S, E, W)
- ☐ Significant Defects/Deterioration
- ☐ Timber Debris (if visible)
- ☐ Upstream/Downstream Views of Channel
- ☐ Typical Shoreline Conditions
- ☐ Access Limitations

Structure: _____

Assessment Date: _____

5. FACILITY SKETCH (OPTIONAL)



ATTACHMENT 4

PROJECT HEALTH AND SAFETY PLAN

– ACTIVITY HAZARD ANALYSIS

– EMERGENCY MANAGEMENT PLAN

Activity Hazard Analysis (AHA)

Activity/Work Task: Assessment of In-Water Structures	Overall Risk Assessment Code (RAC) (Use highest code)	**M**
Project Location: Lower Duwamish Waterway, Seattle, WA	**Risk Assessment Code (RAC) Matrix**	
Contract Number: 16-008-S	**Severity** / **Probability**	
Date Prepared: February 2, 2017		
Prepared by (Name/Title): Colleen Fischer / Task Coordinator		
Reviewed by (Name/Title): Aaron Patterson / In-Water Assessment Team Leader		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	**E**	**E**	**H**	**H**	**M**
Critical	**E**	**H**	**H**	**M**	**L**
Marginal	**H**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

Tasks associated with the in-water structures field assessment include:

- Boating Operations – Visual inspection of in-water structures and access restrictions including field notes/sketches and photographs; hand-held GPS readings of in-water structure locations taken from vessel.
- Above deck – Above deck access to structures is not part of the in-water structures assessment. General safety procedures pertaining to above deck work are included in this AHA as field personnel may access waterway user facilities as part of the user survey process. Field staff will adhere to any specific safety procedures and PPE requirements of the site owners/operators when accessing their facilities.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

E = Extremely High Risk

H = High Risk

M = Moderate Risk

L = Low Risk

Job Steps	Hazards	Controls	RAC
1.1 General Site Safety	Preparation	A first aid medical kit shall be kept and ready for use at the work site. A minimum of two crew members shall be trained in First Aid and CPR emergency procedures.	**N/A**
1.2	Contact with surfaces and equipment	Minimum Personal Protective Equipment (PPE): hardhat, safety toe shoes, safety glasses, personal flotation device (PFD), and work gloves as required for the type of work being performed.	**L**
1.3	Exposure to Cold/Hot Weather	Wear appropriate clothing for cold or hot weather. Maintain hydration by taking water breaks as necessary.	**M**
1.4	Heat Stroke	The team leader and every crew member will monitor the health condition of each other during topside operations.	**L**
1.5	Good Housekeeping	Site housekeeping shall be maintained and inspected daily. Trash accumulated from the assessment crew such as paper products will be collected and disposed of at the end of each working day.	**L**

Job Steps	Hazards	Controls	RAC
1.6	Heat Stress/Dehydration	Cooler with cold water and refreshments to be present at job site.	**M**
1.7	Tripping	Good housekeeping. Site shall be maintained and inspected daily. Trash accumulated from the inspection crew such as paper products will be collected and disposed of at the end of each working day. Equipment not in use will be stowed away.	**L**
1.8	Eye Injury/Sun Damage	All crew members must wear UV rated safety glasses when working under extreme sunlight conditions. PPE equipment and spare UV rated safety glasses are provided by M&N for all employees and visitors. All eye protection will bear the "Z87" logo indicating compliance.	**L**
1.9	Pinch Points	Personnel will keep arms and hands inside of vessel while approaching structures. During inspection personnel will be cognizant of potential pinch points and not put themselves between the vessel and other objects.	**L**
1.10	Unsound Structures	Personnel to wear hard hats during inspection of structures to protect from potential falling debris. Inspection vessel will not be tied off to structures that appear unsecure.	**L**
2. Set Up (Mobilization)	Sprains, strains, flying objects, slips, trips, falls, eye injuries, lacerations, puncture wounds	Hard hat, safety glasses, work boots, ear plugs, PFDs, good housekeeping procedures.	**L**
3.1 Topside Inspection	Falling off wharf or out of vessel	Personnel to wear PFDs when conducting topside inspections. Assessment crew vessel will be equipped with a life ring for assisting with rescue if personnel fall into the water.	**L**
3.2	Hand Tools	Tools may include hammers, scrapers, and measuring tapes. All tools will be used in a manner consistent with their intended purpose. Gloves and protective eyewear will be used if sounding concrete with a hammer, or removing marine growth in the tidal zone.	**L**
4. Surveying	Falling out of vessel and collision with in-water structures	Notify vessel operator before taking survey readings to confirm conditions are safe to do so. Don't take readings in rough water or in vicinity of vessels creating significant wake. Maintain firm footing in vessel when taking survey measurements. Wear Personal Floatation Device and PPEs to protect from collisions with structures.	**M**
5. Boating Operations			**-**
5.1 Trailering boat to site	Boat sliding-off truck Items for boat flying out of truck	Secure boat to truck with load rated straps, 2 minimum. Secure all items in the back of truck.	**M**

