Appendix A: Correspondence

Northwest Archaeological Associates, Inc.
Cultural Resources Management Services
5418 20th Avenue NW, Suite 200, Seattle, WA 98107

July 9, 2007

Honorable Cecile Hansen
Duwamish Tribe
4717 West Marginal Way
Seattle, WA 98106

RE: SR 519 Intermodal Access Project - Phase 2
Cultural Resources Assessment

Dear Chairwoman Hanson,

Northwest Archaeological Associates, Inc. (NWAA) has been retained by the Washington State Department of Transportation (WSDOT), as designee for the Federal Highway Administration, to conduct a cultural resources assessment for the SR 519 Intermodal Access Project - Phase 2: Atlantic Corridor. The project is just south of downtown Seattle, east of SR 99, west of Interstate 5 (I-5), and adjacent to the football and baseball stadia, in Section 5, Township 24 North, Range 4 East, Willamette Meridian (Figure 1). Surface streets within the project include First Avenue South, Third Avenue South, Fourth Avenue South, South Royal Brougham Way, and South Atlantic Street. WSDOT has determined that the project is an undertaking and thus is subject to Section 106 of the National Historic Preservation Act, as amended.

The SR 519 project would connect the existing westbound off-ramp from I-5 and I-90 to the current South Atlantic Street overpass and construct improvements at the intersection of First Avenue South and South Atlantic Street to accommodate traffic along this new route. A grade-separated crossing over the railroad tracks at South Royal Brougham Way would also be built as would stormwater improvements.

NWAA is assessing the probability for archaeological resources by reviewing a wide variety of resources including past cultural resources studies and geotechnical bore log data, ethnographic and ethnohistoric resources, historical maps and photographs, and historical documents. Records at the Washington State Department of Archaeology and Historic Preservation show no previously recorded archaeological sites within the project, although there are a number of historical buildings.

At this time we are interested to know if the Tribe has any concerns for heritage resources in or near the project. If so, please contact us at your earliest convenience so these locations can be taken into account during planning. We look forward to hearing from you regarding this project. We respect any concerns the Tribe may have about sharing sensitive information with us, and we will be happy to work with you regarding
these concerns. This letter is a technical inquiry and is not intended to replace government-to-government consultation being conducted by WSDOT.

Please feel free to contact me or Chris Miss by telephone or email if you have questions or comments. Thank you for your attention to this matter.

Sincerely,

Lorelea Hudson
Sr. Archaeologist/Project Manager

Tel: (206) 781-1909
Fax: (206) 781-0154
Email: lhudson @northwestarch.com

Northwest Archaeological Associates, Inc.
Cultural Resources Management Services
5418 20th Avenue NW, Suite 200, Seattle, WA 98107

July 9, 2007

Laura Murphy
Muckleshoot Indian Tribe
39015 172nd Avenue SE
Auburn, WA 98092

RE: SR 519 Intermodal Access Project - Phase 2
Cultural Resources Assessment

Dear Ms. Murphy,

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5418 20th Avenue NW, Suite 200, Seattle, WA 98107

July 9, 2007

Andrea Rodgers
Snoqualmie Tribe
Post Office Box 969
Snoqualmie, WA 98065

RE: SR 519 Intermodal Access Project - Phase 2
Cultural Resources Assessment

Dear Ms. Rodgers,

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July 9, 2007

Dennis Lewarch
Suquamish Tribe
Post Office Box 498
Suquamish, WA 98292

RE: SR 519 Intermodal Access Project - Phase 2
Cultural Resources Assessment

Dear Mr. Lewarch,

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Cultural Resources Management Services
5418 20th Avenue NW, Suite 200, Seattle, WA 98107

July 9, 2007

Hank Gobin
Tulalip Indian Tribe
6410 23rd Avenue NE
Tulalip, WA 98271

RE: SR 519 Intermodal Access Project - Phase 2
Cultural Resources Assessment

Dear Mr. Gobin,

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July 9, 2007

Johnson Meninick
Yakama Nation
Post Office Box 151
Toppenish, WA 98948

RE: SR 519 Intermodal Access Project - Phase 2
Cultural Resources Assessment

Dear Mr. Meninick,

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Washington State Department of Transportation
Douglas B. MacDonald
Secretary of Transportation

Urban Corridors Office
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Seattle, WA 98104
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TTY: 1-800-833-6388
www.wsdot.wa.gov

April 5, 2007

Honorable Cecile Hansen
Duwamish Tribe
4717 West Marginal Way
Seattle, WA 98106

Re: SR 519 INTERMODAL ACCESS PROJECT

Dear Chair Hansen:

The Washington Department of Transportation (WSDOT), acting on behalf of the Federal Highway Administration (FHWA), is proposing an undertaking to address an identified transportation need in downtown Seattle, King County, Washington. The purpose the SR 519 Intermodal Access Project is to provide for increased mobility and safety by improving connections between I-5/I-90, the Port of Seattle, waterfront commercial interests (including State ferries), and recreational/sports facilities in the downtown area.

During Phase 1 of the project, WSDOT constructed new South Atlantic Street (Edgar Martinez Way) on-ramps to I-5 and I-90 and an overpass to separate road and rail traffic. The new connections increased safety and improved access to Port of Seattle, waterfront, and stadium areas for freight, ferry, and event traffic. This phase was open to traffic in spring 2004.

The purpose of Phase 2 of the project is to eliminate the remaining safety issues related to surface-level rail crossings at South Royal Brougham Way. As part of the environmental assessment (EA), WSDOT will evaluate the Atlantic Corridor option, which includes:

- Westbound off-ramp from I-5 to I-90 to the current South Atlantic Street overpass.
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- Grade-separated crossings for both vehicles and pedestrians at South Royal Brougham Way.

In order to ensure that we take into account the effects of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places, WSDOT is initiating formal Section 106 consultation with you as an additional consulting party pursuant to 36. CFR 800.2(c)(5). WSDOT has been delegated the authority from FHWA to initiate consultation, and we will be directly managing the cultural resources studies and carrying out this undertaking, you may contact us at any time for assistance with the process and/or the undertaking.

Your response to this letter, acknowledging your interest in participating in this undertaking as a consulting party, in identifying any Traditional Cultural Properties (TCPs) that may exist

within the project's Area of Potential Effects (APE), and any key contacts, is greatly appreciated. We are also inviting comments regarding any other concerns the proposed project may raise. Please provide a response by **May 7, 2007** so that we may discuss this undertaking and any of those identified areas of interest.

Enclosed please find a map of the project area with the highlighted areas of construction, and the purpose and scope of consultation.

Should you have any questions about this project, please contact me at 206-382-5279 or stenbek@wsdot.wa.gov. If you have any general questions about the Section 106 process, you may contact Ken Juell, UCO Cultural Resources Specialist, at 206-464-1236 or juellk@wsdot.wa.gov.

Sincerely,

Kate Stenberg
Project Environmental Manager

Enclosures

Cc: Steve Boch, FHWA
Kenneth Juell WSDOT
Matthew Sterner, DAHP

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July 3, 2007

Honorable Cecile Hansen
Duwamish Tribe
4717 West Marginal Way
Seattle, WA 98106

Re: SR 519 INTERMODAL ACCESS PROJECT, PHASE 2: ATLANTIC CORRIDOR

Dear Chair Hansen:

Per provisions of 36CFR800.2(c)(5), the Washington Department of Transportation (WSDOT), acting on behalf of the Federal Highway Administration (FHWA), is continuing consultation on the SR 519 Intermodal Access Project. Enclosed please find the project Area of Potential Effects (APE), which was determined by Cultural Resources Specialists Connie Walker Gray and Ken Juell per 36CFR800.4(a)(1) and includes the areas of proposed construction and one tax parcel adjacent to the work areas, the latter to consider any indirect project effects.

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Your timely response to this letter, commenting on our determination of the project's Area of Potential Effects (APE), is greatly appreciated. Please provide a response by August 5th, so that we may discuss your comments. Should you have any questions about this project, you may contact me at 206-382-5279 or stenbek@wsdot.wa.gov.

Sincerely,

Kate Stenberg
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Enclosures

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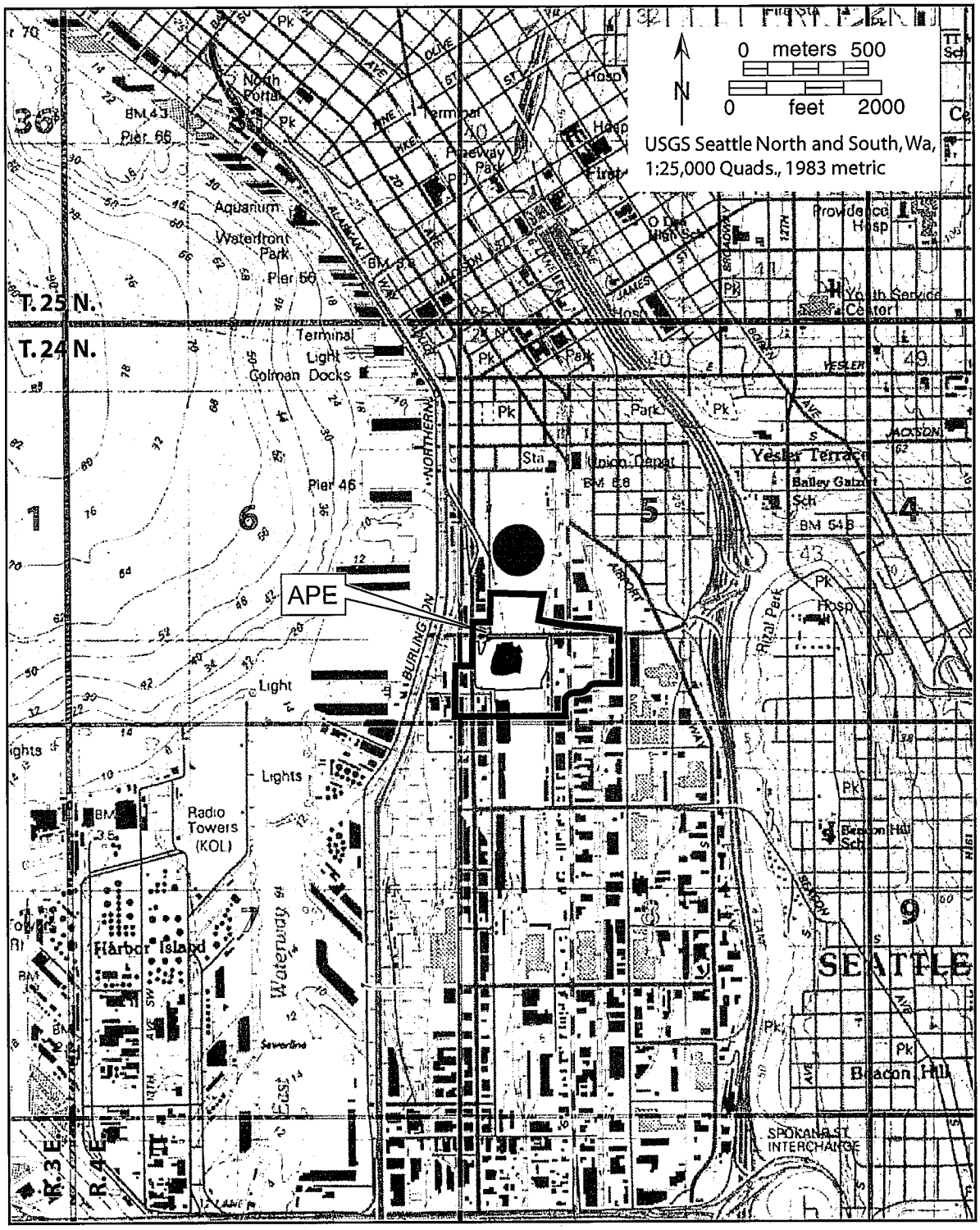

Figure 1. SR 519 area of potential effects (APE).

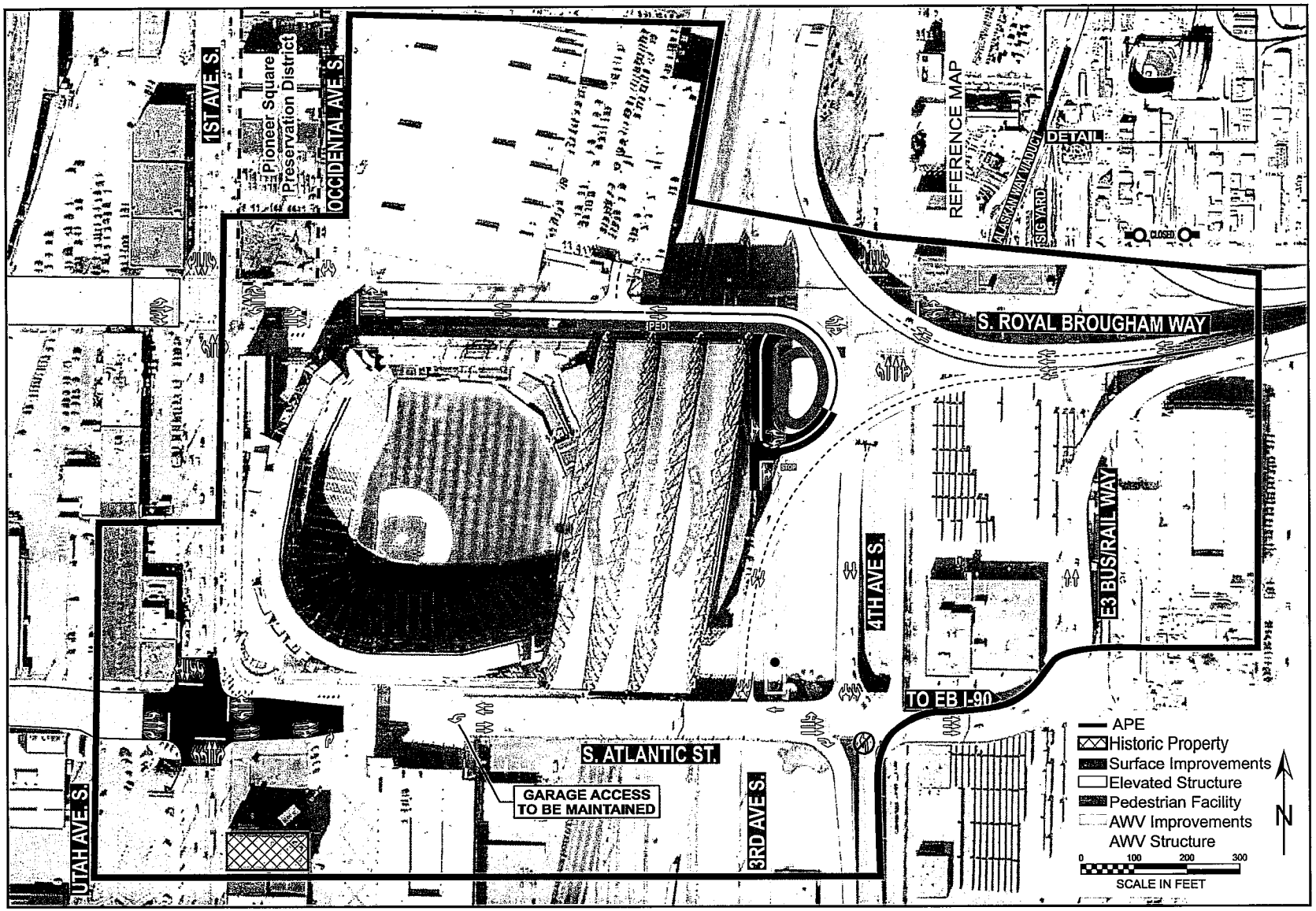

Figure 2. SR-519 APE.

Washington State Department of Transportation
Douglas B. MacDonald
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April 5, 2007

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Muckleshoot Indian Tribe
39015 172nd Ave SE,
Auburn, WA 98092

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In order to ensure that we take into account the effects of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places, WSDOT is initiating formal Section 106 consultation pursuant to 36. CFR 800.2(c)(4). Recognizing the government-to-government relationship it has with the Tribe, FHWA will continue to play a key role in this undertaking as the responsible Federal agency. However, since WSDOT has been delegated the authority from FHWA to initiate consultation, and we will be directly managing the cultural resources studies and carrying out this undertaking, you may contact us at any time for assistance with the process and/or the undertaking.

Your response to this letter, acknowledging your interest in participating in this undertaking as a consulting party, in identifying any Traditional Cultural Properties (TCPs) that may exist within the project's Area of Potential Effects (APE), and any key Tribal contacts, is greatly appreciated. We are also inviting comments regarding any other Tribal concerns the proposed project may raise. Please provide a response by **May 7, 2007** so that we may discuss this undertaking and any of those identified areas of interest.

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Enclosures

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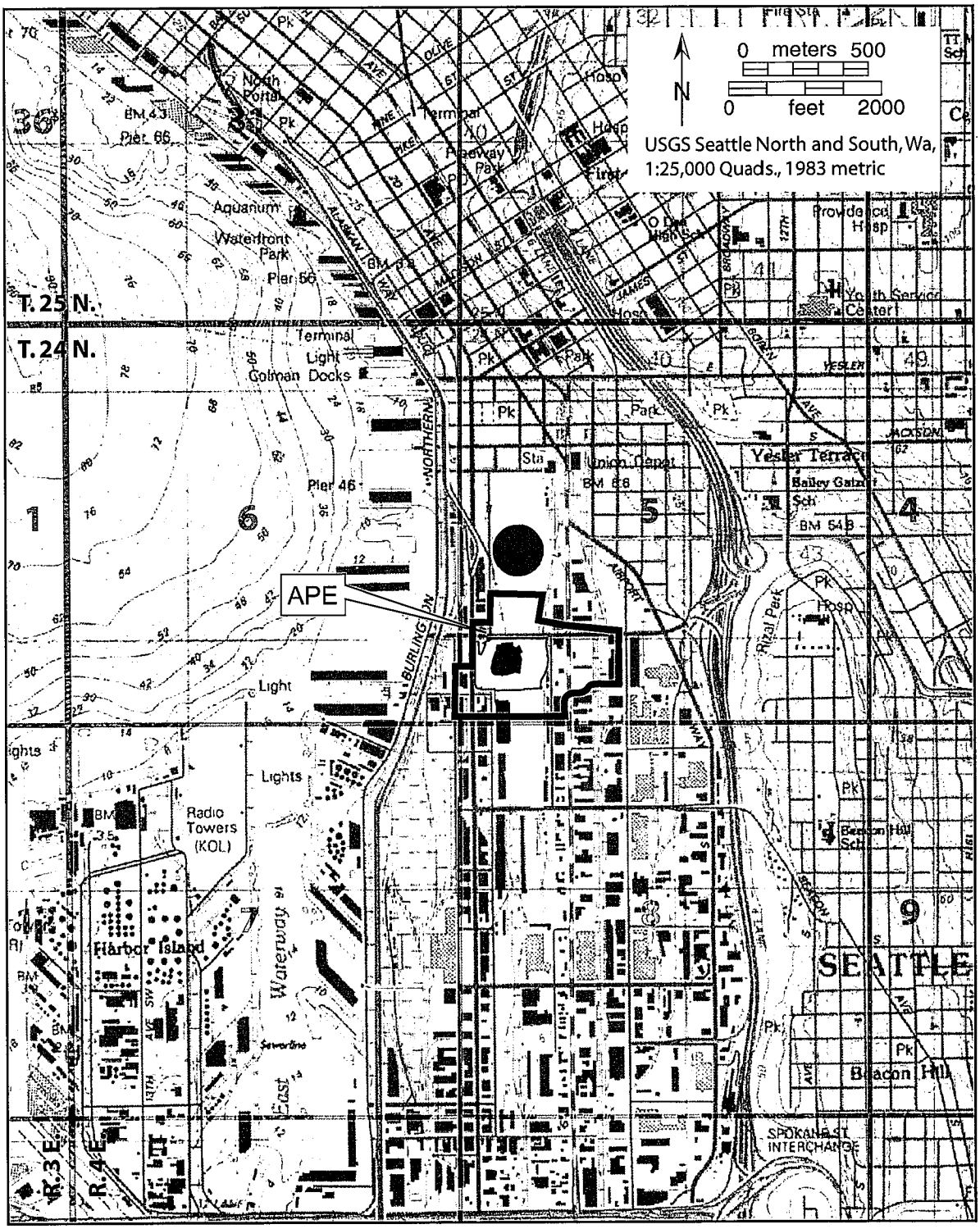

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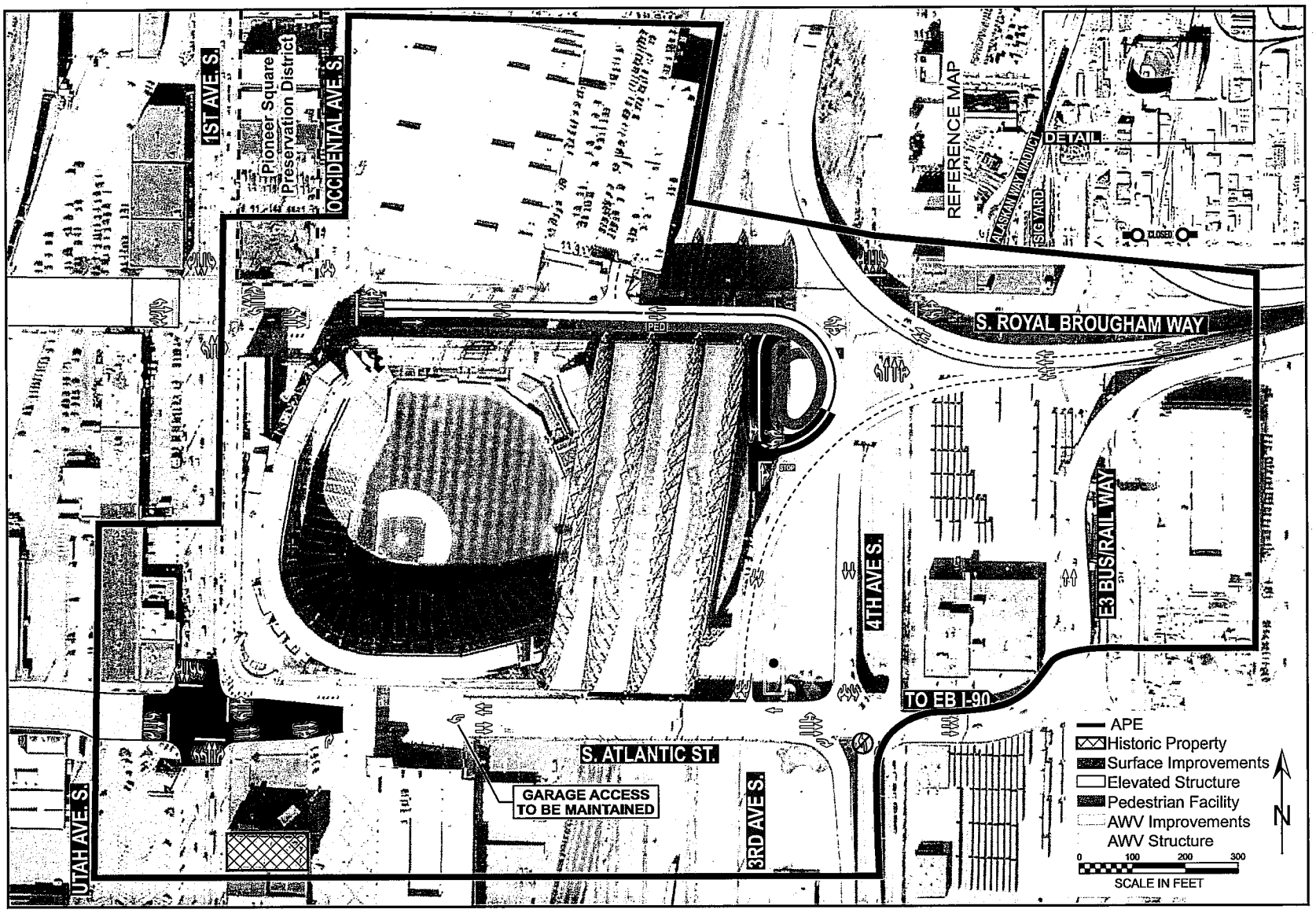

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Enclosed please find a map of the project area with the highlighted areas of construction, and the purpose and scope of consultation.

Should you have any questions about this project, please contact me at 206-382-5279 or stenbek@wsdot.wa.gov. If you have any general questions about the Section 106 process, you may contact Ken Juell, UCO Cultural Resources Specialist, at 206-464-1236 or juellk@wsdot.wa.gov.

Sincerely,

Kate Stenberg
Project Environmental Manager

Enclosures

Cc: Steve Boch, FHWA
Kenneth Juell WSDOT
Matthew Sterner, DAHP
Andrea Rodgers, Snoqualmie Tribe
Karen Suyama, Snoqualmie Tribe

SNOQUALMIE TRIBE

8130 Railroad Ave. Ste. 103
PO Box 969
Snoqualmie, WA 98065
Phone: 425-888-6551
Fax: 425-888-6727
E-Mail: Snoqualmie1855@snoqualmienation.com

April 24, 2007

Kate Stenberg
WSDOT Urban Corridors Office
Alaskan Way Viaduct & Seawall Project
999 Third Avenue, Suite 2424
Seattle, WA 98104

Re: SR 519 Intermodal Access Project

Dear Ms. Stenberg,

We would like to express our interest and desire to participate as a consulting party in the above-named project. Please address all future correspondence regarding this project to the following:

Andrea Rodgers, Transportation
Snoqualmie Indian Tribe
P.O. Box 969
Snoqualmie, WA 98065

In the interest of saving paper, there is no need to send more than one copy at this stage of the process. We will advise you if other Tribal staff members should receive particular materials at a later date. Thank you and we look forward to working with you as this project progresses.

Sincerely,

Andrea K. Rodgers

Washington State Department of Transportation
Douglas B. MacDonald
Secretary of Transportation

Northwest Region
Urban Corridors Office
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TTY: 1-800-833-6388
www.wsdot.wa.gov

July 3, 2007

Andrea Rodgers
Snoqualmie Tribe
P.O. Box 969
Snoqualmie, WA 98065

Re: SR 519 INTERMODAL ACCESS PROJECT, PHASE 2: ATLANTIC CORRIDOR

Dear Ms. Rodgers:

Per provisions of 36CFR800.2(c)(2), the Washington Department of Transportation (WSDOT), acting on behalf of the Federal Highway Administration (FHWA), is continuing consultation on the SR 519 Intermodal Access Project. Enclosed please find the project Area of Potential Effects (APE), which was determined by Cultural Resources Specialists Connie Walker Gray and Ken Juell per 36CFR800.4(a)(1) and includes the areas of proposed construction and one tax parcel adjacent to the work areas, the latter to consider any indirect project effects.

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Your timely response to this letter, commenting on our determination of the project's Area of Potential Effects (APE), is greatly appreciated. Please provide a response by August 5th, so that we may discuss your comments. Should you have any questions about this project, you may contact me at 206-382-5279 or stenbek@wsdot.wa.gov.

Sincerely,

Kate Stenberg
Project Environmental Manager

Enclosures

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Ken Juell, WSDOT
Don Seeberger, WSDOT
Sandie Turner, WSDOT
Matthew Sterner, DAHP

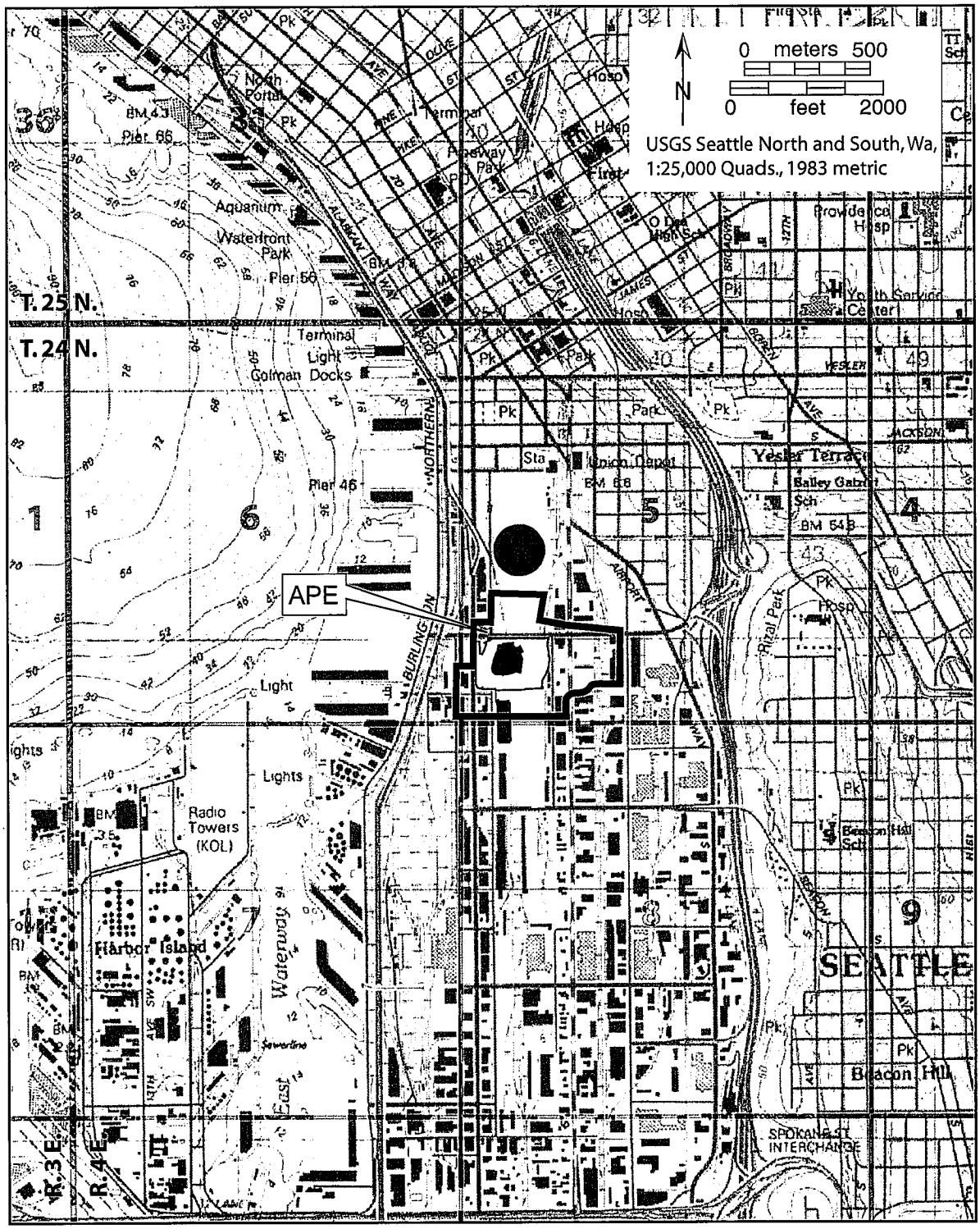
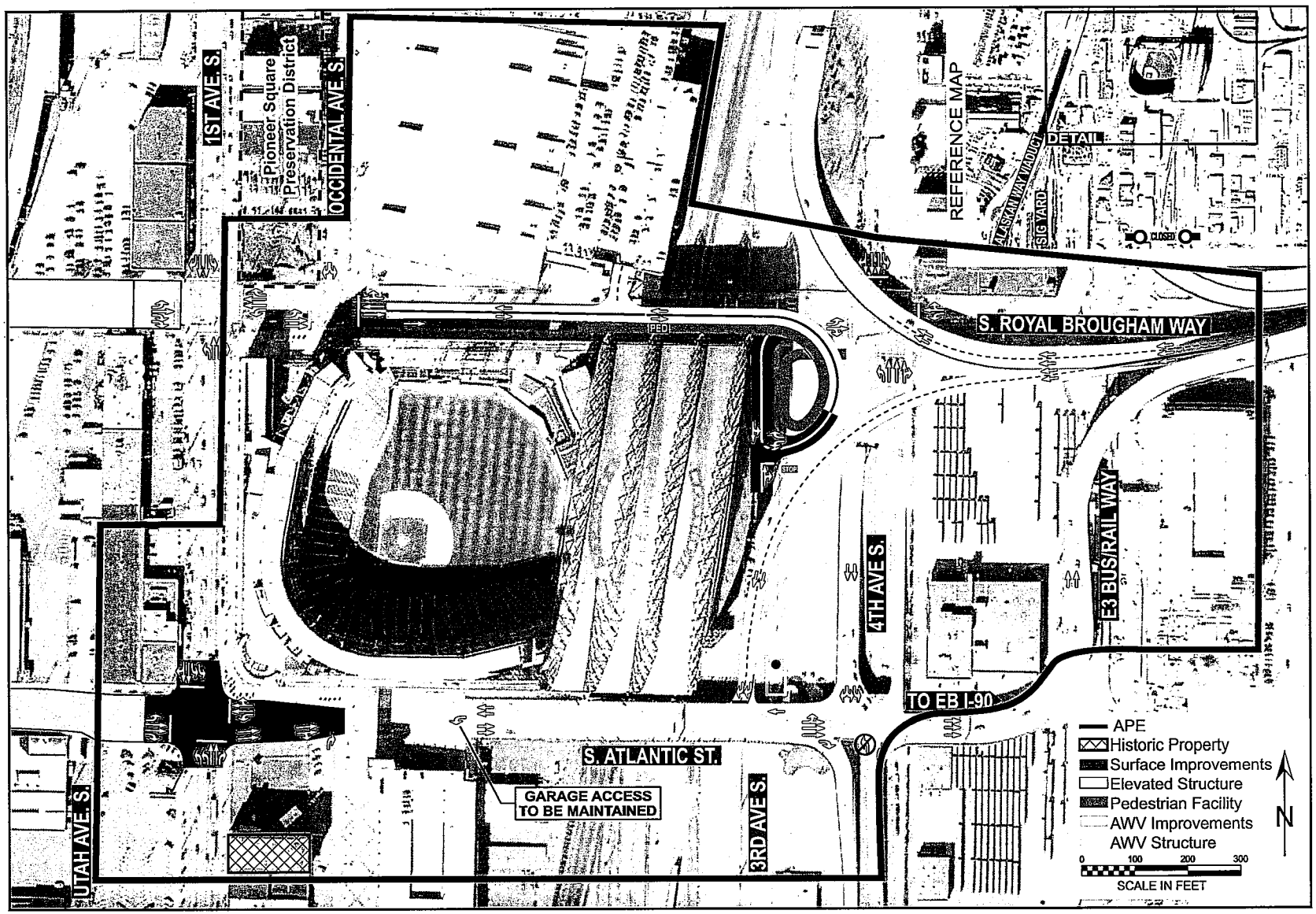


Figure 1. SR 519 area of potential effects (APE).



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April 5, 2007

Honorable Leonard Forsman
Suquamish Tribe
P.O. Box 498
Suquamish, WA 98292

Re: SR 519 INTERMODAL ACCESS PROJECT

Dear Chair Forsman:

The Washington Department of Transportation (WSDOT), acting on behalf of the Federal Highway Administration (FHWA), is proposing an undertaking to address an identified transportation need in downtown Seattle, King County, Washington. The purpose the SR 519 Intermodal Access Project is to provide for increased mobility and safety by improving connections between I-5/I-90, the Port of Seattle, waterfront commercial interests (including State ferries), and recreational/sports facilities in the downtown area.

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Kate Stenberg
Project Environmental Manager

Enclosures

Cc: Steve Boch, FHWA
Kenneth Juell WSDOT
Matthew Sterner, DAHP
Dennis Lewarch, Suquamish Tribe

Washington State Department of Transportation
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July 3, 2007

Dennis Lewarch
Suquamish Tribe
P.O. Box 498
Suquamish, WA 98292

Re: SR 519 INTERMODAL ACCESS PROJECT, PHASE 2: ATLANTIC CORRIDOR

Dear Mr. Lewarch:

Per provisions of 36CFR800.2(c)(2), the Washington Department of Transportation (WSDOT), acting on behalf of the Federal Highway Administration (FHWA), is continuing consultation on the SR 519 Intermodal Access Project. Enclosed please find the project Area of Potential Effects (APE), which was determined by Cultural Resources Specialists Connie Walker Gray and Ken Juell per 36CFR800.4(a)(1) and includes the areas of proposed construction and one tax parcel adjacent to the work areas, the latter to consider any indirect project effects.

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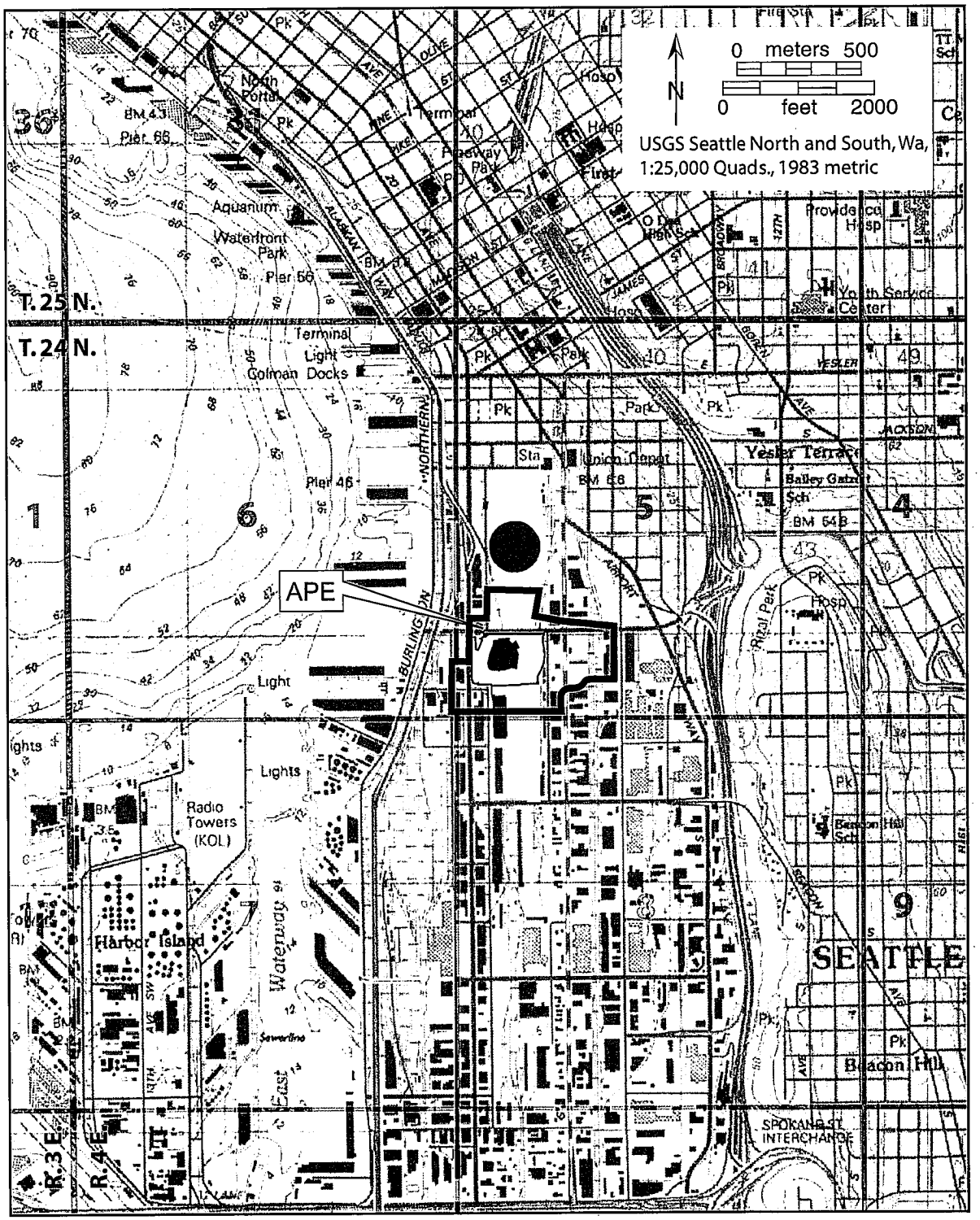
Sincerely,

Kate Stenberg
Project Environmental Manager

Enclosures

Cc: Steve Boch, FHWA
Ken Juell, WSDOT
Don Seeberger, WSDOT
Sandie Turner, WSDOT
Matthew Sterner, DAHP



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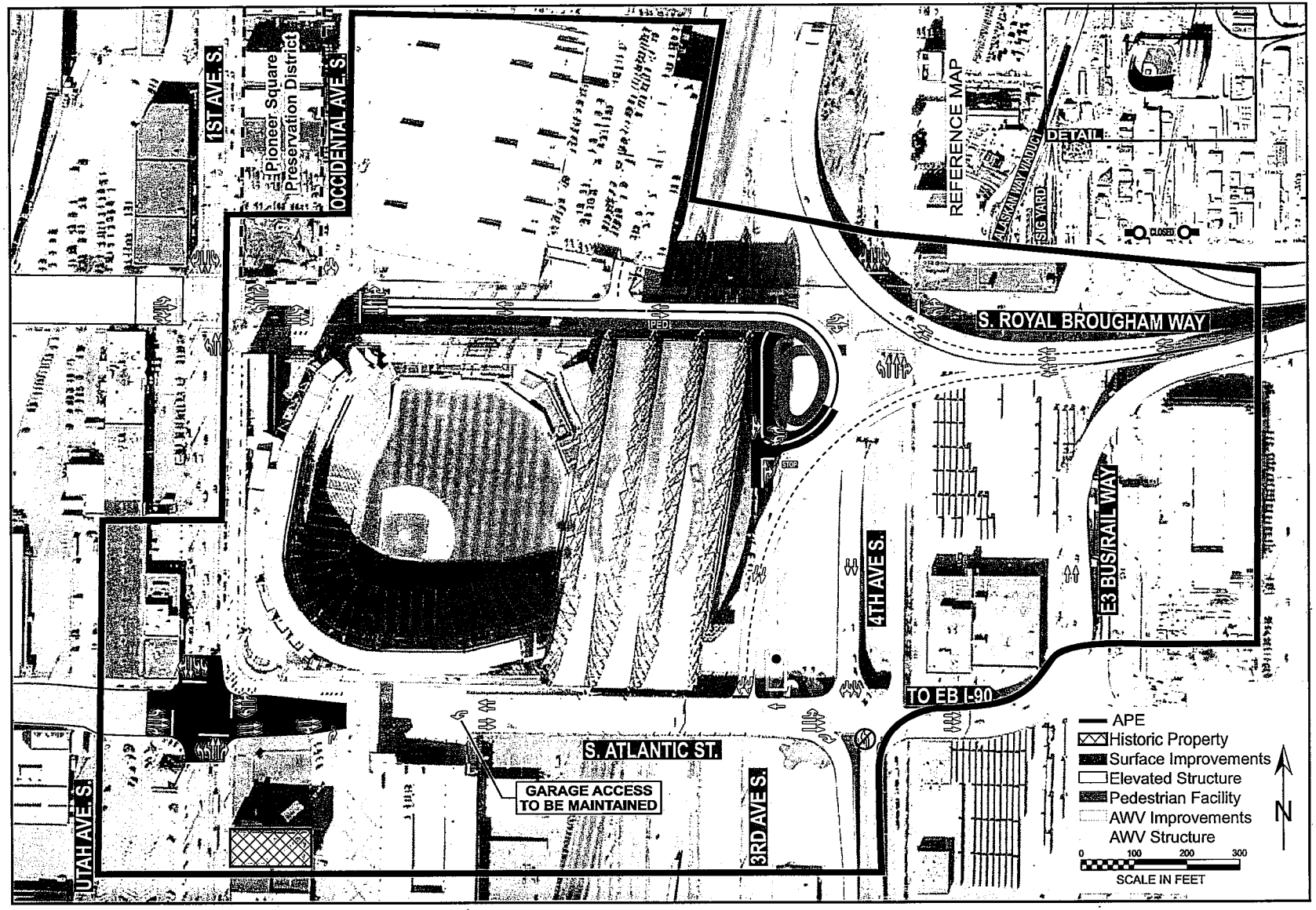

Figure 2. SR-519 APE.

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April 5, 2007

Honorable Stanley G. Jones, Sr.
Tulalip Tribes
6700 Totem Beach Rd,
Marysville, WA 98271

Re: SR 519 INTERMODAL ACCESS PROJECT

Dear Chair Jones:

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Sincerely,

Kate Stenberg
Project Environmental Manager

Enclosures

Cc: Steve Boch, FHWA
Kenneth Juell WSDOT
Matthew Sterner, DAHP
Hank Gobin, Tulalip Tribes

Washington State Department of Transportation
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July 3, 2007

Hank Gobin
Tulalip Tribes
6410 23rd Avenue NE
Tulalip, WA 98271

Re: SR 519 INTERMODAL ACCESS PROJECT, PHASE 2: ATLANTIC CORRIDOR

Dear Mr. Gobin:

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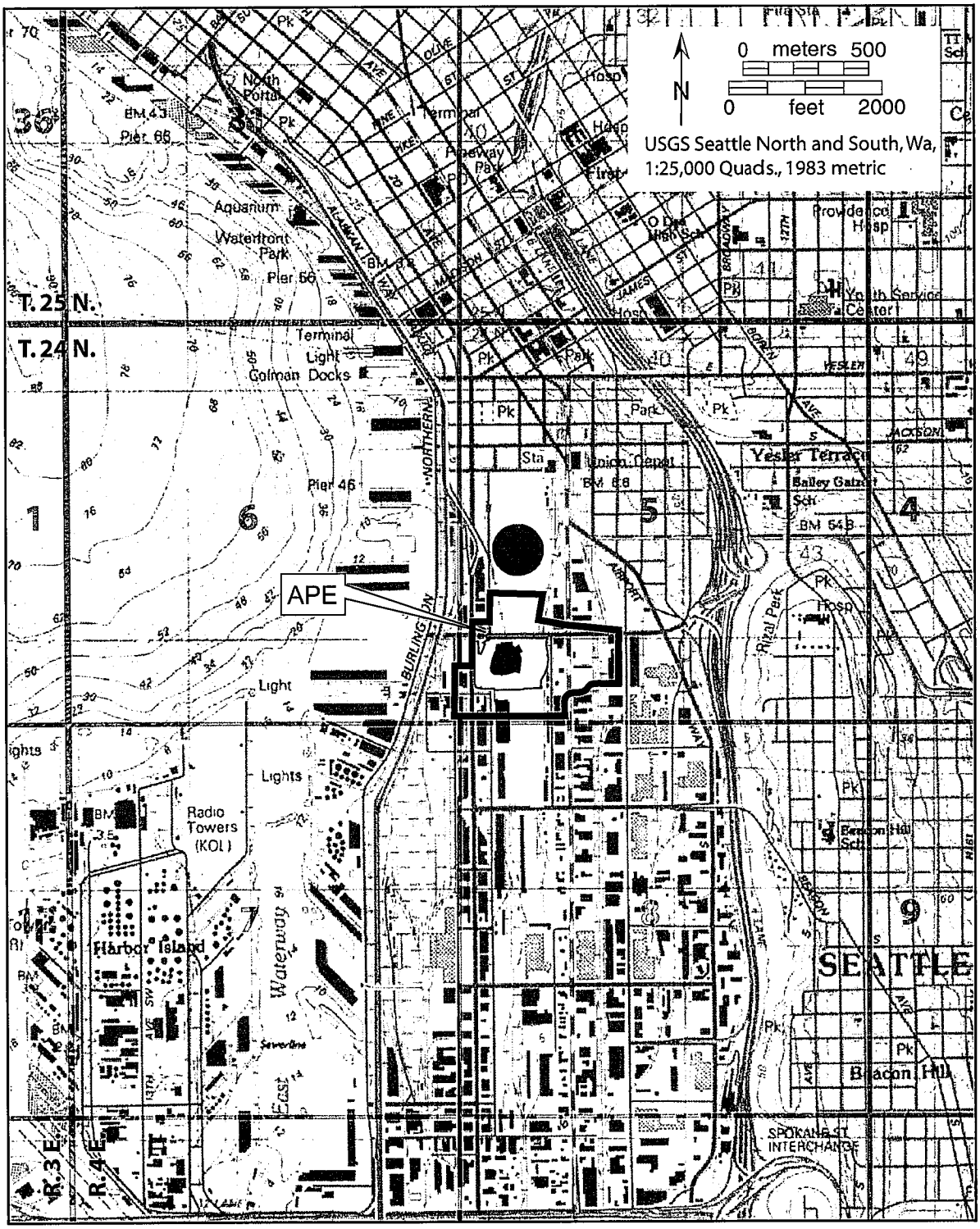