Job Steps	Hazards	Controls	RAC
5.2 Loading and Unloading Equipment	Loading and unloading from the back of the truck	Use proper lifting techniques to avoid back injuries; know how to properly carry load; watch out for tripping and overhead obstacles.	M
5.3 Launching	Slipping on boat ramp	Use caution when stepping on boat ramp, conditions can be extremely slippery.	M
5.4 Starting	Falling out of boat. Prop hitting objects below boat	Make sure all inspection personnel are in a stable position, and maintain balance during boating operations. Make sure sufficient depth of water.	L
5.5 Operations	Boat taking on water	Make sure plugs are in and bailer is available. Watch for backwash over transom when slowing down and backing up. Make sure boat is not overloaded or loaded improperly so it will not list to one side and take water over the gunnel. Avoid rough water by operating in suitable conditions.	M
5.6	Obstacles	Make sure boat is directed in a safe direction while in operation.	L
5.7	Boat colliding with dock or other vessels	Stay out of shallow waters as much as possible and be observant for floating debris. Watch for other vessels on busy waterway. Avoid crossing navigation channel when not required to minimize conflicts with other vessels.	M
5.8	Lightning and storms	Operators should always keep watch for inclement weather and cease operations in inclement weather.	L
5.9	Engine breakdown	Make sure oars are available in the event of an engine failure. Thorough maintenance of engine will help prevent breakdowns in field. Boat is equipped with VHF radio for hailing USCG if needed.	L
5.10 Gas Tank Refill	Spilling Fuel	Boat fuel tank level will be kept at appropriate levels for the day's work. Gas cans used for refueling will include spill prevention auto-locking and closing mechanism.	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Appropriate PPE	Daily safety meetings will be conducted with specific subjects pertaining to the site along with definable features of work discussion.	Inspection of all gear and equipment shall be conducted daily and at the beginning of each shift.
Standard emergency equipment (First Aid kit)	Minimum 2 personnel on site are First Aid and CPR certified.	Daily

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Inspection Boat (27-ft aluminum) Boat safety equipment will include: boat hook, fire extinguisher, VHF radio, life jackets, and a life ring with 90-ft of 3/8" poly line.	In-water assessment team vessel operator(s) to complete training on the use and operation of the inspection boat and have Washington State Boater Education Cards.	Inspection of boat and motor will be conducted daily before beginning operations. Boat and motor will be properly secured at the end of operations. Insure safety equipment is on board including fire extinguishers and PFDs.
Company Vehicles	Company vehicles will be operated by personnel with valid M&N Drivers Qualification file which includes DOT Physical.	Company vehicle will be checked daily before operation for oil, gas, tires, mirrors, etc.

EMERGENCY MANAGEMENT PLAN

Moffatt & Nichol
600 University Street, Suite 610
Seattle, Washington 98101

TEAM LEADERS: Byron Haley, Aaron Patterson	DATE PREPARED: February 2, 2017
PROJECT NAME: Lower Duwamish Waterway Pre-Design Studies	
WATERWAY NAME: Lower Duwamish Waterway, Seattle, WA	
ASSESSMENT OF IN-WATER STRUCTURES OBJECTIVES: Perform visual inspection of in-water structures and access constraints including photographs, field notes/sketches, and hand-held GPS readings of in-water structure locations. Field activities will be performed from a small-craft vessel.	

EMERGENCY NOTIFICATION

US COAST GUARD DISTRICT 13: (206) 220-7001 ; VHF-FM Radio – Ch 16 (156.8 MHz)

EMERGENCY VICTIM TRANSPORT PLAN: Team Leader will CALL 911. Victim will be transported in the boat to the nearest emergency meeting location to meet EMS or transport by M&N vehicle.