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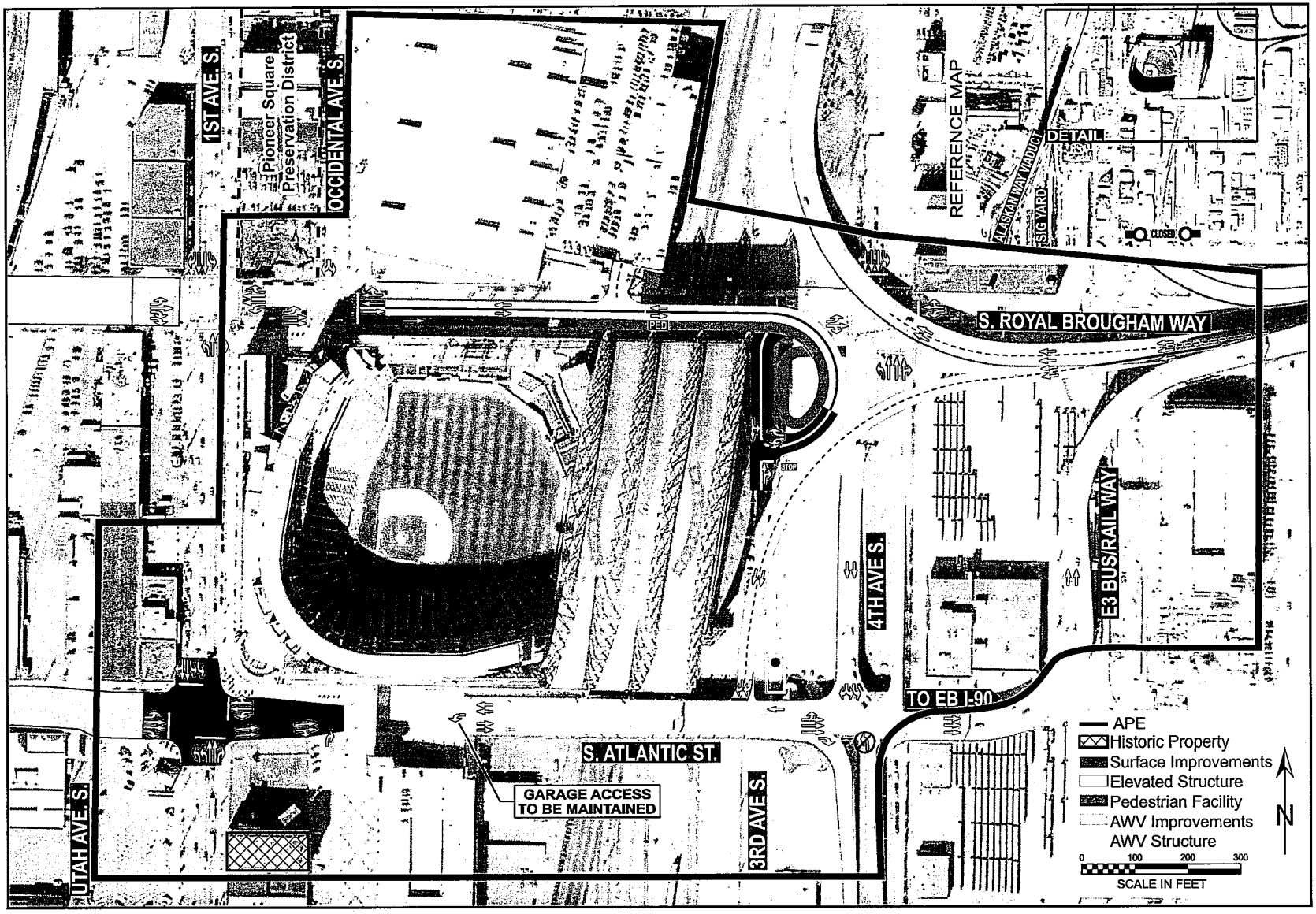

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April 5, 2007

Honorable Lavina Washines
Yakama Nation
P.O. Box 151
Toppenish, WA 98948

Re: SR 519 INTERMODAL ACCESS PROJECT

Dear Chair Washines:

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Enclosures

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Kenneth Juell WSDOT
Matthew Sterner, DAHP
Kate Valdez, Yakama Nation
Johnson Meninick, Yakama Nation

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July 3, 2007

Johnson Meninick
Yakama Nation
P.O. Box 151
Toppenish, WA 98948

Re: SR 519 INTERMODAL ACCESS PROJECT, PHASE 2: ATLANTIC CORRIDOR

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Matthew Sterner, DAHP
Kate Valdez, Yakama Nation

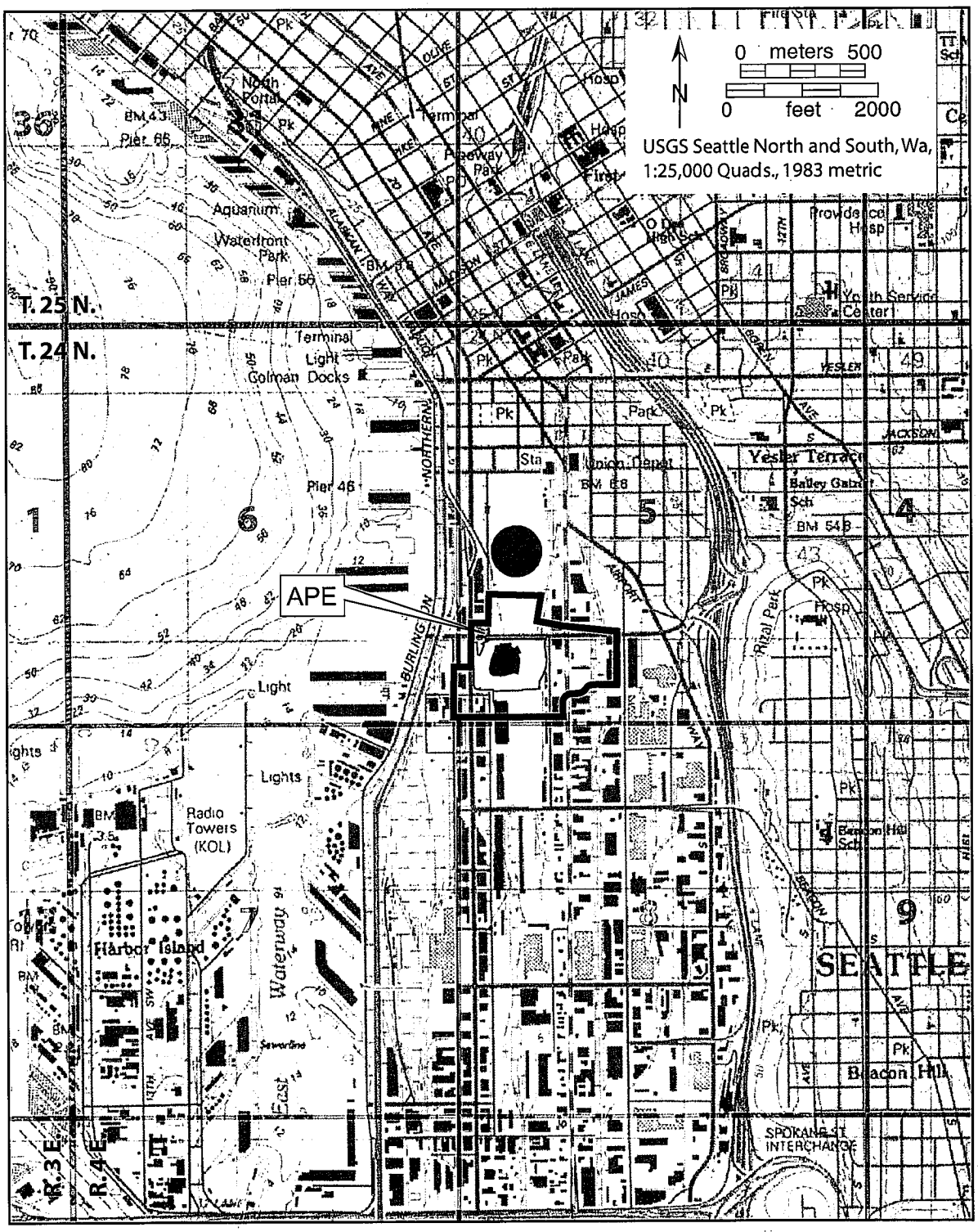


Figure 1. SR 519 area of potential effects (APE).

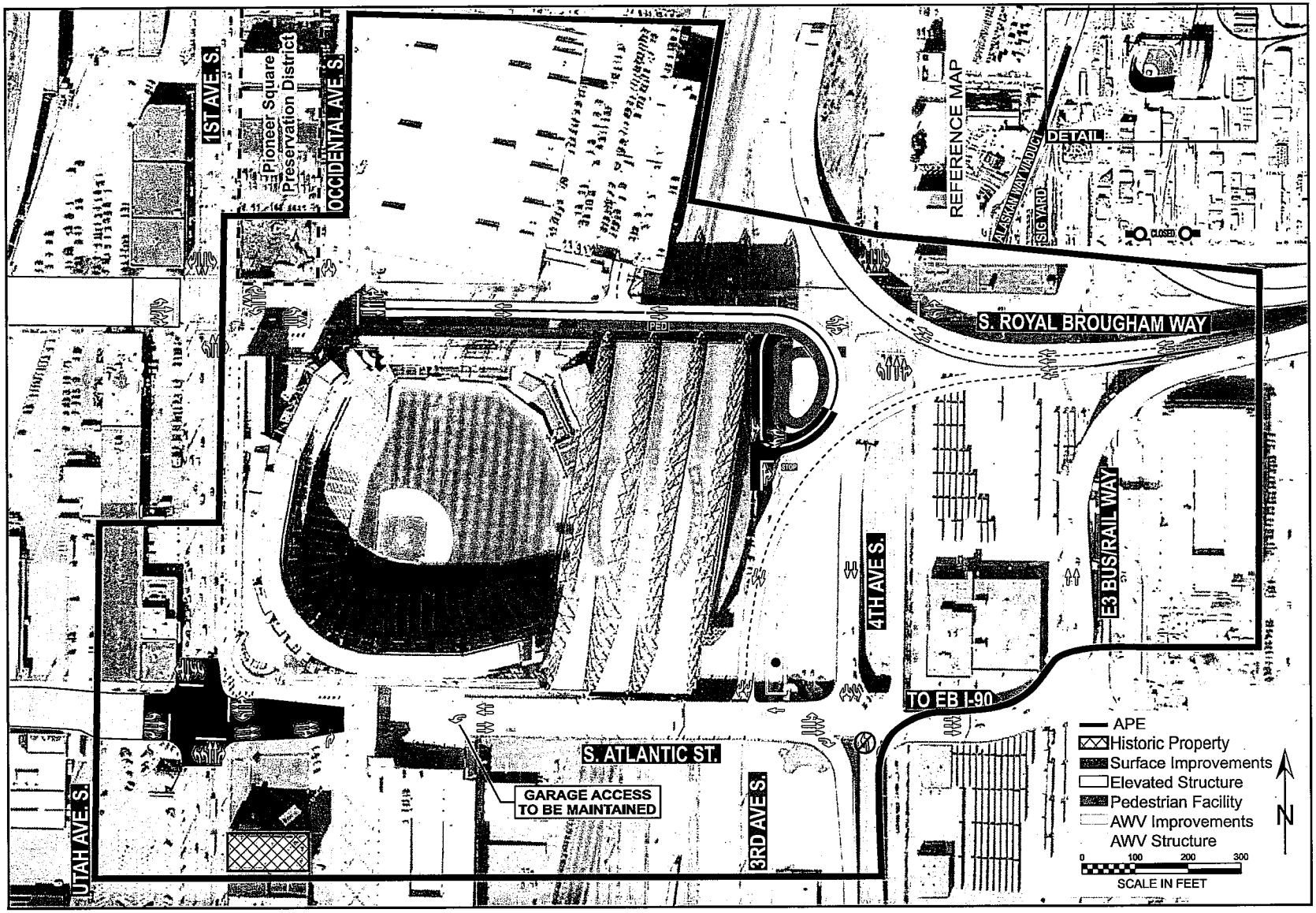


Figure 2. SR-519 APE.

Washington State Department of Transportation

Northwest Washington Division
Urban Corridors Office
401 Second Avenue South, Suite 400
Seattle, WA 98104
206-464-1236/Fax 206-716-1101
www.wsdot.wa.gov

July 2, 2007

Allyson Brooks, PhD
Washington State Historic Preservation Officer
Department of Archaeology and Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Re: SR 519 INTERMODAL ACCESS PROJECT, PHASE 2: ATLANTIC CORRIDOR

Dear Dr. Brooks:

Per provisions of 36CFR800.3(a), the Washington Department of Transportation (WSDOT), acting on behalf of the Federal Highway Administration (FHWA), is proposing an undertaking to address an identified transportation need in downtown Seattle, King County, Washington. The purpose the SR 519 Intermodal Access Project is to provide for increased mobility and safety by improving connections between I-5/I-90, the Port of Seattle, waterfront commercial interests (including Washington State ferries), and recreational/sports facilities in the downtown area. In order to ensure that we take into account the effects of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places, the WSDOT is initiating formal Section 106 consultation per 36CFR800.2(c)1. WSDOT will be directly managing the cultural resources studies and carrying out this undertaking. The APE, determined by Cultural Resources Specialists Connie Walker Gray and myself per 36CFR800.4(a)(1), includes the areas of proposed construction and one tax parcel adjacent to the work areas, the latter to consider any indirect project effects.

This current project is actually Phase 2 of the SR 519 Intermodal Access Project. During Phase 1, WSDOT constructed the new South Atlantic Street (Edgar Martinez Way) on-ramps to I-5 and I-90 and an overpass to separate road and rail traffic. The new connections increased safety and improved access to Port of Seattle, waterfront, and stadium areas for freight, ferry, and event traffic. Phase 1 connections opened to traffic in spring 2004.

The purpose of Phase 2 of the project is to eliminate the remaining safety issues related to surface-level rail crossings at South Royal Brougham Way. As part of the environmental assessment (EA), WSDOT will evaluate the Atlantic Corridor design, which includes:

- Westbound off-ramp from I-5 to I-90 to the current South Atlantic Street overpass.
- Improvements at two intersections: First Avenue and South Atlantic Street and South Atlantic Street and Occidental Street.
- Grade-separated crossings for both vehicles and pedestrians at South Royal Brougham Way.

Enclosed please find the project Area of Potential Effects (APE) on two maps. The APE is located in Township 24N, Range 4E, Section 05, and includes the proposed construction areas where ground disturbance is possible and the tax parcels adjacent to the work areas. The project area overlaps with some large tax parcels to the north and south, associated with the Public Facilities District, Public Stadium Authority, Burlington Northern Santa Fe Railway, King County, and other private land owners. Where parcels are very large, the APE includes only the occupying building and the lot portion between the building and work areas, but omits the more distant portion of the parcel. The vertical APE includes the entire depth of planned construction disturbance where confined to fill and Holocene deposits, or the entire depositional sequence above glacial sediments that consists of Holocene estuarine deposits and imported fill resting on the historic tide flats. The Holocene and fill deposits are approximately 40 feet thick, based on geotechnical bores acquired during multiple previous projects in the area.

Your timely response to this letter, acknowledging your interest in participating in this undertaking as a consulting party, and in commenting on our determination of the project's Area of Potential Effects (APE), is greatly appreciated. We are also inviting comments on the proposed project from the identified concerned tribes, including the Muckleshoot Indian Tribe, the Suquamish Tribe, the Snoqualmie Tribe, the Tulalip Tribes, and the Yakama Nation, and the non-federally recognized Duwamish Tribe. Should you have any questions about this project, you may contact me at 206-464-1236 or juellk@wsdot.wa.gov, Connie Gray at 206-716-1138 or grayc@wsdot.wa.gov, or Kate Stenberg, Project Environmental Manager at 206-382-5279 or stenbek@wsdot.wa.gov.

Sincerely,

Kenneth E. Juell
Cultural Resources Specialist

Enclosures

Cc: Steve Boch, FHWA
Kate Stenberg, WSDOT
Don Seeberger, WSDOT
Sandie Turner, WSDOT

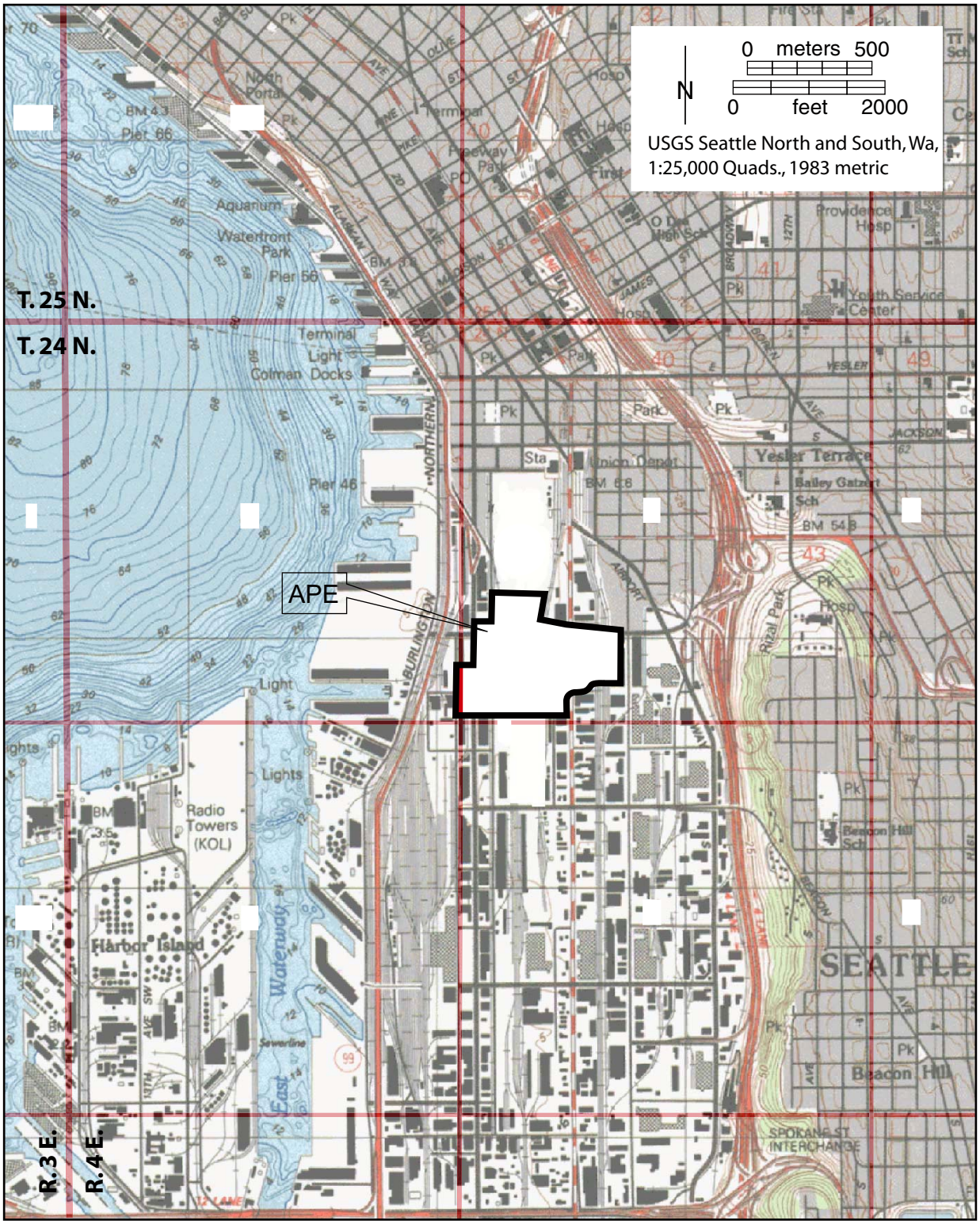


Figure 1. SR 519 area of potential effects (APE).

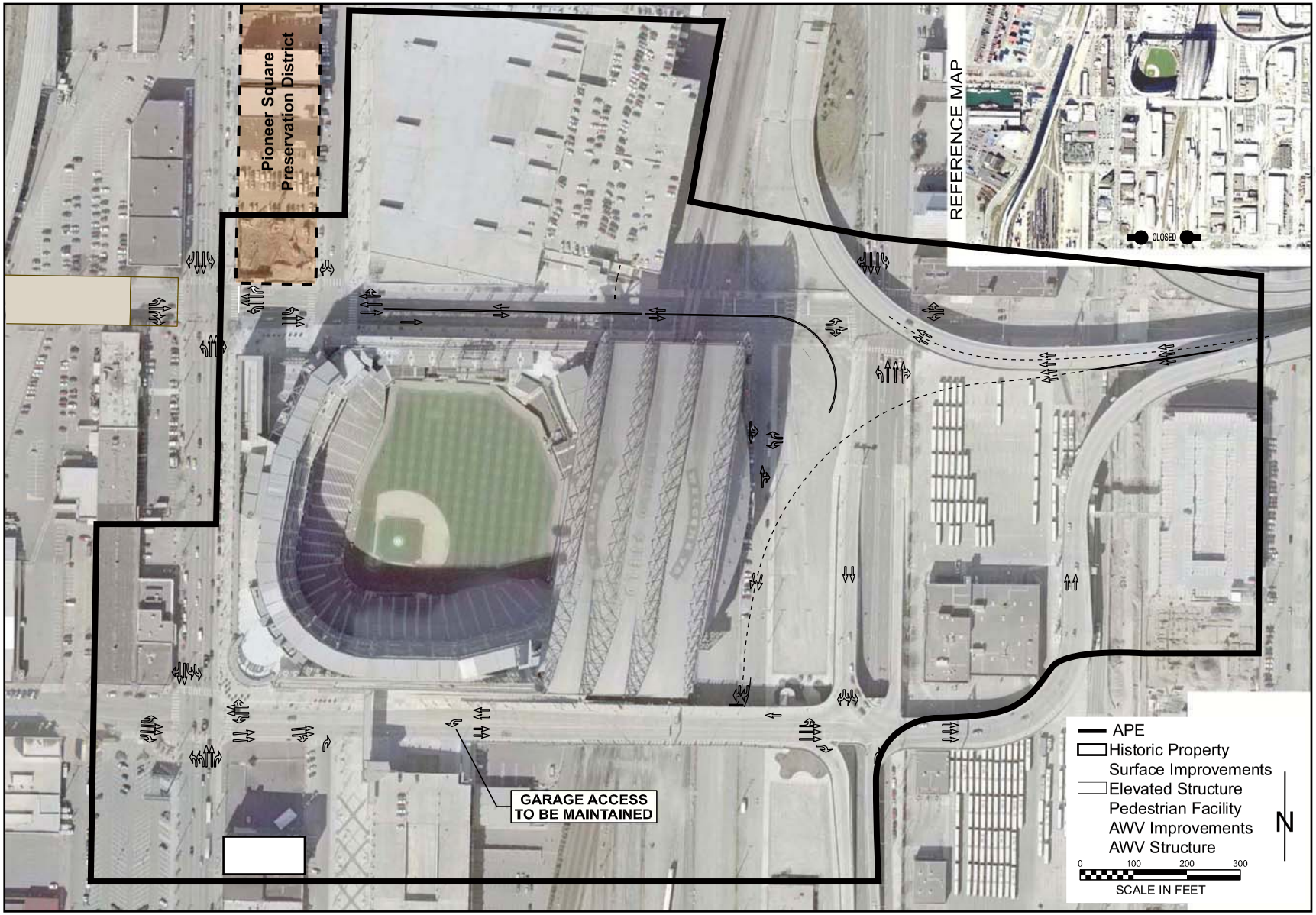
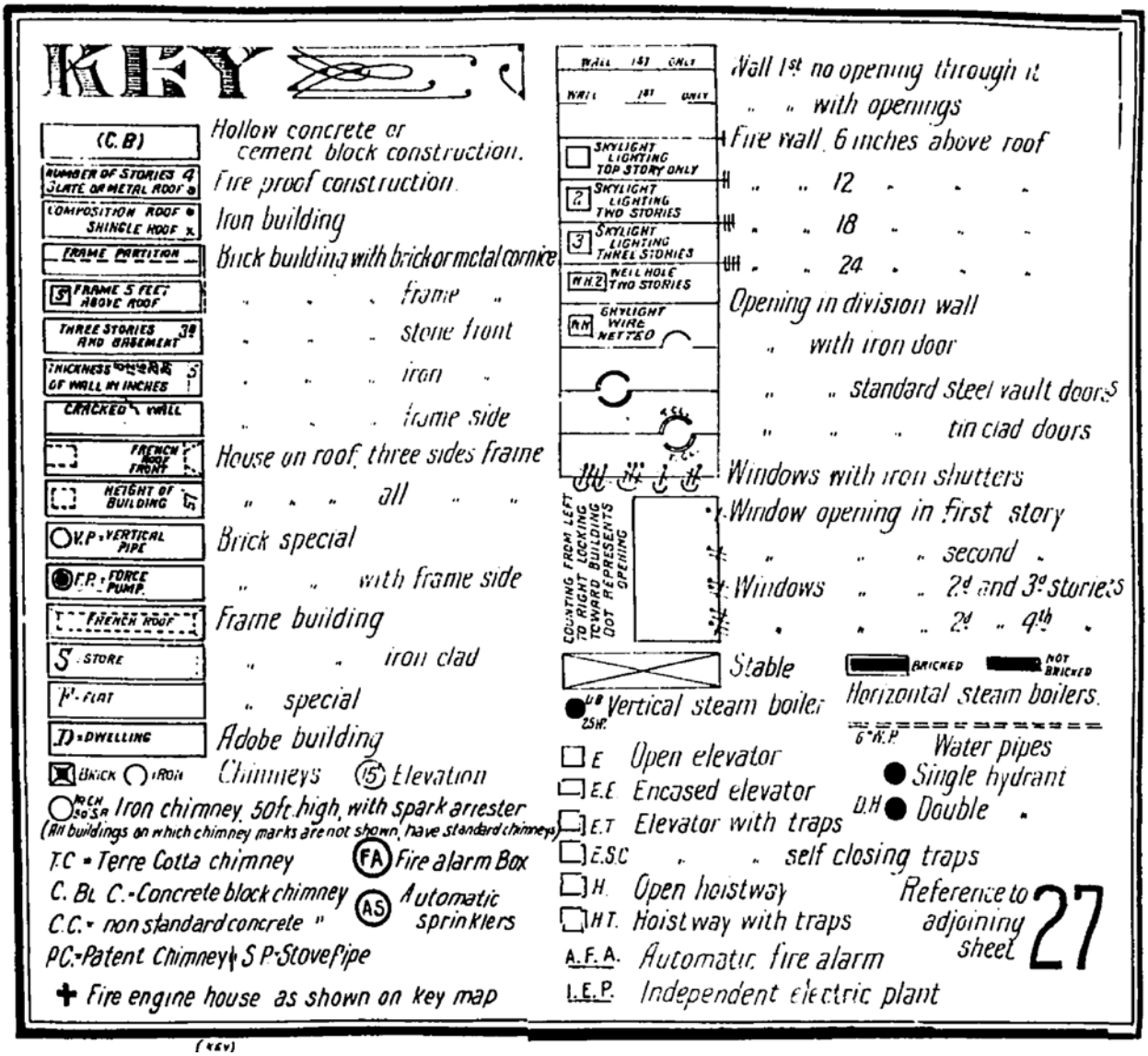


Figure 2. SR-519 APE.