NEAREST HOSPITAL & EMERGENCY SERVICES:

Harborview Medical Center
325 9th Avenue
Seattle, WA 98104

Call Emergency No. (24/7): (206) 744-3076
Medical Center Phone No.: (206) 744-3000

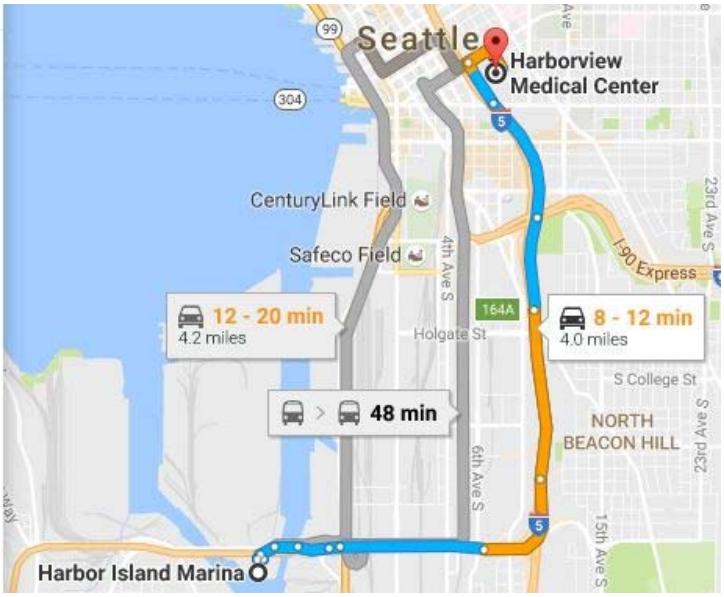
EMERGENCY MEETING LOCATIONS

Location #1: Harbor Island Marina (RM 0 East, South Float)
Driving directions from Harbor Island Marina (1001 Klickitat Way S.W., Seattle, WA 98134**)**

Harbor Island Marina
1001 Southwest Klickitat Way #101, Seattle, WA 98134

- Get on Spokane St Viaduct/West Seattle Bridge from SW Manning St and SW Spokane St Bridge
  1 min (0.4 mi)
- Drive along I-5 N. Take exit 164A from I-5 N
  5 min (3.3 mi)
- Continue on James St. Drive to 9th Ave
  2 min (0.2 mi)

Harborview Medical Center
325 9th Avenue, Seattle, WA 98104



Moffatt & Nichol
600 University Street, Suite 610
Seattle, Washington 98101

Location #2: First Ave S Bridge (RM 2 East, Boat Ramp south of bridge)
Driving directions from First Ave S Bridge (50 S River St, Seattle, WA 98108**)**

50 S River St
Seattle, WA 98108

- Get on I-5 N from E Marginal Way S and Corson Ave S
  5 min (1.7 mi)
- Take exit 164A from I-5 N
  5 min (3.8 mi)
- Continue on James St. Drive to 8th Ave
  3 min (0.3 mi)

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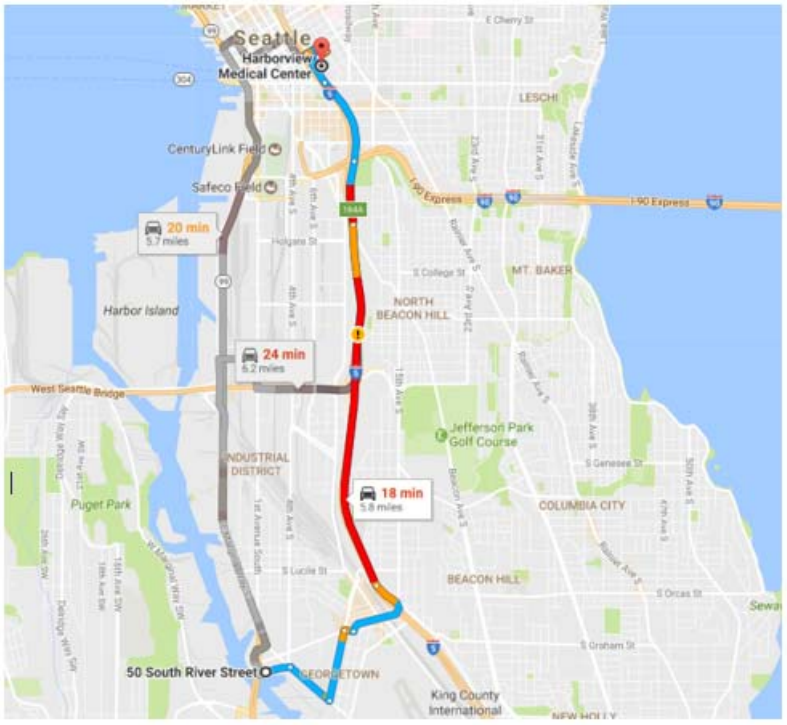