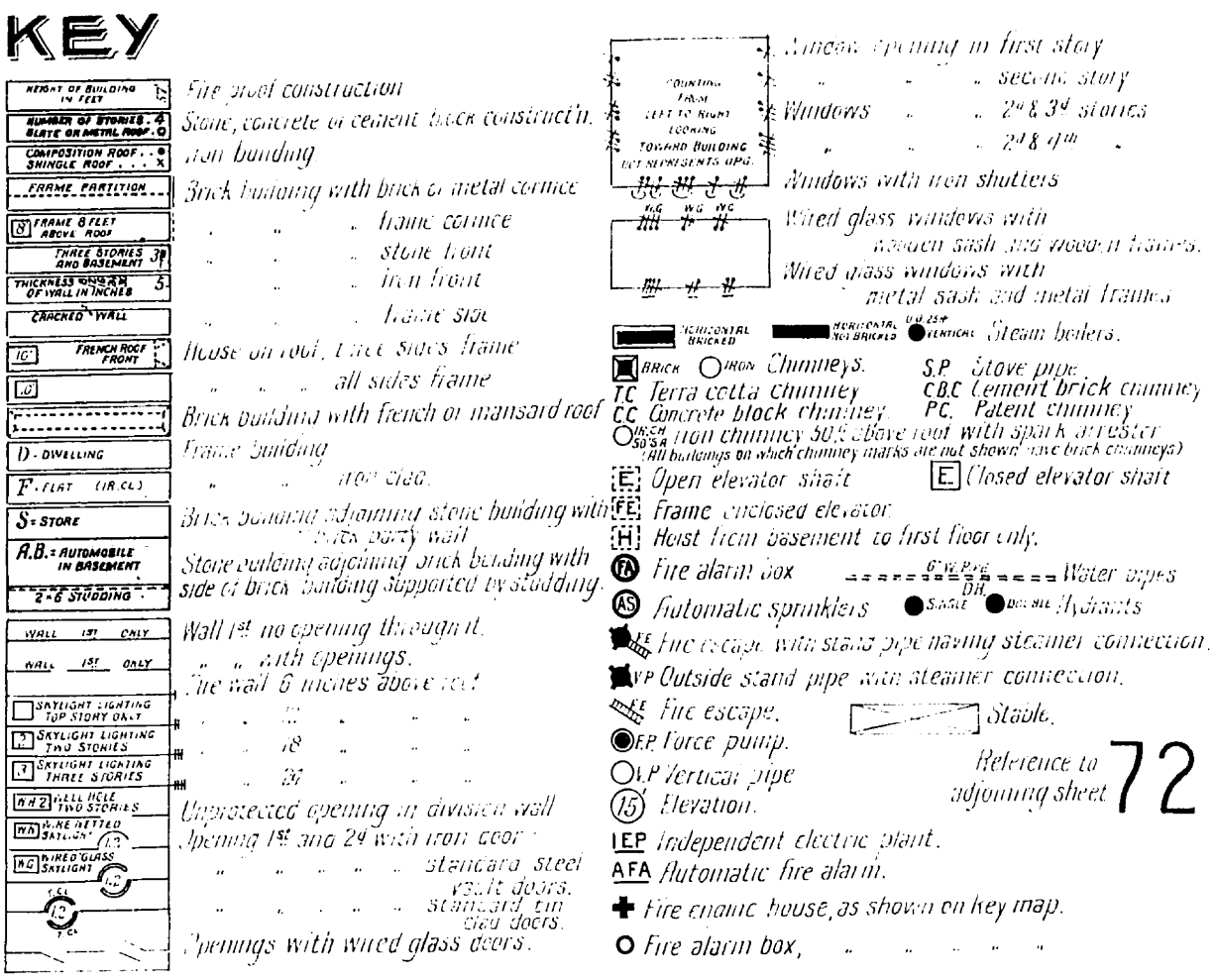
Appendix B: Sanborn Fire Insurance Maps

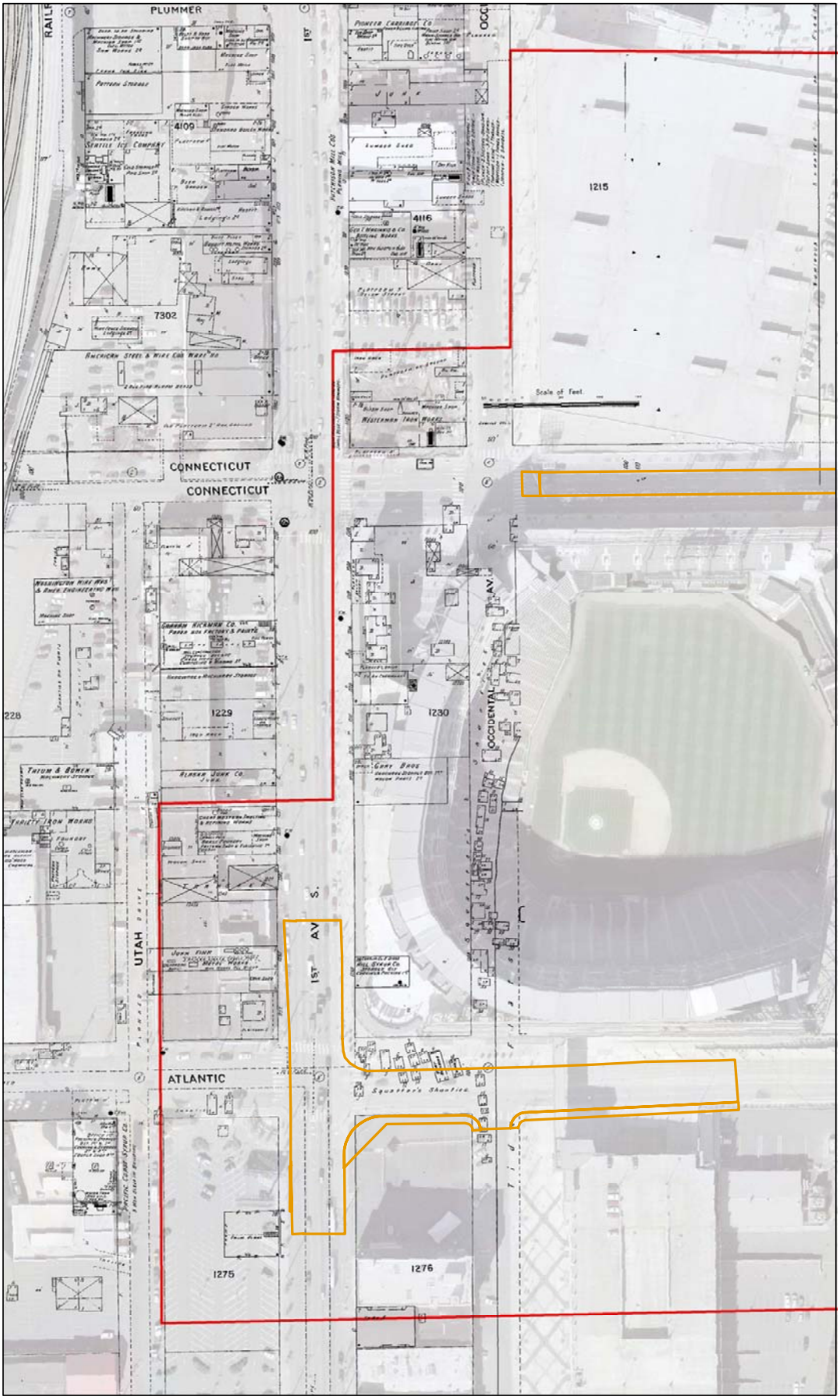
Sanborn Fire Insurance Maps. Digital Sanborn Maps, 1867-1970. The Sanborn Map Company, Sanborn Library, LLC. ProQuest Information and Learning Company. http://sanborn.umi.com/.

Sanborn Fire Insurance Map Key, 1904



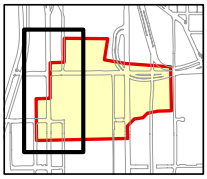
Sanborn Fire Insurance Map Key, 1916 and 1950





Map 1: 1904 Sanborn Map over modern air photo.

Key Map:



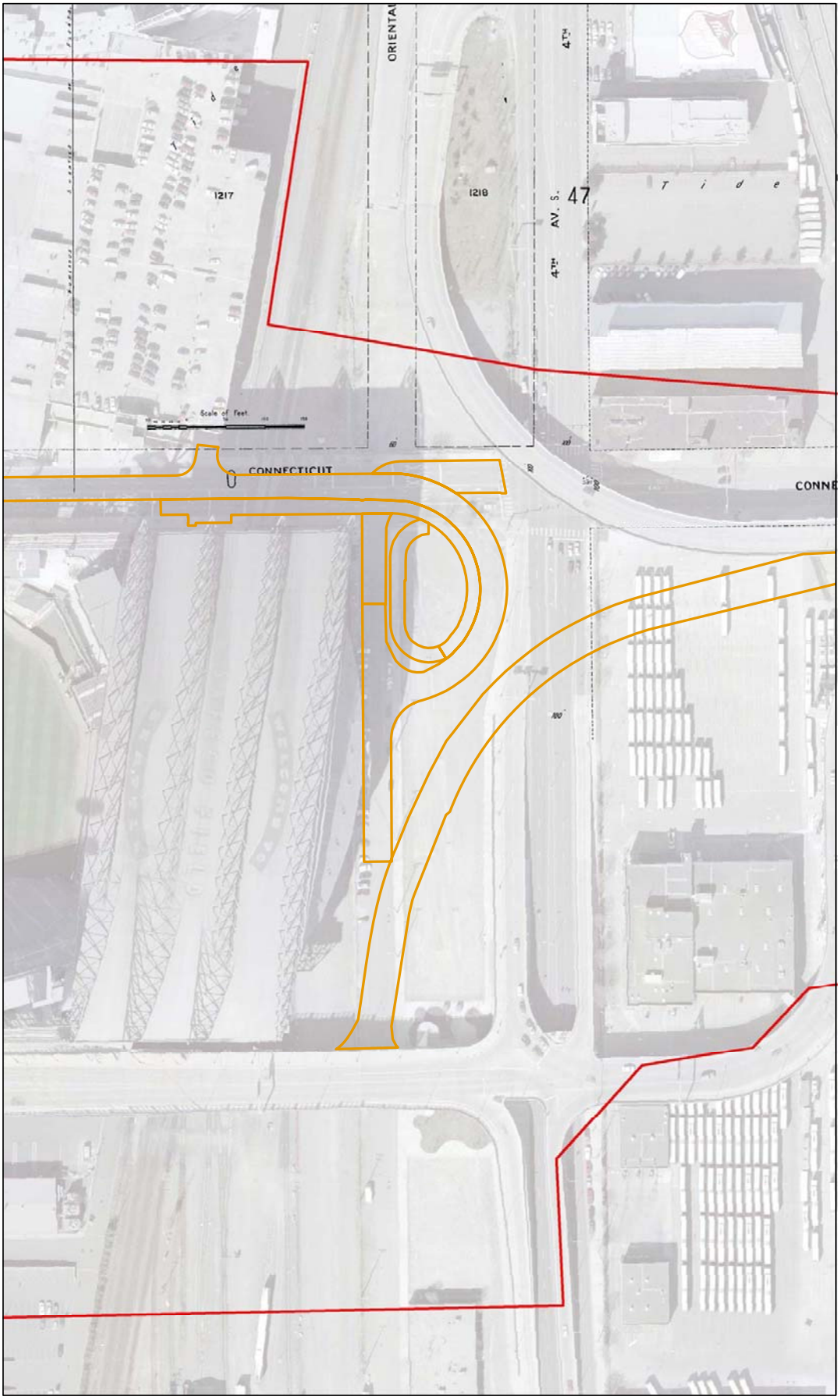
Legend

Project Area

APE

0 10 20 30 40 Meters

0 40 80 120 160 Feet



Map 2: 1904 Sanborn Map over modern air photo.

Legend

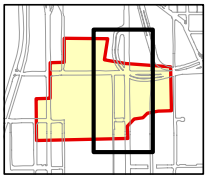
Project Area

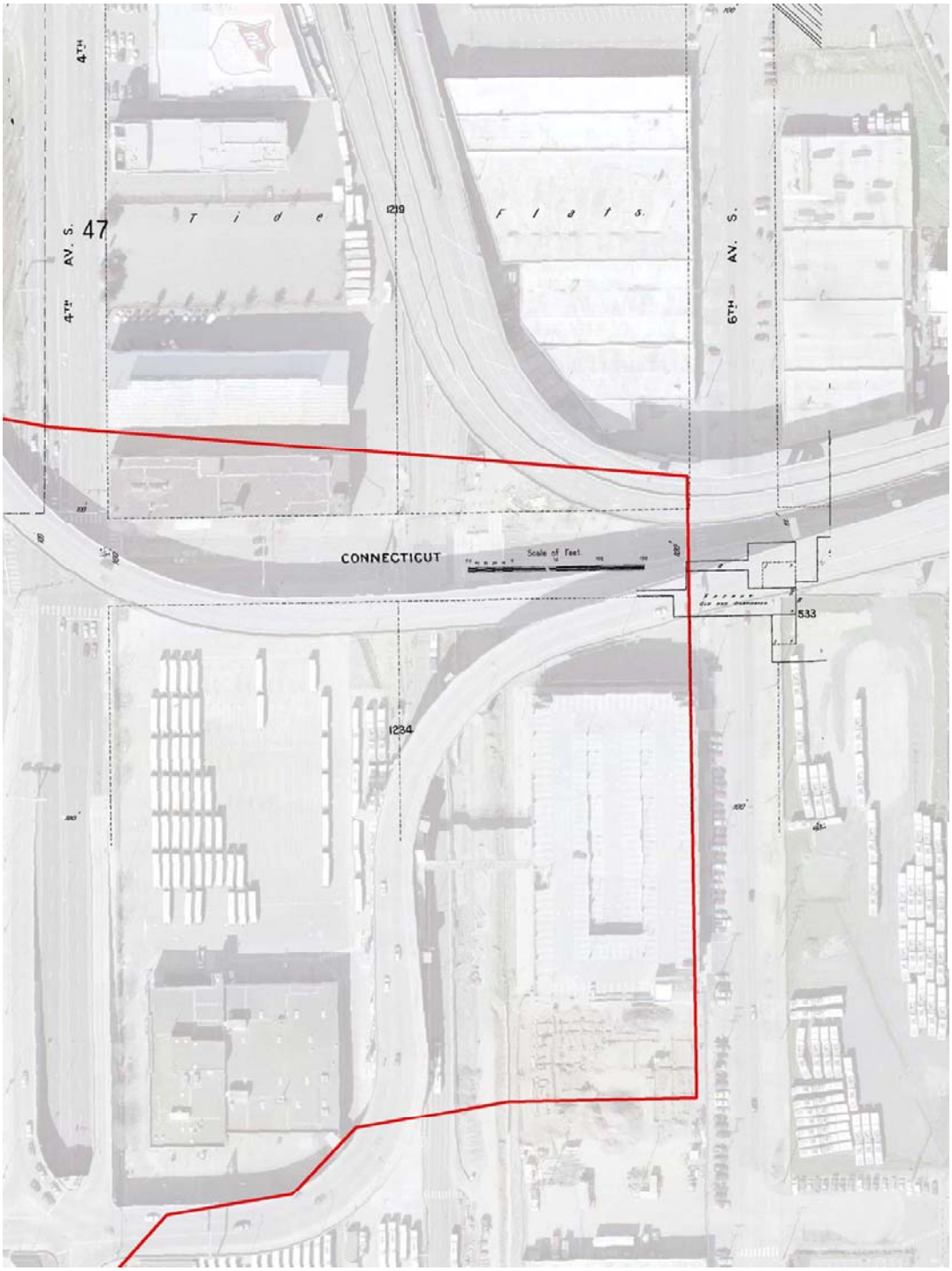
APE

0 10 20 30 40 Meters

0 40 80 120 160 Feet

Key Map:




47
4TH AV. S.
4TH
Tide
129
Flats
6TH AV. S.
CONNECTICUT
Scale of Feet
533
1234

SR 519 Intermodal Access Project
Phase 2: South Atlantic Corridor

Addendum to Cultural Resources Discipline Report: Results of Supplemental Archaeological Investigations

Prepared for

U.S. Department of Transportation
Federal Highway Administration

Washington State Department of Transportation

Prepared by

Northwest Archaeological Associates, Inc./Environmental History Company

January 17, 2008

[redacted]

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FIGURES

TABLES

APPENDICES

Chapter 1 Summary

The Northwest Archaeological Associates, Inc./Environmental History Company (NWAA/EHC) team conducted an archaeological coring program for the SR 519 Intermodal Access Project, Phase 2: South Atlantic Corridor planned by the Washington State Department of Transportation. The project is just south of downtown Seattle in an area of filled tidelands, east of SR 99, west of Interstate 5 (I-5), and adjacent to Qwest Stadium and Safeco Field, in Section 5, Township 24 North, Range 4 East, Willamette Meridian. Elliott Bay and the Duwamish Waterway are about one-half mile west of the project. Surface streets within the project include First Avenue South, Third Avenue South, Fourth Avenue South, South Royal Brougham Way, and South Atlantic Street. The area of potential effects (APE) includes areas proposed for stormwater conveyance facilities, shafts for support columns or foundation footings, trenches for curtain walls, areas for stone columns and jet grouting, as well as ancillary areas including those proposed for construction staging. The proposed maximum depth of excavation is 80 feet, but cultural material was anticipated to be within the upper 50 feet which includes historical tideland fill material and Holocene deposits extending down to the contact with basal glacial sediments.

The coring program supplements the project's previous cultural resources assessment report which examined existing archaeological and historical information, and collated existing geotechnical data (Hudson et al. 2007). Because of impervious surfaces throughout the study area, the previous field assessment was limited to examining above-ground buildings and structures potentially affected by the proposed project and recommended further fieldwork, specifically, retrieval of several sonicores from proposed elevated structure support columns and backhoe trenching at the southeast corner of 1st Ave S and South Atlantic Street. The initial assessment also identified a previously recorded building within the APE, the Frederick and Nelson Warehouse, which is eligible for the National Register of Historic Places, and the Pioneer Square Preservation District, a city designation, a portion of which is intersected by the project. Neither the building nor the district will be affected by the SR 519, Phase 2 project.

1.1 Methods

Boreholes were drilled with a rotosonic drill from which continuous cores were extruded into plastic sleeves for transport to the NWAA archaeological core processing station in downtown Seattle. Once at the lab, the cores were logged, sampled by depositional layers, and processed using methods consistent with those employed by the NWAA/EHC team for analysis of

archaeological sonicores drilled for the nearby Alaskan Way Viaduct and Seawall Replacement Program (Miss et al. 2007). Geoarchaeological observations were recorded as graphical logs depicting the vertical depositional sequence for each core, and after logging, the cores were bulk sampled, water-screened, and each sample examined for archaeological residues.

1.2 Results

Eighteen boreholes, totaling 821 drilled linear feet, were drilled to sample areas of ground disturbance on proposed pier locations and in an area for a proposed retained fill and walls at the base of the Royal Brougham rail overcrossing loop. The borehole sampling resulted in a T-shaped pattern within the project area in which six boreholes (SC-1, -2, -4, -6, -13, and -16) comprised the west-to-east transect while the remaining boreholes extended south from borehole SC-6 to S. Atlantic Street. Total drilled depths varied from 40 to 50 feet below the modern surface (fbs). Approximately 60 percent (or 495 linear feet) of the cores were archaeologically sampled for a total sample volume of 135 cubic feet.

Vertical depositional sequences encountered in the boreholes included sediments representing the historic fill, Holocene sediments, and the upper portion of the basal Pleistocene sediments. The historic fill group of sediments was a simple sequence and consisted of mostly undifferentiated fill facies resting atop clay and sand facies. The Holocene sediments under the historic fill sequence included a broader variety of facies, but consisted predominantly of layers of silt and clay representing typical sedimentation patterns associated with subtidal and intertidal depositional environments. Three boreholes (SC-2, -13, and -16) encountered the top of Pleistocene sediments between 40 and 45 fbs.

Archaeological materials were recovered from 16 boreholes, and were predominantly historic debris and refuse recovered in the uppermost portions of the boreholes from vactored (Vacc) or undifferentiated fill (Undiff). The highest densities of materials were recovered from the boreholes in the north-to-south transect south of SC-6, which are within the block bordered by S. Royal Brougham Way to the north and S. Atlantic Street to the south, and bounded on the west and east by 3rd Ave S and 4th Ave S, respectively. The 1916 Sanborn Fire Insurance Map of the block shows there were no buildings or structures in the block at that time, and 4th Ave S was elevated on a trestle about 27 feet above the tideflat surface. By as late as 1950, after the tideflat in this area was filled, there were still only a few commercial establishments, such as a grocery (SC- 5 and -6), a cold storage warehouse (just north of SC-17 and -18) and a restaurant (east of SC-9 and -10), occupying the block. The bulk of the historical archaeological materials was found in the upper 10 feet of the historic fill overlying a massive clay facies, and the relative highest densities of artifacts occur in the vicinity of former buildings and structures in the upper 3 to 10 fbs. These artifacts presumably represent reworking and demolition material from razing of the buildings.

Occasional deposits of archaeological materials were found deeper in the boreholes, and these were predominantly glass and ceramic fragments but included low densities of other materials such as brick and metal. Presumably, these archaeological deposits were formed as a result of low-level, ongoing unregulated refuse discard as the block was slowly developed. The exception to the general pattern was found in boreholes SC-5 and SC-11 where low-density but diverse deposits of archaeological materials were found in undifferentiated fill facies underlying massive clayey sediments. The diversity of artifact types and stratigraphic position of these deposits under the clay and close to the contact with tideflat surface suggest they may represent early-period primary discard locations.

In general, the low variability exhibited in the vertical depositional sequences and the overall low density of archaeological materials are consistent with historical documents and previous geotechnical studies indicating the project area saw little commercial or industrial development until after 1916 as the final areas of the tideflats were filled in.

No pre-contact archaeological materials were identified at the contact with the underlying Holocene sediments nor in the upper intertidal portion of the Holocene sequence.

1.3 Recommendations

1) The area surrounding the coring locations in the area of Boreholes SC-5 and SC-11 should be archaeologically monitored between 16 and 25 fbs, and means provided for the onsite archaeologist to recover any data related to archaeological resources. The excavated spoils should be kept separated from the other shaft spoils;

2) Excavations for the proposed signal pole and catch basin at the southeast corner of 1st Ave S and South Atlantic Street would extend into the upper historic fill in an area noted in the Cultural Resources Discipline Report (Hudson et al. 2007) to have contained a number of shanties near the area of Shacktown. Materials from backhoe trenching to install the catch basin and from augering for the signal pole should be investigated to recover any archaeological data and;

3) An Unanticipated Discovery Plan (UDP) should be drawn up and made available to construction personnel onsite. The plan would include a list of contacts and protocols to follow in the event archaeological materials, human remains, or mortuary goods are unearthed during implementation of the project.

Chapter 2 Project Description

The Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT) propose to increase traffic mobility and safety on State Route (SR) 519, in Seattle, Washington. This project may affect historic properties and thus is an undertaking as defined by the National Historic Preservation Act (NHPA). The project is also subject to Section 4(f) of the Department of Transportation Act (49 USC 303). A team composed of Northwest Archaeological Associates, Inc. and the Environmental History Company (NWAA/EHC) has prepared this technical memorandum to aid WSDOT in its regulatory responsibilities by identifying historic properties that may be affected by the project.

2.1 Regulatory Context

The environmental process for this project is governed by the National Environmental Policy Act (NEPA) which established the responsibility of the federal government to use all practicable means to preserve important historic, cultural and natural aspects of the national heritage. The NHPA is a separate authority that established as federal policy that federal agencies act as responsible stewards of our nation's resources when their actions affect historic properties. Section 106 of the act requires the agency take into account the effect of an undertaking on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register of Historic Places (National Register). Implementing regulations for Section 106 explicitly provide guidance on how the NEPA and Section 106 processes can be coordinated [Section 800.8(a)] and set forth the manner in which the NEPA process and documentation can be used to comply with Section 106 [Section 800.9(c)]. Identification of historic properties and assessment of effects of the undertaking in a manner consistent with existing NHPA regulations (Section 800.4 through 800.5) are among the provisions. Eligible properties generally must be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria of significance.

Several Washington state laws specifically address archaeological sites and Native American burials. The Archaeological Sites and Resources Act [RCW 27.53] prohibits knowingly excavating or disturbing prehistoric and historical archaeological sites on public or private land without a permit from the Washington Department of Archaeology and Historic Preservation (DAHP). The Indian Graves and Records Act [RCW 27.44] prohibits knowingly destroying

American Indian graves and requires their inadvertent disturbance by construction or other activity to be followed by re-interment under supervision of the appropriate Indian tribe.

RCW 42.56.300 states that records, maps, or other information identifying the location of archaeological sites are exempt from disclosure in order to avoid the looting or depredation of such sites.

On the local level, the City of Seattle's Historic Landmark Preservation Ordinance (SMC 25.12) protects properties of historic and architectural significance. An object, site or improvement that is more than 25 years old may be designated for preservation as a landmark if it has significant character, interest or value as part of the development, heritage or cultural characteristics of the city, state, or nation, if it has integrity or the ability to convey its significance, and if it falls into one of six criteria (SMC 25.12.350). Under the City of Seattle's SEPA regulations, properties that are likely to meet City landmark criteria must be formally reviewed for designation before demolition. This determination and other review decisions concerning landmarks and districts are made by the Seattle Landmarks Preservation Board.

2.2 Project Location

The project is just south of downtown Seattle in an area of filled tidelands, east of SR 99, west of Interstate 5 (I-5), and adjacent to Qwest Stadium and Safeco Field, in Section 5, Township 24 North, Range 4 East, Willamette Meridian (Figure 2-1). Elliott Bay and the Duwamish Waterway are about one-half mile west of the project. Surface streets within the study area include First Avenue South, Third Avenue South, Fourth Avenue South, Fifth Avenue South (the E3 Busway), Occidental Avenue South, South Royal Brougham Way, and South Atlantic Street.

2.3 Area of Potential Effects

The SR 519 Phase 2 Area of Potential Effects (APE) was developed by WSDOT in consultation with affected tribes and the Washington State Historic Preservation Officer (SHPO). The APE includes proposed areas of excavation for storm water facilities, support columns shafts, foundations, and soil stabilization, as well as ancillary construction staging areas. The maximum depth of proposed excavation is 80 feet, however, only the upper 50 feet includes fill and Holocene sediments with potential for archaeological deposits. The vertical APE extends to 50 feet below the ground or street surface.

Sediments of glacial origin below 50 feet have no potential for cultural material. SHPO concurred with the definition of the APE on August 8, 2007.

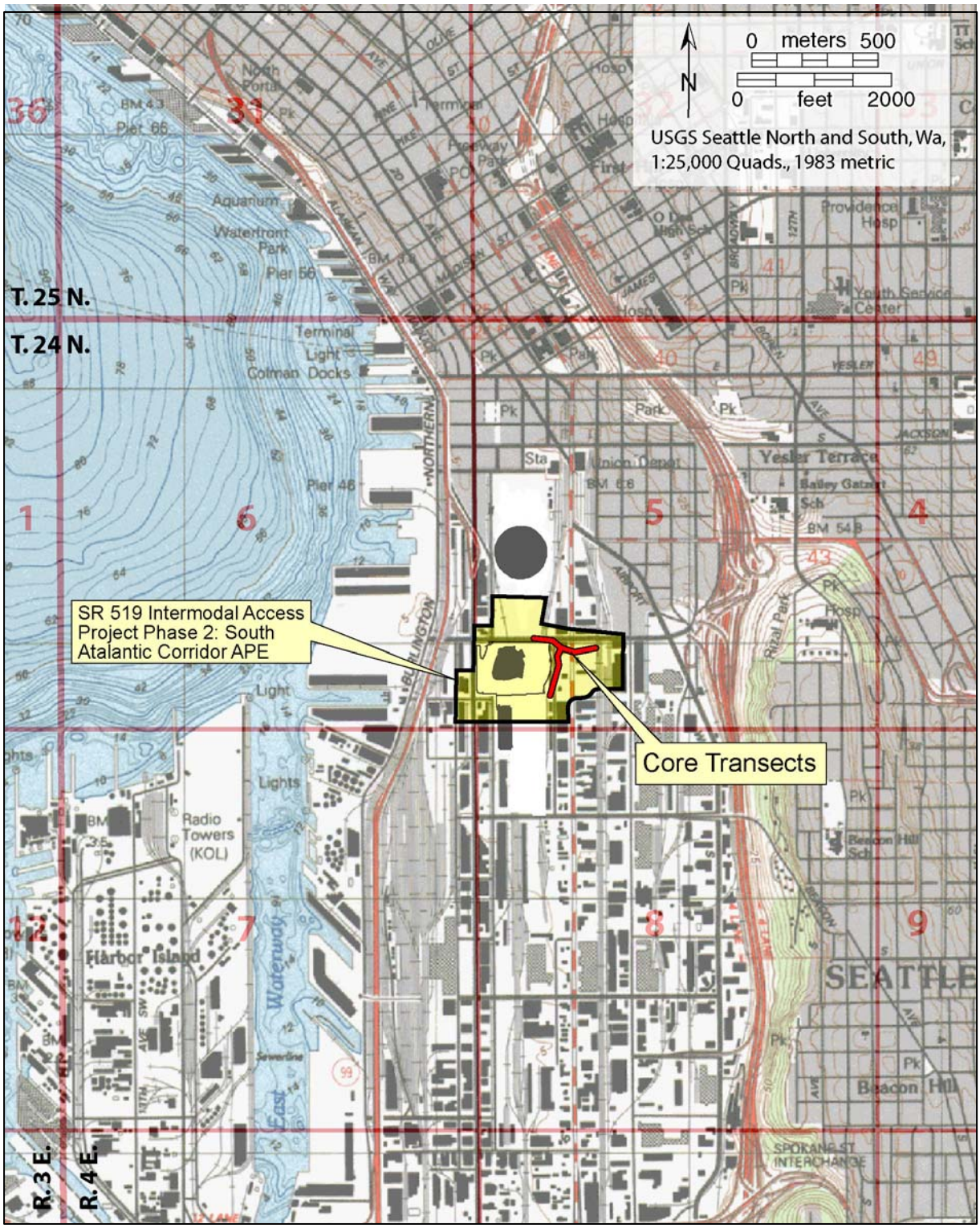

FIGURE 2-1. PROJECT LOCATION

Chapter 3 Methodology

Boreholes were drilled with a rotosonic drill from which continuous cores were extruded into plastic sleeves for transport to the NWAA archaeological core processing station in downtown Seattle. Once at the lab, the cores were logged, sampled by depositional layers, and processed using methods consistent with those employed by the NWAA/EHC team for analysis of archaeological sonicores drilled for the nearby Alaskan Way Viaduct and Seawall Replacement Program (Miss et al. 2007). Geoarchaeological observations were recorded as graphical logs depicting the vertical depositional sequence for each core, and after logging, the cores were bulk sampled, water-screened, and each sample examined for archaeological residues.

3.1 Core Logging

Geoarchaeological observations were recorded as a graphic log depicting the vertical depositional sequence. Variations in the vertical sequence were documented using a classification system that tracks changes in the archaeological and lithological character of the deposits. Each depositional layer in the core was called a lithofacies, which is a depositional unit with distinct observable physical properties such as color, lithology, texture, and sedimentary structure.

The Holocene-aged intact native deposits underlying the historic fill sequence were logged using facies types that were defined using the primary lithologic constituents in each depositional layer. The facies types are classified according to the modal grain size of the depositional layer, indicated with a capital letter. For example, a layer dominated by sand-sized sediments would be designated with the letter "S." Secondary properties were designated by a lower-case letter appearing to the right of the capital letter. The lower case letters may represent secondary constituents of the depositional unit, or may be used as an additional descriptor for the modal grain size. For example, in the facies type **Sz**, "S" indicates that sand is the primary constituent, with "z" (silt) as a secondary component. In the facies type **Sm**, the "S" represents sand, with "m" (massive) describing the bedding type (Table 3-1). All Pleistocene deposits were grouped together as "Pleistocene."

Each depositional layer in the historic fill was also assigned a lithofacies type based on observable properties such as color, texture, and the presence or absence of archaeological materials. Facies comprised of over 20 percent of a cultural material type were assigned a facies type corresponding to

TABLE 3-1. LITHIFACIES TYPOLOGY FOR HOLOCENE SEDIMENTS.

MODAL GRAIN SIZE	SECONDARY PROPERTIES
G – Gravel S – Sand Z – Silt W – Wood	g – gravelly s – sandy z – silty m – massive f – fine d – detrital wood (sea wrack; driftwood)

the dominant material type. For example, a facies with over 20 percent brick fragments in a sandy matrix would be assigned the facies type "Brick." For sedimentary layers in the fill with little to no admixture of archaeological objects or matrix, facies types were assigned based on the primary grain size in the facies. For ease of organization and discussion each facies in the historic fill was also assigned to a facies group (Table 3-2).

TABLE 3-2. LITHOFACIES TYPES AND FACIES GROUPS IN THE HISTORIC FILL SEQUENCE.

GROUP	FACIES
Mass Deposits	Wood
	Lumber
	Sawdust
	Coal
	Cinders
Building Material	Brick
	Brick Paving
	Mortar
Sedimentary Fill Layers	Gravel
	Sand
	Silt
Other	Undifferentiated Fill
	Vactored Fill
	Sample Gap

3.2 Sampling

After the geoarchaeological logging was completed, bulk sediment samples were collected, water-screened, and examined for archaeological residues. Sampling focused on the historic fill and the upper portion of the underlying Holocene sediments.

A minimum measured sample volume of 0.33 cubic feet (approximately 1-1.5 feet in downhole depth) was sought per lithofacies. If the volume of a facies was less than 0.33 cubic foot, the entire facies was sampled. The first three cores (SC-6, -7, and -11) were completely sampled through the historic fill into the upper Holocene sediments. Starting with the fourth core to be processed, SC-12, the thick, massive clay facies were selectively sampled every 3 feet to expedite processing.

Massive deposits such as sawdust or wood, which contained no observable artifacts and very little sediment matrix, were not sampled. The Holocene deposits were sampled starting at the base of the fill and to depths extending between 1 and 15 feet below the contact between the historical fill and the native sediments. Due to the varying thickness of the lithofacies in both the fill and the Holocene deposits, sample size varied in volume from 0.06 to the maximum standard volume of 0.33 cubic feet, with thicker lithofacies yielding multiple samples. Each sample was assigned a unique sequential bag number used to track provenience throughout the screening and analysis process.

3.3 Processing

Because of the small sample volumes and the muddy matrix of most of the artifact-bearing sediments, the cores were water-screened to enhance artifact recovery. The water-screening station incorporated a nested screen system in which a screen box with ¼-inch mesh was aligned over a ⅛-inch mesh screen box. Since the purpose of the ⅛-inch mesh was to capture rare but potentially diagnostic small items, the ⅛-inch sample residues were dried, examined, and saved but not subject to further analysis. The residue from the ¼-inch mesh was dried, sorted, and cataloged.

Specimen numbers were added at the end of the sample bag number indicating the different archaeological materials recovered in each sample. Archaeological materials collected and analyzed included bone, shell, botanicals, ceramic, glass, metal, milled wood, and architectural items such as brick and mortar (the full artifact catalog and analyses is in Appendix B). A brief summary of the archaeological materials recovered from each core was recorded on a Core Summary Log which included the borehole number, sample top and bottom depths, and material discarded (i.e., coal, charcoal, size and shape of rocks). Industrial waste and other manufacturing byproducts such as charcoal, coal, slag, and clinker were not collected at every occurrence due to the redundancy of collecting entire facies of industrial material previously noted during the core logging.

Chapter 4 Results

Eighteen boreholes, totaling 821 linear feet, were drilled in areas of ground disturbance at proposed column locations and in an area for a proposed retained fill and walls at the base of the Royal Brougham rail overcrossing loop. The final borehole sampling pattern was T-shaped within the project area (Figure 4-1) in which six boreholes (SC-1, -2, -4, -6, -13, and -16) comprised the west-to-east transect while the remaining boreholes extended south from borehole SC-6 to S. Atlantic Street to form the north-south transect. Total drilled depths varied from 40 to 50 feet below the modern surface (fbs), except for SC-15 which terminated at 12.5 fbs. Approximately 60 percent (or 495 linear feet) of the cores were archaeologically sampled for a total sample volume of 135 cubic feet. The portions of the cores that were not processed were sections characterized by thick, massive deposits of mud, deeper Holocene sediments deposited in a subtidal environmental setting, and the basal Pleistocene sediments. Illustrated core logs and detailed stratigraphic and descriptions of archaeological materials are in Appendices A and B. The cores were processed November 7-16, and December 4-6, 2007.

4.1 Facies and Stratigraphic Analysis

Deposits identified in the boreholes included sediments belonging to three facies assemblages representing, from top to bottom, the historic fill, Holocene sediments, and the upper portion of the basal Pleistocene sediments. The historic fill assemblage comprised simple sequences of undifferentiated fill facies resting atop clay and sand facies. The underlying Holocene facies assemblage was predominantly layers of silt and clay representing sedimentation in subtidal and intertidal depositional environments associated with the advance of the Duwamish River delta into Elliott Bay.

Three boreholes (SC-2, -13, and -16) encountered the top of Pleistocene sediments between 40 and 45 fbs. Since the Pleistocene assemblage includes glacial and non-glacial sediments dating to the Vashon and pre-Vashon glacial periods and so pre-date human occupation in North America, the Pleistocene lithostratigraphy is not discussed further in this report.

Holocene Assemblage

The Holocene sediments consist of six facies arranged as interbedded and graded sequences of silty and sandy clays (**C**), massive silt (**Zm**), sandy silt (**Zs**), silty sand (**S**z), silt (**Z**), and fine

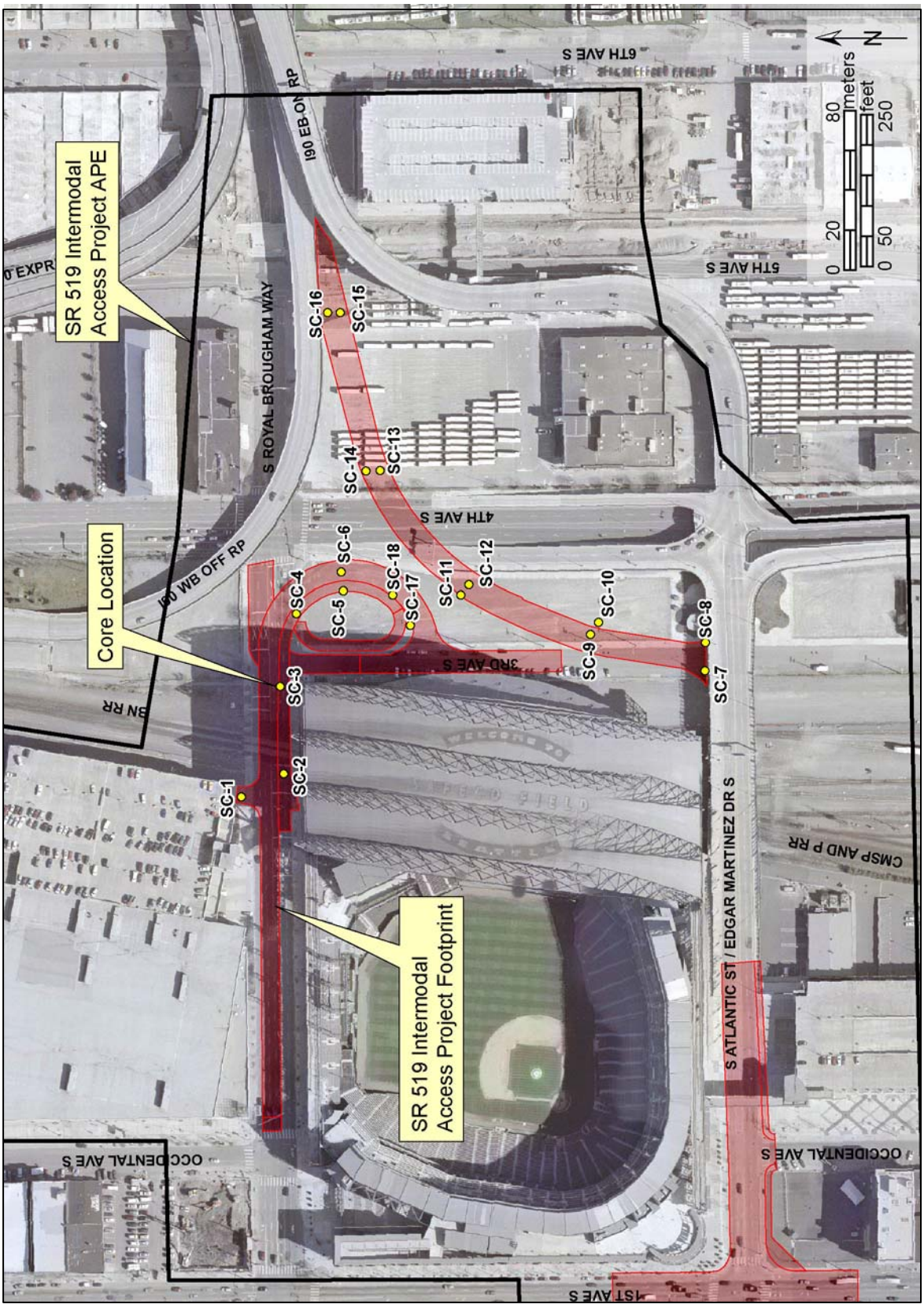

FIGURE 4-1. LOCATION OF CORES IN RELATION TO THE PROJECT AREA.

sand (**S**) (Figures 4-2 and 4-3). Though variable from hole to hole, the vertical sequences exhibited an overall coarsening-upward grain size trend. Generally, the lowermost portions of the Holocene assemblage were characterized by massive sandy clay, silty clay and silt layers overlain by coarsening-upward sequences consisting of a basal massive silt grading up through sandy silt and silty sand layers and finally capped by fine sand. Occasionally, the fine sand facies contained nodules (ranging in size up to 6 cm in diameter) of loosely consolidated silt or very fine sand or were interbedded with thin layers of peaty silt.

The general coarsening-upward trend in sediment grain size is a typical pattern of delta sedimentation and in this case represents vertical sediment accretion as the Duwamish River delta front advanced farther into Elliott Bay. As the delta advanced, older finer-grained sediments deposited in deeper waters in front of the delta were gradually buried under coarser-grained sediments as fluvio-deltaic sedimentation became more dominant when the delta top aggraded enough to emerge as the historic tideflats. The presence of sandy silt and clay-silt layers interbedded within the more coarse-grained deposits from the upper portions of the Holocene probably represent shifting small-scale depositional environments within the overall coarsening-upward trend. Thin layers of peat, consisting primarily of fine roots and rhizomes, are associated with these silt interbeds and indicate intermittent periods of relative landform stability which allowed for local vegetation growth. The fine alluvial sand deposited on top of the peat layers indicates the resurgence of higher-energy sediment transport conditions resulting in rapid burial of the peat-forming plant growth. The inclusions of silt and very fine sand in the well-sorted fine alluvial sandy matrix suggest rapid sediment transfer and burial in a fluvial environment, and may represent the downstream transport through tidal and delta distributary channels of eroded wetland sediments from higher up on the delta.

Historic Fill Assemblage

The historic fill is a well-defined facies assemblage present in all 18 cores. Seven facies types comprise the historic fill and were assigned to one of three facies groups: **Mass Deposits**, **Sedimentary Fill Layers**, and **Other**. Each facies type was assigned to a group based on the type of archaeological materials or sediments characterizing the facies (Table 4-1). Facies types belonging to the **Mass Deposits** group are of archaeological interest but are not typically expressed as traditional archaeological artifact or feature patterns.

The facies group called **Sedimentary Fill** includes lithofacies considered "clean" relative to the overall nature of the fill in the sense that the facies in this group tend to have little to no admixture of archaeological objects or matrix. In the present context these facies types may represent regrade or dredging spoils, or other hydraulic deposits; at greater depths, they may represent wave reworking during early stages in the accumulation of the fill.

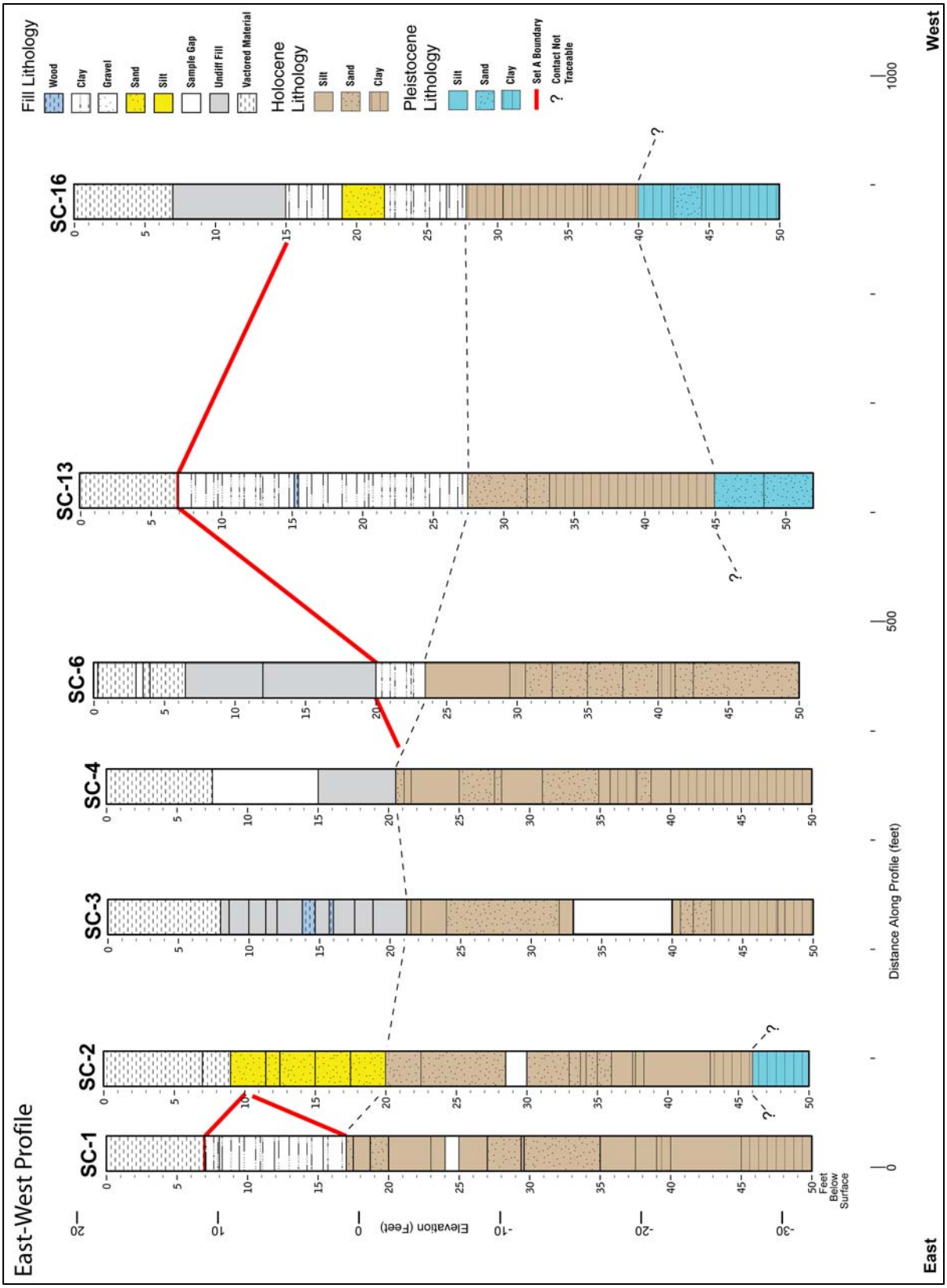

FIGURE 4-2. PROFILE OF CORE LOGS, EAST-WEST TRANSECT.