Location #3: Duwamish Waterway Park (RM 3 West, Boat Ramp south of bridge, north of floats)
Driving directions from Duwamish Waterway Park (7900 10th Ave S., Seattle, WA 98108**)**

Duwamish Waterway Park
7900 10th Ave S, Seattle, WA 98108

- Get on I-5 N from 16th Ave S, E Marginal Way S and Corson Ave S
  8 min (2.7 mi)
- Take exit 164A from I-5 N
  5 min (3.8 mi)
- Continue on James St. Drive to 9th Ave
  2 min (0.2 mi)

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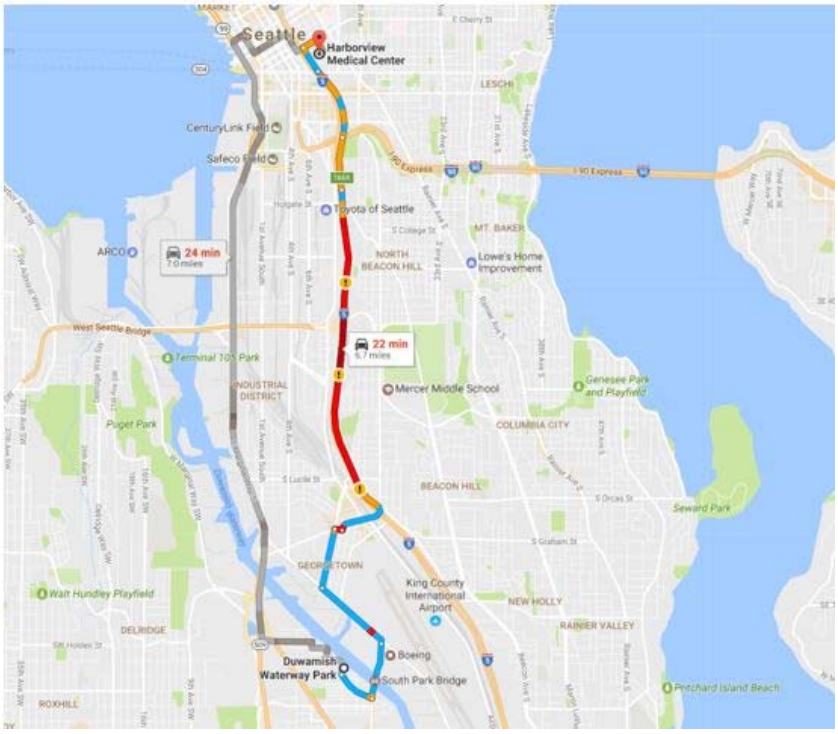

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Seattle, Washington 98101

RESCUE PROCEDURES:

CREW MEMBER OVERBOARD PROCEDURES:
Avoid panic, ascertain location of crew member, and assess any immediate hazards. Attempt to make verbal contact with crew member to determine if they are injured or need assistance to re-enter the vessel. The designated assessment Team Leader will be responsible for notification of emergency responders, and emergency transport as appropriate. Life ring will be deployed if necessary to assist in recovering crew member. If necessary, Team Leader will lift the crew member into the boat.

INJURED CREW MEMBER PROCEDURES:
The Team Leader will immediately terminate field operations, notify emergency responders if necessary, and arrange for emergency transport. The injured crew member will be transported to the nearest designated emergency meeting location (see above), and then transported to the emergency facility either by EMS or the M&N vehicle. If necessary first aid shall be performed, prior to emergency medical assistance arrival. If crew member is non-responsive, CPR will be performed by a trained crew member.