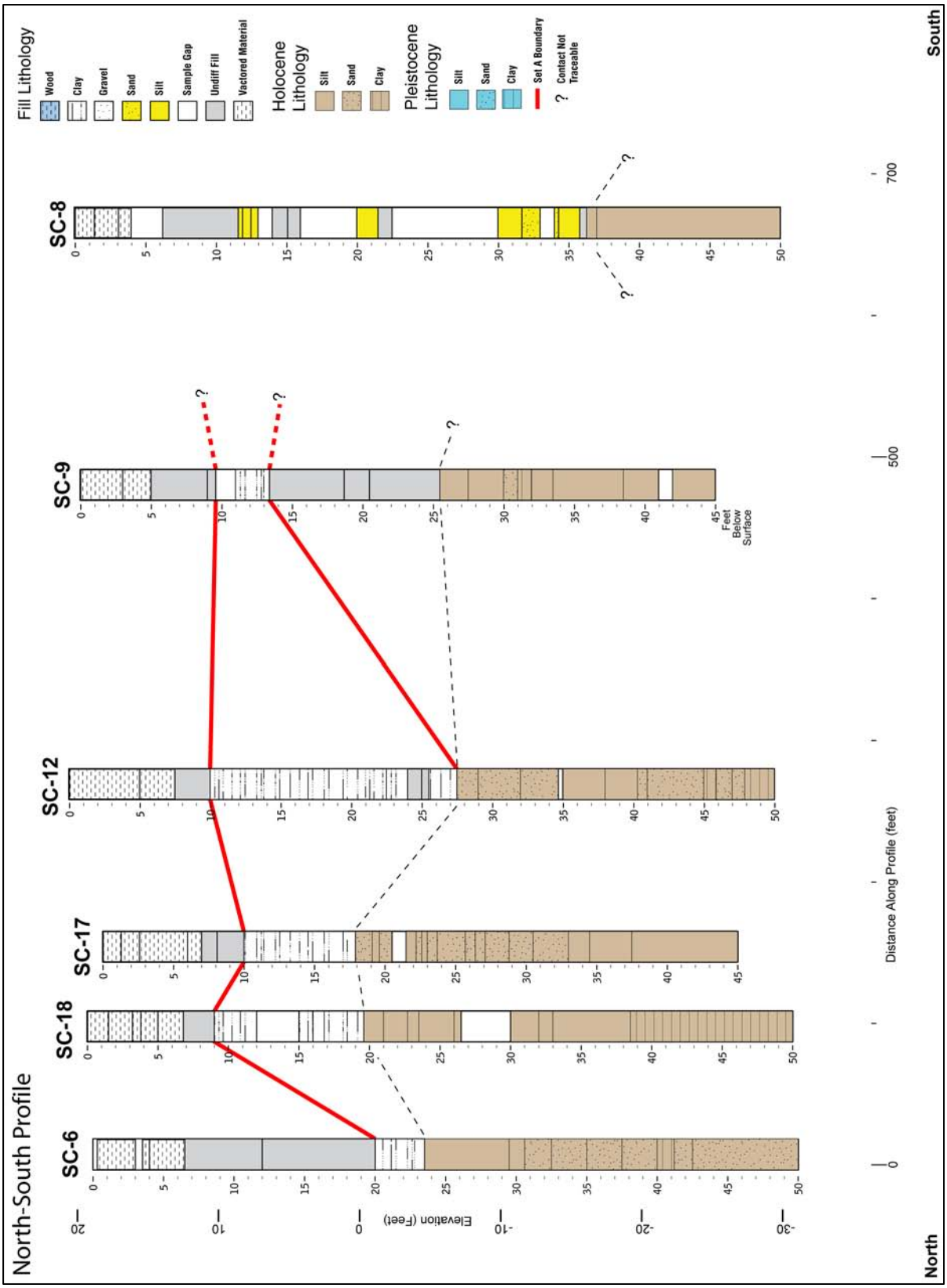

FIGURE 4-3. PROFILE OF CORE LOGS, NORTH-SOUTH TRANSECT.

TABLE 4-1. LITHOFACIES TYPES AND FACIES GROUPS IN THE HISTORIC FILL.

FACIES TYPE	FACIES DESCRIPTION	OCCURRENCE (SC-)	COMMENTS
Mass Deposits			
Wood	Unspecified wood debris, inclusive of both natural wood, and archaeological wood deposits lacking distinctive cultural properties. High degree of internal variability.	13	Rare; woody pulp layer.
Sedimentary Fill			
Sand	Varies significantly with location, usually consists of loose to slightly consolidated silty or clean sand. May be weakly bedded or contain nodules of silt or very fine sand. Occasionally contains dispersed wood debris or plant fibers, or industrial materials such as brick, concrete, or sawdust.	2, 8, 16	Other than a 10-foot-thick layer in SC-2, of rare occurrence.
Silt	Silt is the modal grain size. May contain wood debris, plant fibers or archaeological materials.	7, 8	Co-occurs with Clay to form a distinct laterally extensive mud stratum across project area.
Clay	Gray, massive and includes dispersed subrounded pebbles, rip-up clasts of varved clay, and low numbers of crushed shell.	All except 3 and 8.	With Undifferentiated Fill, is most common facies across the project. Co-occurs with Silt to form a laterally extensive bed across project area.
Other			
Undifferentiated Fill	Matrix-supported facies, usually sandy or silty with gravels; often somewhat consolidated. Generally a poorly sorted, disorganized matrix with scattered fragments of wood debris or other cultural material.	3, 5-12, 15-18	With Clay the most common facies across the project. Usually appears in the upper fill sequence, often at the top of the fill. Can be massive or stratified.
Vactored Fill	Chaotic, disorganized sediments, fragmented archaeological material such as brick, concrete; or modern roadbase material or refuse.	All	
Sample Gap	No recovery of sediments or material.	Only SC-13 and -15 had complete core recovery.	

The **Other** facies group includes three lithofacies types: Undifferentiated Fill, Vactored Fill, and Sample Gap. The lithofacies type Undifferentiated Fill lacks a dominant archaeological constituent and does not have distinctive properties allowing it to be assigned to one of the other lithofacies types. Undifferentiated Fill layers tend to be poorly sorted with fragments of brick, wood, and so on scattered throughout the matrix. The Vactored Fill lithofacies designates sediment or archaeological material vactored out of the upper seven feet of the borehole and then replaced in the hole before coring. Vactored Fill is not intact and does not retain its original stratigraphic order. The final category, Sample Gap, marks breaks in the core sequence where core sediment, for a variety of reasons, was not retrieved.

Sedimentary Fill Layers

Clay was the most prevalent lithofacies by volume. Sand was present in two cores, one at each end of the west-to-east alignment. In SC-2, 10 feet of sand between 9 and 20 fbs was bounded by Holocene deposits below and by 2 feet of the clay facies above. A two-foot-thick deposit of sand between 19 and 22 fbs in SC-16 was bounded top and bottom by clay.

The sedimentary fill layers contained few artifacts which were found as isolated single objects or small scatters of glass or brick fragments. Small amounts of glass, metal, and brick were collected from all three types of sedimentary fill in six cores (SC-1, -2, -7, -8,-10). A bullet retrieved from SC-2, and a clear glass flask base recovered from SC-7 were temporally diagnostic.

Vactored and Undifferentiated Fill

The undifferentiated fill facies matrix was fine-grained sediment (fine sand, silt, or clay) with inclusions of coarse sand, granules, pebbles, and small amounts of archaeological material. Undifferentiated fill facies were present in 15 cores, and varied in thicknesses from 1 to 15 feet. The undifferentiated fill was immediately overlain by vactored fill in fourteen cores, but in SC-11 it was overlain by clay deposits. Elevation of the Undifferentiated fill ranged from 15 feet above modern sea level (asl) to about 5 feet below modern sea level (bsl). In all of the cores where present, the undifferentiated material was directly underlain by either clay or Holocene deposits, but usually by clay.

Most of the artifacts and archaeological materials were recovered from the Vactored Fill. Vactored Fill was in the top 7 to 10 feet in all 18 cores (comprising about 15% of total drilled length). Vactored Fill designates sediment vactored from the top 7 feet of the borehole and then replaced in the hole before coring.

Wood

Wood was a very minor constituent of the historic fill and occurred as thin layers of fine woody debris or peat interbedded with undifferentiated fill layers in SC-3 and SC-13.

Lithostratigraphic Set A

A subset of the historic fill facies types were grouped into a more inclusive group or “set”, and the principle of formation is the same as the assemblage but at a smaller scale. The set is similar to a facies assemblage insofar as it represents deposits that share a similar lithology, distribution, and similar depositional environment, but serves the purpose of highlighting stratigraphic relationships at a smaller scale within the overall assemblage. Set A consists of fine-grained, mostly clay, lithofacies occurring in 13 cores, and varies from 5 to15 feet in thickness within a elevation range between 18 feet asl and 10 feet bsl (Figures 4-2 and 4-3).

4.2 Artifact Assemblage Characteristics

Archaeological materials were recovered from 16 boreholes (Table 4-2), and all materials were historic debris and refuse found in the historic fill above the former tideflat surface. Most of the material was recovered at shallow depths from the uppermost portions of the boreholes in the facies type undifferentiated fill. In general, the highest densities of materials were recovered from the boreholes along the north-to-south transect south of SC-6 (Figure 4-3; Table 4-2) in the block bordered by S. Royal Brougham Way to the north and S. Atlantic Street to the south, and bounded on the west and east by 3rd Ave S and 4th Ave S, respectively.

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TABLE 4-2. TOTAL ARTIFACT RECOVERY BY CORE AND MATERIAL TYPE. FOR COMPARATIVE PURPOSES, ARTIFACT COUNTS HAVE BEEN NORMALIZED TO DENSITY PER 1 CUBIC FOOT.

CORE	BOTAN-ICAL	BRICK	CER-AMIC	FAUNAL	GLASS	METAL	OTHER	TEX-TILE	WOOD	TOTAL DENSITY	TOTAL NO. OF TYPES
SC-1	-	-	-	36.9	3.3	-	-	-	8.4	48.6	3
SC-2	-	3.3	10.0	-	-	3.3	-	-	-	16.6	3
SC-3	-	-	-	11.7	-	-	-	-	-	11.7	1
SC-4	-	-	-	26.6	-	3.3	-	3.3	20.0	53.2	4
SC-5	-	-	-	9.7	-	6.0	104.5	-	6.0	126.2	4
SC-6	-	-	122.4	4.2	-	6.0	-	-	46.4	179.0	4
SC-7	3.0	12.0	-	-	6.0	-	-	-	6.0	27.0	4
SC-8	-	31.2	-	-	-	-	-	-	-	31.2	1
SC-9	-	-	3.0	-	84.5	-	-	-	-	87.5	2
SC-10	-	57.0	33.7	-	23.3	9.0	-	-	-	123.0	4
SC-11	14.1	33.3	120.0	-	223.2	14.1	-	-	3.0	407.7	6
SC-12	-	-	3.0	-	3.7	-	-	-	-	6.7	2
SC-13	3.3	-	-	10.0	8.3	60.0	-	-	16.7	98.3	5
SC-14	-	-	13.3	-	-	-	-	-	-	13.3	1
SC-15	-	-	-	-	-	-	-	-	-	0.0	0
SC-16	-	-	3.3	-	20.0	-	-	-	3.3	26.6	3
SC-17	-	-	-	-	65.7	-	-	-	-	65.7	1
SC-18	11.1	-	3.3	-	44.8	-	-	-	-	59.2	3
Totals	31.5	136.8	312.0	99.1	482.8	101.7	104.5	3.3	109.8	1381.5	
Distribu-tion	4	5	9	6	10	7	1	1	8		

All archaeological materials recovered in the historic fill were classified according to material type. Nine classes of materials were identified in the artifact assemblage: Botanical, Brick, Ceramic, Faunal, Glass, Metal, Textile, Wood, and Other (Table 4-2). Discrete objects classified as Botanical include fruit pits, seeds, and nut shells. Faunal specimens include bird, fish, and mammal bone. Metal includes nails and other metallic items (such as clothing closures and tin

can fragments). Materials classified as Ceramic include dishes, cups, and other tablewares, terra cotta pipe (for plumbing), and concrete. The Glass and Leather classes require no subdivisions. Table 4-2 presents the amount of artifact recovery (normalized to a standard volume of one cubic foot) and the distribution of the material types among the cores.

Description

Botanical

Seven seeds/shells were recovered from four cores. Of these, three were identifiable parts of an acorn (or filbert) shell and a pumpkin seed (Figure 4-4, Catalog #13). The remaining were shell fragments.

Brick

Brick fragments occurred in low quantities and in small fragments in five cores. Some of them had mortar still attached, and one fragment had the remnants of eggshell paint.

Ceramic

Ceramic materials were recovered from nine boreholes. Ceramic artifacts included fragments of terra cotta pipe, unglazed earthenware, tile fragments (one with white glaze and the other with light green decoration), and a sherd with a white base color, decorated with grey and black speckles and a teal stripe. None of these are diagnostic.

Faunal

The faunal remains, recovered from five cores, included a bird vertebrae (Figure 4-4, Cat #95), two deer femurs, a deer calcaneous, salmon bones, charred mammal bone, and a crustacean claw (Appendix B). Shell was numerous and occurred naturally throughout the sediments. Species identified include clam, barnacles, limpets, nucella, mussels, moon snail, and cockles.

None of the bone recovered was human.

Glass

Glass was found in eight boreholes and came from window glass, a bottle made using the automatic or semi-automatic bottle process, and several shards from bottles made using undeterminable processes. In addition to the shards, the base of a flask made using the two-part bottle mold was found (Figure 4-4, Cat #33-1). This bottle manufacturing technique dates from the 1850s through the 1920s (Miller et al. 1989:28). There were also several shards that may have come from glass blocks – one side of each of the thick, flat glass fragments was painted black and was too thick to be window glass. One piece of pressed glass (spanning the time period from the 1860s through the 20th century) was found. Pressed glass is manufactured by

FIGURE 4-4. SELECTED ARTIFACTS RECOVERED FROM CORES.

dropping hot glass into a mold, and using a plunger to force the hot glass into conformity with the mold. The glass takes the form of the mold on its exterior surface, while the interior surface remains smooth from having been shaped by the plunger (Jones and Sullivan 1989:33). The pressed glass was found at 11 fbs in SC-6.

Metal

Metal was recovered from six boreholes, and includes a bullet, nails, a railroad spike, and scrap. The nails were both cut and wire, and the scrap metal appeared to be from welding. The bullet (Cat #267-1) was recovered from SC-2 at 18 fbs (Figure 4-4). There was also a flat cast-iron piece (SC-4, Cat #254-1) that had been punched through by the core barrel (Figure 4-4). This piece has a hinge, indicating it could have been a door to a large piece of machinery or industrial item.

Wood

Wood was found in eight boreholes. All the wood recovered, except for a single piece of bamboo, was milled, and included a 1x2 piece of lumber, lath, beveled molding, and shavings.

Other

Other remains included newspaper, felt, fabric, rubber, and a bullet (Figure 4-4, Cat #267-1). The newspaper was recovered in small fragments, and the legible text did not provide a date.

Distribution Patterns

Overall artifact densities were low throughout the project area but four material types were relatively well-represented among the cores. Glass and ceramic were the artifact categories with the most representation among the cores. Glass was found in 10 cores, while ceramics were found in nine. Next in abundance was Wood, found in 8 cores, and Metal, recovered from 7 cores. Except for SC-11, the number of types recovered from each core was relatively low, indicating little obvious localized diversity in the assemblage.

A closer examination of the artifact distribution relative to the stratigraphic sequence shows distinct variation in artifact densities above, within, and below Set A (Table 4-3). The majority of artifacts and archaeological materials, including brick, glass, metal, and all of the ceramics, were recovered from the vactored deposits, and total artifact density in the historic fill above Set A was just under 740 items per cubic foot. For example, SC-11 had relatively high counts of brick, glass, ceramic, and metal; SC-10 had high counts of brick; and SC's 9 and 17 had fairly high counts of glass. All of these cores are close to the east end of Qwest Field, which was constructed at the location of the former Kingdome. Since the Kingdome itself was built on the site of several former historic structures (Appendix C: 1950 Sanborn Map), the artifacts in the

TABLE 4-3. SUMMARY OF ARTIFACT RECOVERY AND NUMBERS OF DIFFERENT ARTIFACT TYPES.

BORE	VACTORED FILL		WITHIN SET A		BELOW SET A	
	ARTIFACT DENSITY[A]	TOTAL NO. OF TYPES	ARTIFACT DENSITY	TOTAL NO. OF TYPES	ARTIFACT DENSITY	TOTAL NO. OF TYPES
SC-1	48.6	3	42.0	2	-	-
SC-2	16.5	3	-	-	16.6	3
SC-3	11.7	1	-	-	-	-
SC-4	23.2	3	3.3	1	-	-
SC-5	120.2	4	-	-	120.2	4
SC-6	50.5	2	50.6	3	-	-
SC-7	27.0	4	-	-	6.0	1
SC-8	31.2	1	-	-	-	-
SC-9	3.0	1	-	-	3.0	1
SC-10	89.3	3	8.3	1	-	-
SC-11	166.3	5	-	-	154.4	5
SC-12	3.7	1	-	-	-	-
SC-13	98.0	5	10.0	2	-	-
SC-14	13.3	1	13.3	1	-	-
SC-15	-	-	-	-	-	-
SC-16	26.5	3	3.3	1	-	-
SC-17	-	-	-	-	-	-
SC-18	11.1	1	-	-	-	-
Totals	740.1	-	34.9	-	300.2	-

[a] Artifact densities are normalized to standard volume of 1 cubic foot.

top seven feet of these four cores could represent at least two episodes of building demolition, surface reworking, and new construction.

Within Set A there was a twenty-fold drop in artifact density relative to the vactored fill to just under 35 items per cubic foot (Table 4-3); this decrease is also associated with a low diversity of material types within any single core.

On the other hand, the portion of the historic fill between Set A and the basal contact with the former tideflats surface shows a notable increase in artifact density to about 300 items per cubic foot, an amount that is approximately one-half of the recovery from the upper portion of the cores above Set A. Most of this increase in density is accounted for by SC-5 and SC-11; in addition, the diversity of material types for these two cores also increases with the increase in density.

Chronology

The two chronologically sensitive artifacts were characterized by dates of manufacture spanning relatively long time spans (Table 4-4). The sandy depositional context and the estimated post-1930s age range for the bullet (Catalog # 267-1) found at about 10 fbs in SC-2 is consistent with the final stages of tideflat filling. The bottle base (Catalog #33-1) was found in massive mud at

TABLE 4-4. TEMPORALLY SENSITIVE ARTIFACTS.

BORE	BAG/SPECIMEN	DEPTH/FACIES	ARTIFACT DESCRIPTION	DATE RANGE	SOURCE
SC-2	267-1	10-11.1 fbs/Sand	Bullet	post-1930s	Carl Carlson-Drexler, personal communication
SC-7	33-1	18 fbs/Silt	Flasked base- molded bottle	c.1850-mid 1920s	Jones and Sullivan 1989

18 fbs in SC-7 and its manufacturing dates, ranging between the 1860s and the 1920s, are consistent with the period of most active filling on the tideflats.

Discussion

By the mid-1890s, material from the various regrade projects and dredge spoils from construction of the Duwamish East and West Waterways was being used to fill the tide flats along First Avenue South. By 1899, the area of South Royal Brougham Way (historically Connecticut Street) and west of Third Avenue South was filled and a fill platform had been constructed where Moran Shipyard built steamers for the Yukon Gold Rush (Figures 4-5 and 4-6). Fill also extended as far as the current intersection of First Avenue South and South Atlantic Street.

The southward advance of 1st Avenue South across the tideflats had the same effect on the hydrology and geomorphology of the tideflats that a naturally occurring prograding spit has along natural shorelines. The artificial spit was a barrier that sheltered the tideflat from wave and tidal energy, and in essence, created a lagoonal-type settling basin where fine sand, silt, and clay comprising the lithostratigraphic Set A was trapped rather than being transported off the intertidal zone into deeper water.

The archaeological materials recovered in the lower portions of the historic fill below Set A represent sporadic deposition before 1st Avenue S had advanced far enough to effectively block the tideflats. Though sample sizes are small, the relatively high artifact density and the higher numbers of artifact types found in SC-5 and SC-11 are archaeologically interesting in this respect because the area of these two boreholes may represent primary discard locations during an early period when unregulated sporadic dumping was common. The overlying Set A, from which few artifacts were recovered, probably accumulated relatively rapidly and is a good example of indirect environmental effects caused by human land use elsewhere in the landscape.

First Avenue South was initially a planked roadway extending from Denny Island. By 1916 there were railroads built on trestles along Fifth Avenue South and between Third Avenue South and Occidental Avenue South. The areas north and south of South Royal Brougham Way and west of Third Avenue South were home to tracks and buildings of the Great Northern Railway,

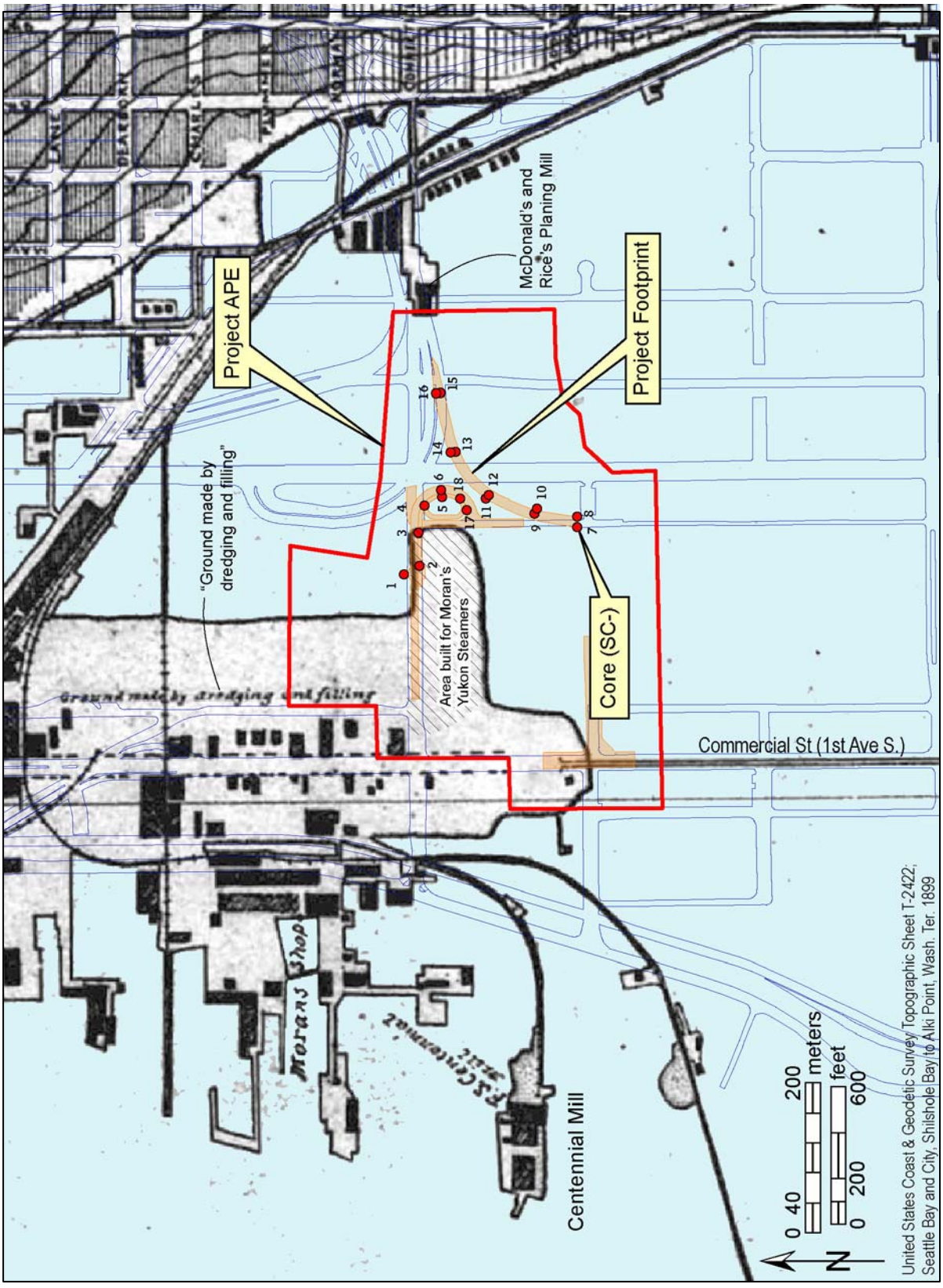

FIGURE 4-5. MAP SHOWING THE PROGRESSION OF THE FILLING OF THE TIDE FLATS IN THE PROJECT VICINITY, 1899

FIGURE 4-6. OVERVIEW OF THE TIDE FLATS, 1898, SHOWING CONDITIONS IN THE PROJECT VICINITY.

and the southwest corner of First Avenue South and South Atlantic Street was the location of the Chicago, Milwaukee and St. Paul Railway tracks and freight depot. The shanties and houses that had been built in the area around 1904 were gone by 1916, but First Avenue South still hosted industrial and commercial enterprises, such as junk businesses, machine shops, storage warehouses, and Gray Brothers carriage and wagon parts.

The 1916 Sanborn Fire Insurance Map of the block west of 4th Ave South (Appendix C) shows no buildings or structures had been built in the block by that time, and 4th Ave South was elevated on a trestle about 27 feet above a remnant area of shallow open tideflat. By as late as 1950, after the tideflat in this area was filled, there were still only a few commercial establishments, such as a grocery (SC- 5 and -6), a cold storage warehouse (just north of SC-17 and -18) and a restaurant (east of SC-9 and -10), occupying the block. The bulk of the historical archaeological materials were found in the upper 10 feet of the historic fill overlying Set A and the relative highest densities of artifacts occur in the upper 3 to 10 fbs in the vicinity of former buildings and structures. These artifacts presumably represent reworking and demolition material from razing of the buildings, as well as demolition from razing the Kingdome.

Chapter 5 Recommendations

1) The coring locations in the areas of Boreholes SC-5 and SC-11 should be archaeologically monitored between 16 and 25 fbs, and means provided for the onsite archaeologist to recover any data related to archaeological resources. The excavated spoils should be kept separated from the other shaft spoils;

2) Excavations for the proposed signal pole and catch basin at the southeast corner of 1st Ave S and South Atlantic Street would extend into the upper historic fill in an area noted in the Cultural Resources Discipline Report (Hudson et al. 2007) to have contained a number of shanties near the area of Shacktown. Materials from backhoe trenching to install the catch basin and from augering for the signal pole should be investigated to recover any archaeological data and;

3) An Unanticipated Discovery Plan (UDP) should be drawn up and made available to construction personnel onsite. The plan would include a list of contacts and protocols to follow in the event archaeological materials, human remains, or mortuary goods are unearthed during implementation of the project.

Chapter 6 References

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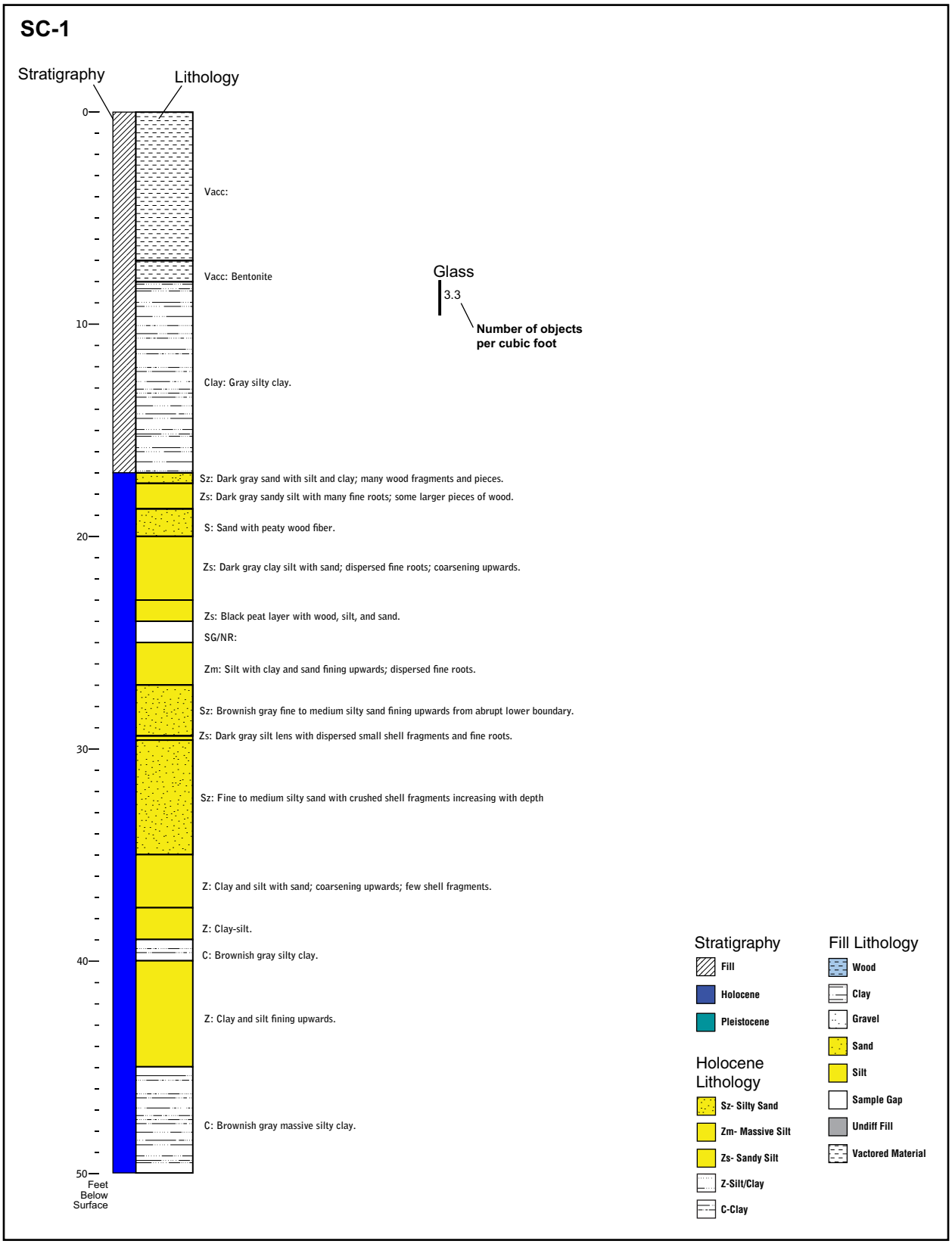
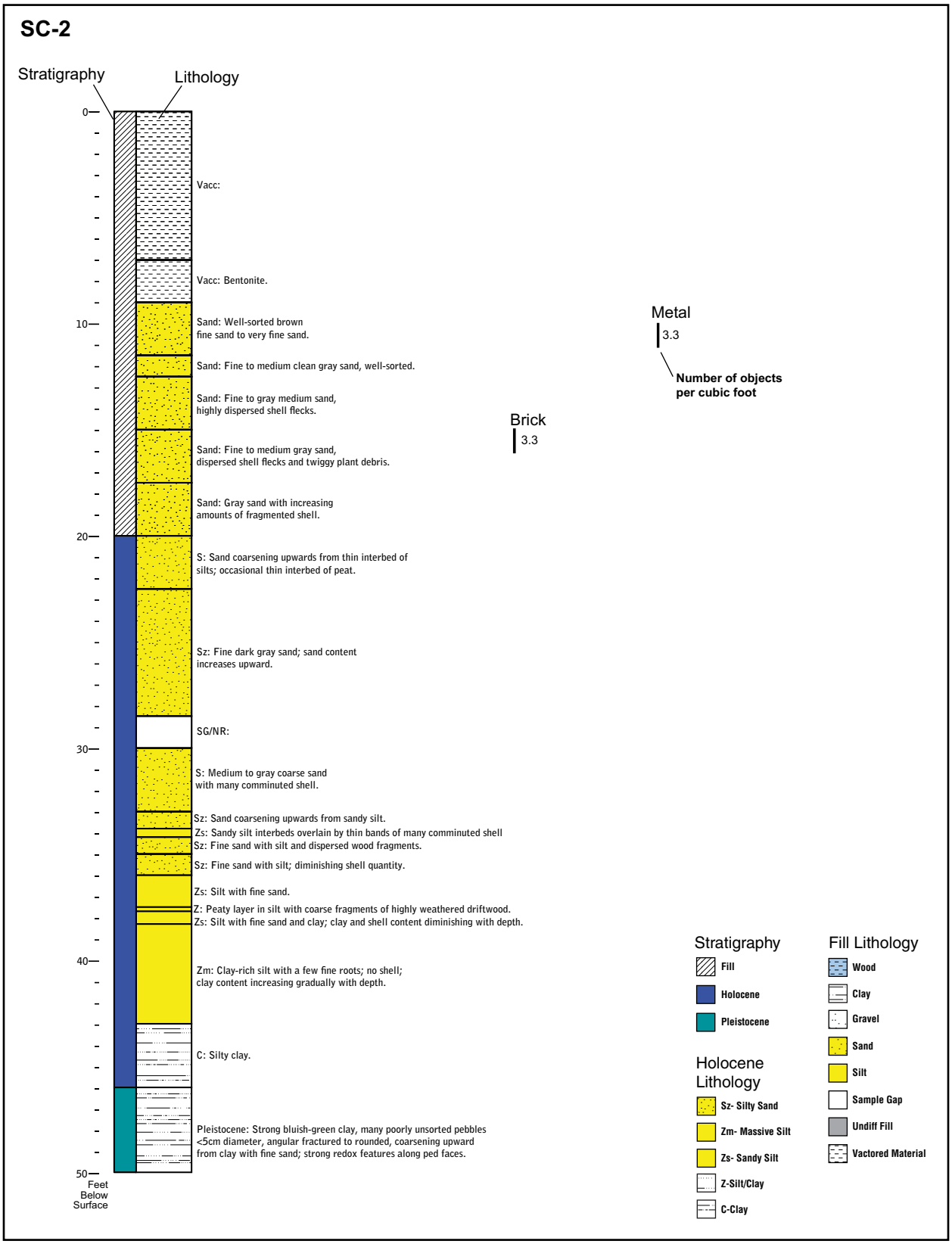
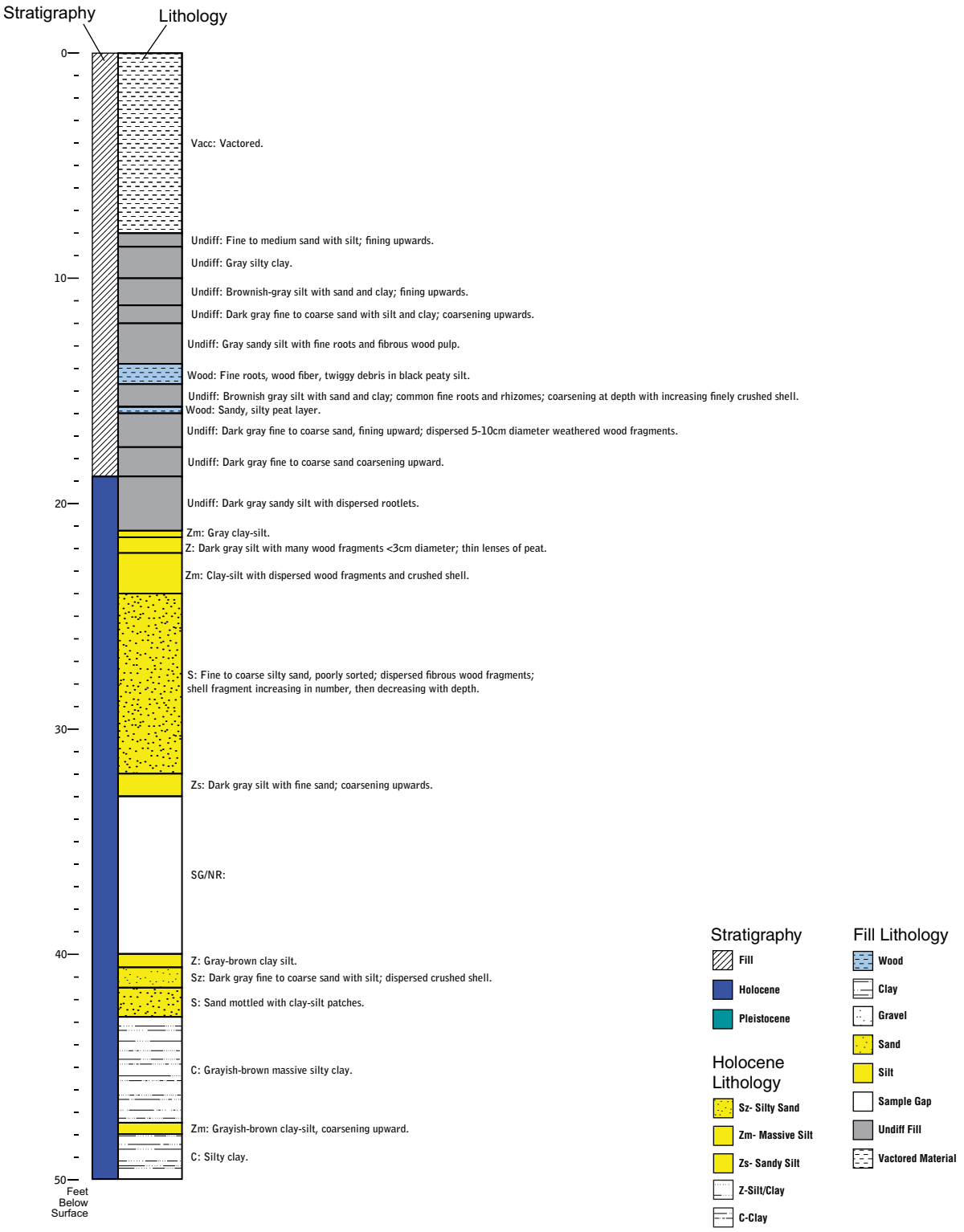
APPENDIX A: Core Logs

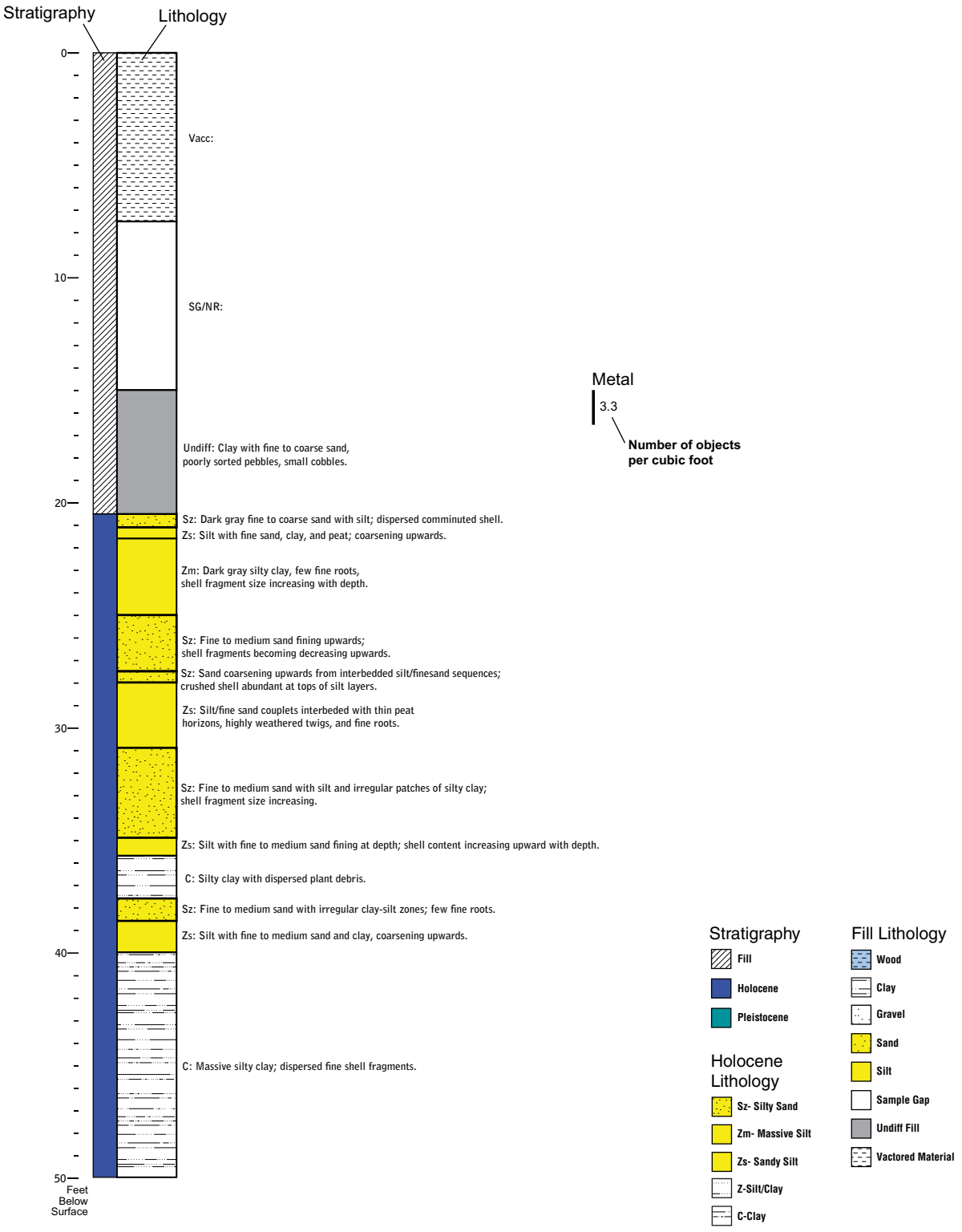

SC-1
Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc:
Vacc: Bentonite
Clay: Gray silty clay.
Sz: Dark gray sand with silt and clay; many wood fragments and pieces.
Zs: Dark gray sandy silt with many fine roots; some larger pieces of wood.
S: Sand with peaty wood fiber.
Zs: Dark gray clay silt with sand; dispersed fine roots; coarsening upwards.
Zs: Black peat layer with wood, silt, and sand.
SG/NR:
Zm: Silt with clay and sand fining upwards; dispersed fine roots.
Sz: Brownish gray fine to medium silty sand fining upwards from abrupt lower boundary.
Zs: Dark gray silt lens with dispersed small shell fragments and fine roots.
Sz: Fine to medium silty sand with crushed shell fragments increasing with depth
Z: Clay and silt with sand; coarsening upwards; few shell fragments.
Z: Clay-silt.
C: Brownish gray silty clay.
Z: Clay and silt fining upwards.
C: Brownish gray massive silty clay.
Glass
3.3
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material


SC-2
Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc:
Vacc: Bentonite.
Sand: Well-sorted brown fine sand to very fine sand.
Sand: Fine to medium clean gray sand, well-sorted.
Sand: Fine to gray medium sand, highly dispersed shell flecks.
Sand: Fine to medium gray sand, dispersed shell flecks and twiggy plant debris.
Sand: Gray sand with increasing amounts of fragmented shell.
S: Sand coarsening upwards from thin interbed of silts; occasional thin interbed of peat.
Sz: Fine dark gray sand; sand content increases upward.
SG/NR:
S: Medium to gray coarse sand with many comminuted shell.
Sz: Sand coarsening upwards from sandy silt.
Zs: Sandy silt interbeds overlain by thin bands of many comminuted shell
Sz: Fine sand with silt and dispersed wood fragments.
Sz: Fine sand with silt; diminishing shell quantity.
Zs: Silt with fine sand.
Z: Peaty layer in silt with coarse fragments of highly weathered driftwood.
Zs: Silt with fine sand and clay; clay and shell content diminishing with depth.
Zm: Clay-rich silt with a few fine roots; no shell; clay content increasing gradually with depth.
C: Silty clay.
Pleistocene: Strong bluish-green clay, many poorly unsorted pebbles <5cm diameter, angular fractured to rounded, coarsening upward from clay with fine sand; strong redox features along ped faces.
Metal
3.3
Number of objects per cubic foot
Brick
3.3
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

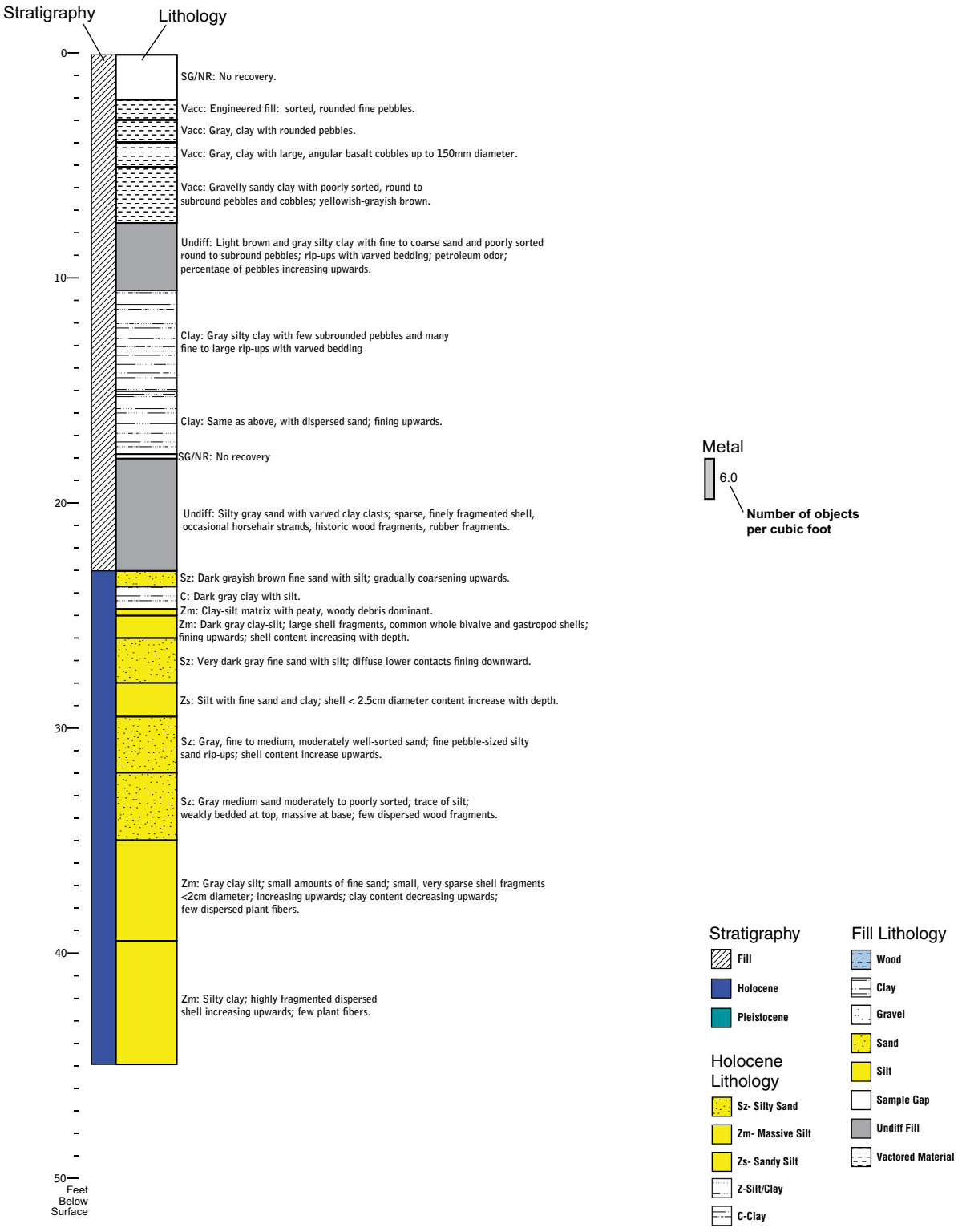
SC-3


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Vactored.
Undiff: Fine to medium sand with silt; fining upwards.
Undiff: Gray silty clay.
Undiff: Brownish-gray silt with sand and clay; fining upwards.
Undiff: Dark gray fine to coarse sand with silt and clay; coarsening upwards.
Undiff: Gray sandy silt with fine roots and fibrous wood pulp.
Wood: Fine roots, wood fiber, twiggy debris in black peaty silt.
Undiff: Brownish gray silt with sand and clay; common fine roots and rhizomes; coarsening at depth with increasing finely crushed shell.
Wood: Sandy, silty peat layer.
Undiff: Dark gray fine to coarse sand, fining upward; dispersed 5-10cm diameter weathered wood fragments.
Undiff: Dark gray fine to coarse sand coarsening upward.
Undiff: Dark gray sandy silt with dispersed rootlets.
Zm: Gray clay-silt.
Z: Dark gray silt with many wood fragments <3cm diameter; thin lenses of peat.
Zm: Clay-silt with dispersed wood fragments and crushed shell.
S: Fine to coarse silty sand, poorly sorted; dispersed fibrous wood fragments; shell fragment increasing in number, then decreasing with depth.
Zs: Dark gray silt with fine sand; coarsening upwards.
SG/NR:
Z: Gray-brown clay silt.
Sz: Dark gray fine to coarse sand with silt; dispersed crushed shell.
S: Sand mottled with clay-silt patches.
C: Grayish-brown massive silty clay.
Zm: Grayish-brown clay-silt, coarsening upward.
C: Silty clay.
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

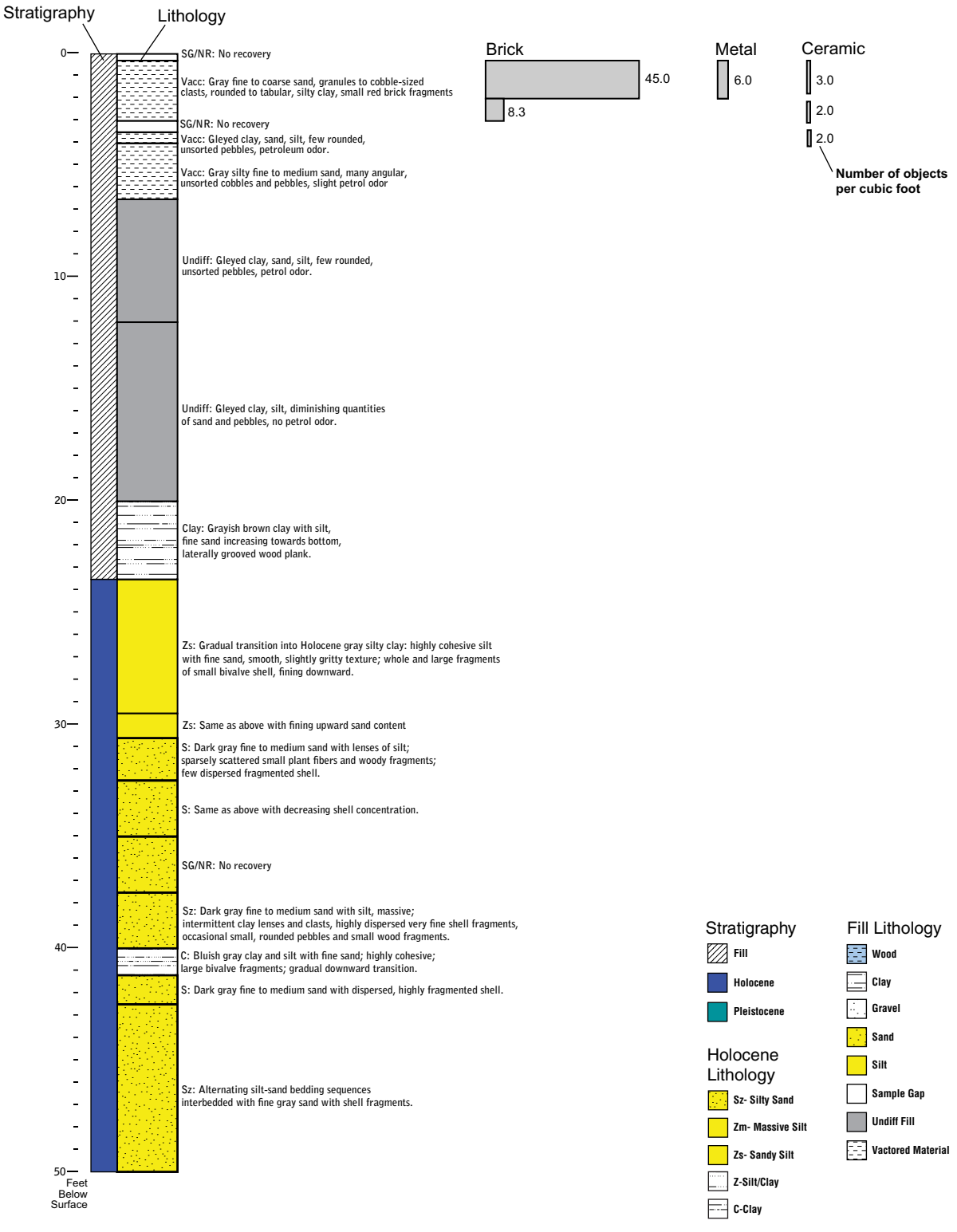
SC-4


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc:
SG/NR:
Undiff: Clay with fine to coarse sand, poorly sorted pebbles, small cobbles.
Sz: Dark gray fine to coarse sand with silt; dispersed comminuted shell.
Zs: Silt with fine sand, clay, and peat; coarsening upwards.
Zm: Dark gray silty clay, few fine roots, shell fragment size increasing with depth.
Sz: Fine to medium sand fining upwards; shell fragments becoming decreasing upwards.
Sz: Sand coarsening upwards from interbedded silt/finesand sequences; crushed shell abundant at tops of silt layers.
Zs: Silt/fine sand couplets interbeded with thin peat horizons, highly weathered twigs, and fine roots.
Sz: Fine to medium sand with silt and irregular patches of silty clay; shell fragment size increasing.
Zs: Silt with fine to medium sand fining at depth; shell content increasing upward with depth.
C: Silty clay with dispersed plant debris.
Sz: Fine to medium sand with irregular clay-silt zones; few fine roots.
Zs: Silt with fine to medium sand and clay, coarsening upwards.
C: Massive silty clay; dispersed fine shell fragments.
Metal
3.3
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

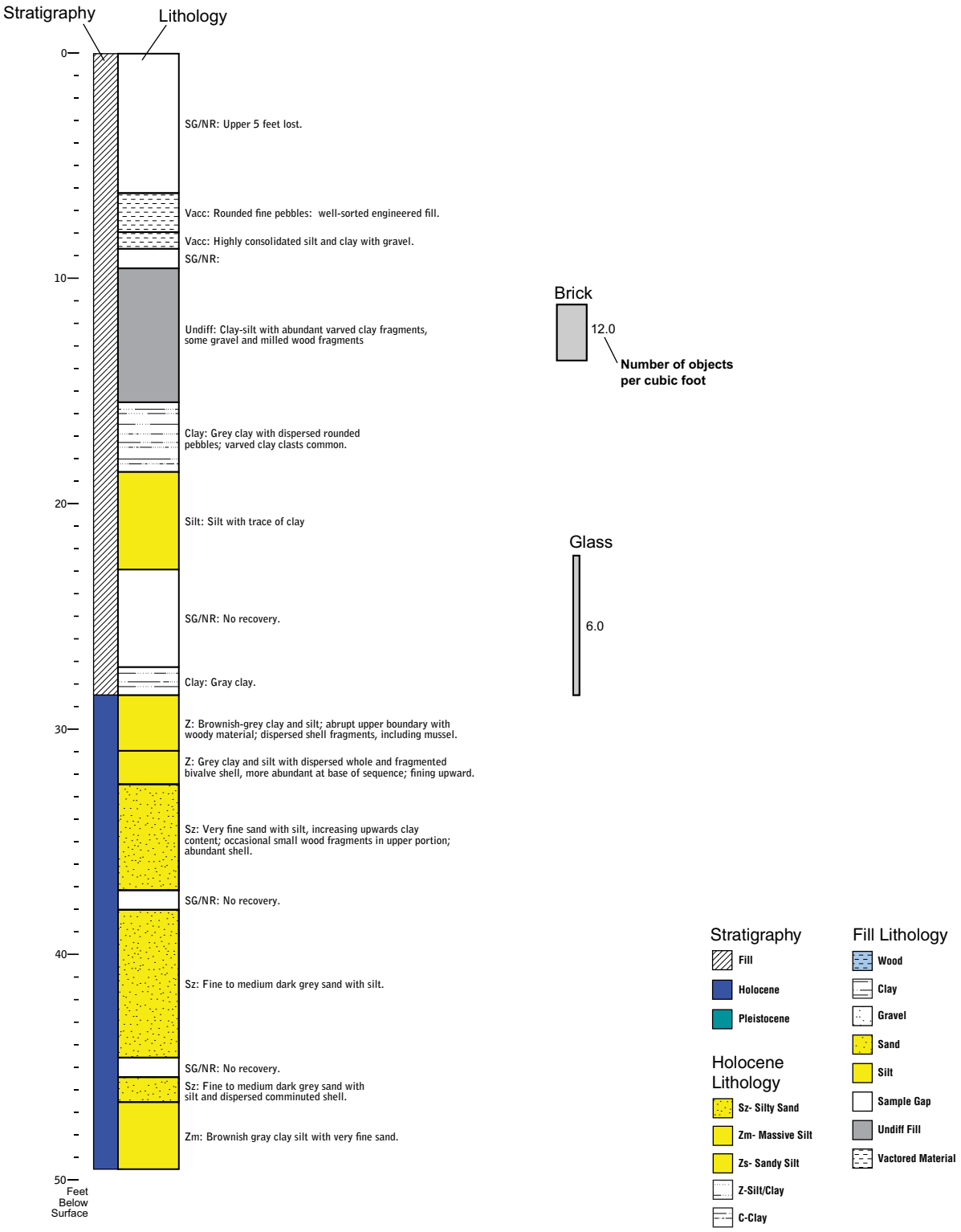
SC-5

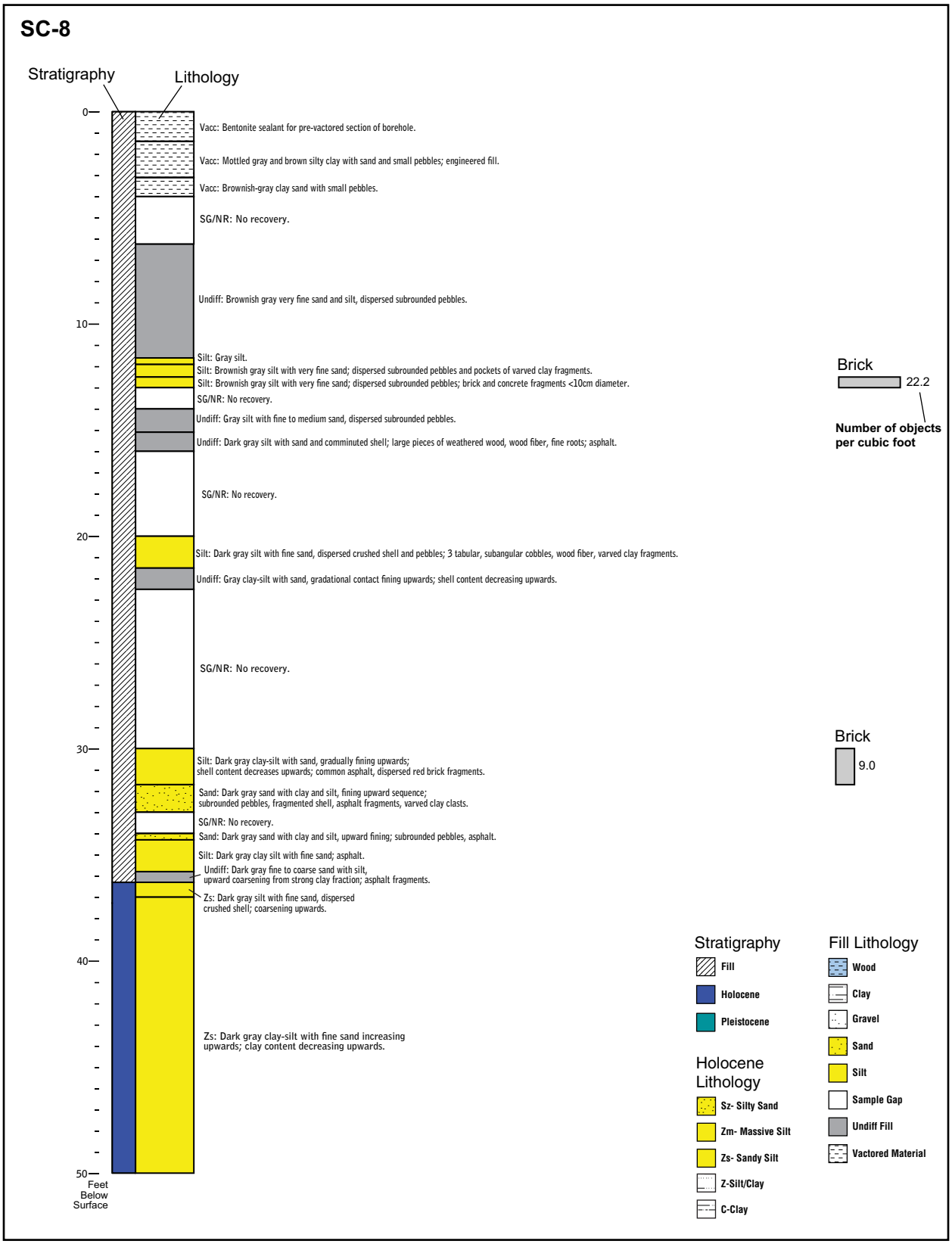

Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
SG/NR: No recovery.
Vacc: Engineered fill: sorted, rounded fine pebbles.
Vacc: Gray, clay with rounded pebbles.
Vacc: Gray, clay with large, angular basalt cobbles up to 150mm diameter.
Vacc: Gravelly sandy clay with poorly sorted, round to subround pebbles and cobbles; yellowish-grayish brown.
Undiff: Light brown and gray silty clay with fine to coarse sand and poorly sorted round to subround pebbles; rip-ups with varved bedding; petroleum odor; percentage of pebbles increasing upwards.
Clay: Gray silty clay with few subrounded pebbles and many fine to large rip-ups with varved bedding
Clay: Same as above, with dispersed sand; fining upwards.
SG/NR: No recovery
Undiff: Silty gray sand with varved clay clasts; sparse, finely fragmented shell, occasional horsehair strands, historic wood fragments, rubber fragments.
Sz: Dark grayish brown fine sand with silt; gradually coarsening upwards.
C: Dark gray clay with silt.
Zm: Clay-silt matrix with peaty, woody debris dominant.
Zm: Dark gray clay-silt; large shell fragments, common whole bivalve and gastropod shells; fining upwards; shell content increasing with depth.
Sz: Very dark gray fine sand with silt; diffuse lower contacts fining downward.
Zs: Silt with fine sand and clay; shell < 2.5cm diameter content increase with depth.
Sz: Gray, fine to medium, moderately well-sorted sand; fine pebble-sized silty sand rip-ups; shell content increase upwards.
Sz: Gray medium sand moderately to poorly sorted; trace of silt; weakly bedded at top, massive at base; few dispersed wood fragments.
Zm: Gray clay silt; small amounts of fine sand; small, very sparse shell fragments <2cm diameter; increasing upwards; clay content decreasing upwards; few dispersed plant fibers.
Zm: Silty clay; highly fragmented dispersed shell increasing upwards; few plant fibers.
Metal
6.0
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

SC-6

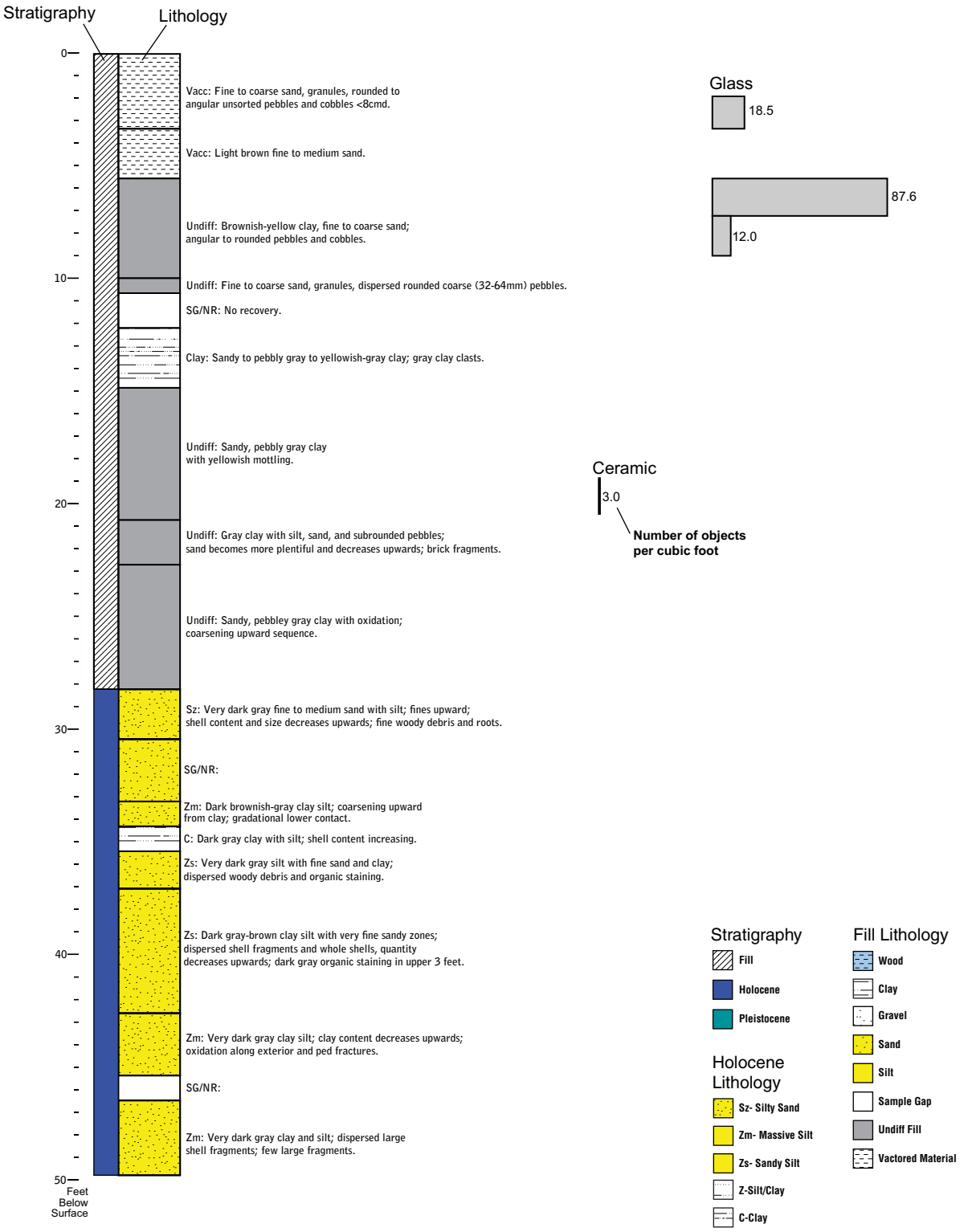

Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
SG/NR: No recovery
Vacc: Gray fine to coarse sand, granules to cobble-sized clasts, rounded to tabular, silty clay, small red brick fragments
SG/NR: No recovery
Vacc: Gleyed clay, sand, silt, few rounded, unsorted pebbles, petroleum odor.
Vacc: Gray silty fine to medium sand, many angular, unsorted cobbles and pebbles, slight petrol odor
Undiff: Gleyed clay, sand, silt, few rounded, unsorted pebbles, petrol odor.
Undiff: Gleyed clay, silt, diminishing quantities of sand and pebbles, no petrol odor.
Clay: Grayish brown clay with silt, fine sand increasing towards bottom, laterally grooved wood plank.
Zs: Gradual transition into Holocene gray silty clay: highly cohesive silt with fine sand, smooth, slightly gritty texture; whole and large fragments of small bivalve shell, fining downward.
Zs: Same as above with fining upward sand content
S: Dark gray fine to medium sand with lenses of silt; sparsely scattered small plant fibers and woody fragments; few dispersed fragmented shell.
S: Same as above with decreasing shell concentration.
SG/NR: No recovery
Sz: Dark gray fine to medium sand with silt, massive; intermittent clay lenses and clasts, highly dispersed very fine shell fragments, occasional small, rounded pebbles and small wood fragments.
C: Bluish gray clay and silt with fine sand; highly cohesive; large bivalve fragments; gradual downward transition.
S: Dark gray fine to medium sand with dispersed, highly fragmented shell.
Sz: Alternating silt-sand bedding sequences interbedded with fine gray sand with shell fragments.
Brick
45.0
8.3
Metal
6.0
Ceramic
3.0
2.0
2.0
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

SC-7

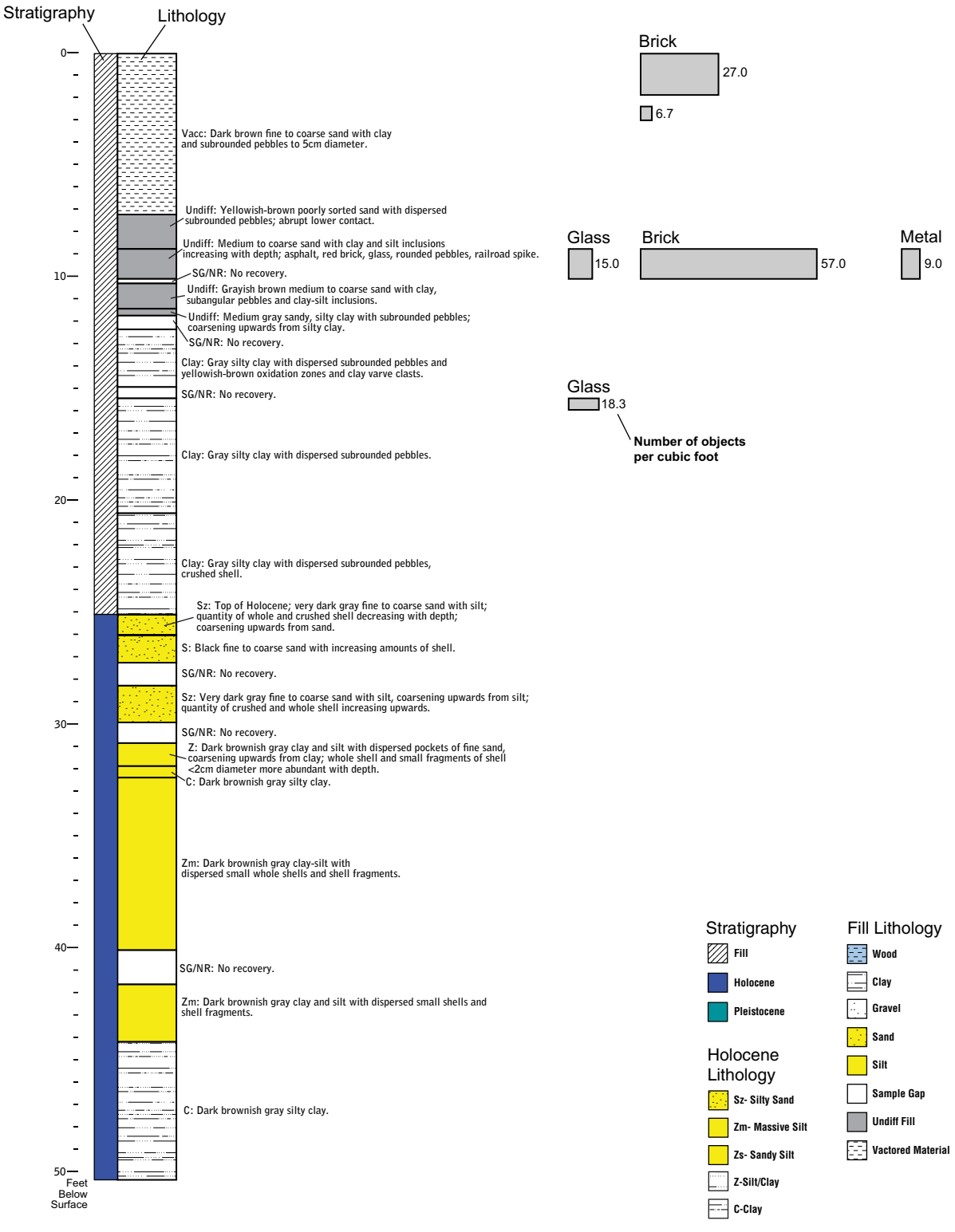

Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
SG/NR: Upper 5 feet lost.
Vacc: Rounded fine pebbles: well-sorted engineered fill.
Vacc: Highly consolidated silt and clay with gravel.
SG/NR:
Undiff: Clay-silt with abundant varved clay fragments, some gravel and milled wood fragments
Clay: Grey clay with dispersed rounded pebbles; varved clay clasts common.
Silt: Silt with trace of clay
SG/NR: No recovery.
Clay: Gray clay.
Z: Brownish-grey clay and silt; abrupt upper boundary with woody material; dispersed shell fragments, including mussel.
Z: Grey clay and silt with dispersed whole and fragmented bivalve shell, more abundant at base of sequence; fining upward.
Sz: Very fine sand with silt, increasing upwards clay content; occasional small wood fragments in upper portion; abundant shell.
SG/NR: No recovery.
Sz: Fine to medium dark grey sand with silt.
SG/NR: No recovery.
Sz: Fine to medium dark grey sand with silt and dispersed comminuted shell.
Zm: Brownish gray clay silt with very fine sand.
Brick
12.0
Number of objects per cubic foot
Glass
6.0
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material


SC-8
Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Bentonite sealant for pre-vactored section of borehole.
Vacc: Mottled gray and brown silty clay with sand and small pebbles; engineered fill.
Vacc: Brownish-gray clay sand with small pebbles.
SG/NR: No recovery.
Undiff: Brownish gray very fine sand and silt, dispersed subrounded pebbles.
Silt: Gray silt.
Silt: Brownish gray silt with very fine sand; dispersed subrounded pebbles and pockets of varved clay fragments.
Silt: Brownish gray silt with very fine sand; dispersed subrounded pebbles; brick and concrete fragments <10cm diameter.
SG/NR: No recovery.
Undiff: Gray silt with fine to medium sand, dispersed subrounded pebbles.
Undiff: Dark gray silt with sand and comminuted shell; large pieces of weathered wood, wood fiber, fine roots; asphalt.
SG/NR: No recovery.
Silt: Dark gray silt with fine sand, dispersed crushed shell and pebbles; 3 tabular, subangular cobbles, wood fiber, varved clay fragments.
Undiff: Gray clay-silt with sand, gradational contact fining upwards; shell content decreasing upwards.
SG/NR: No recovery.
Silt: Dark gray clay-silt with sand, gradually fining upwards; shell content decreases upwards; common asphalt, dispersed red brick fragments.
Sand: Dark gray sand with clay and silt, fining upward sequence; subrounded pebbles, fragmented shell, asphalt fragments, varved clay clasts.
SG/NR: No recovery.
Sand: Dark gray sand with clay and silt, upward fining; subrounded pebbles, asphalt.
Silt: Dark gray clay silt with fine sand; asphalt.
Undiff: Dark gray fine to coarse sand with silt, upward coarsening from strong clay fraction; asphalt fragments.
Zs: Dark gray silt with fine sand, dispersed crushed shell; coarsening upwards.
Zs: Dark gray clay-silt with fine sand increasing upwards; clay content decreasing upwards.
Brick
22.2
Number of objects per cubic foot
Brick
9.0
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

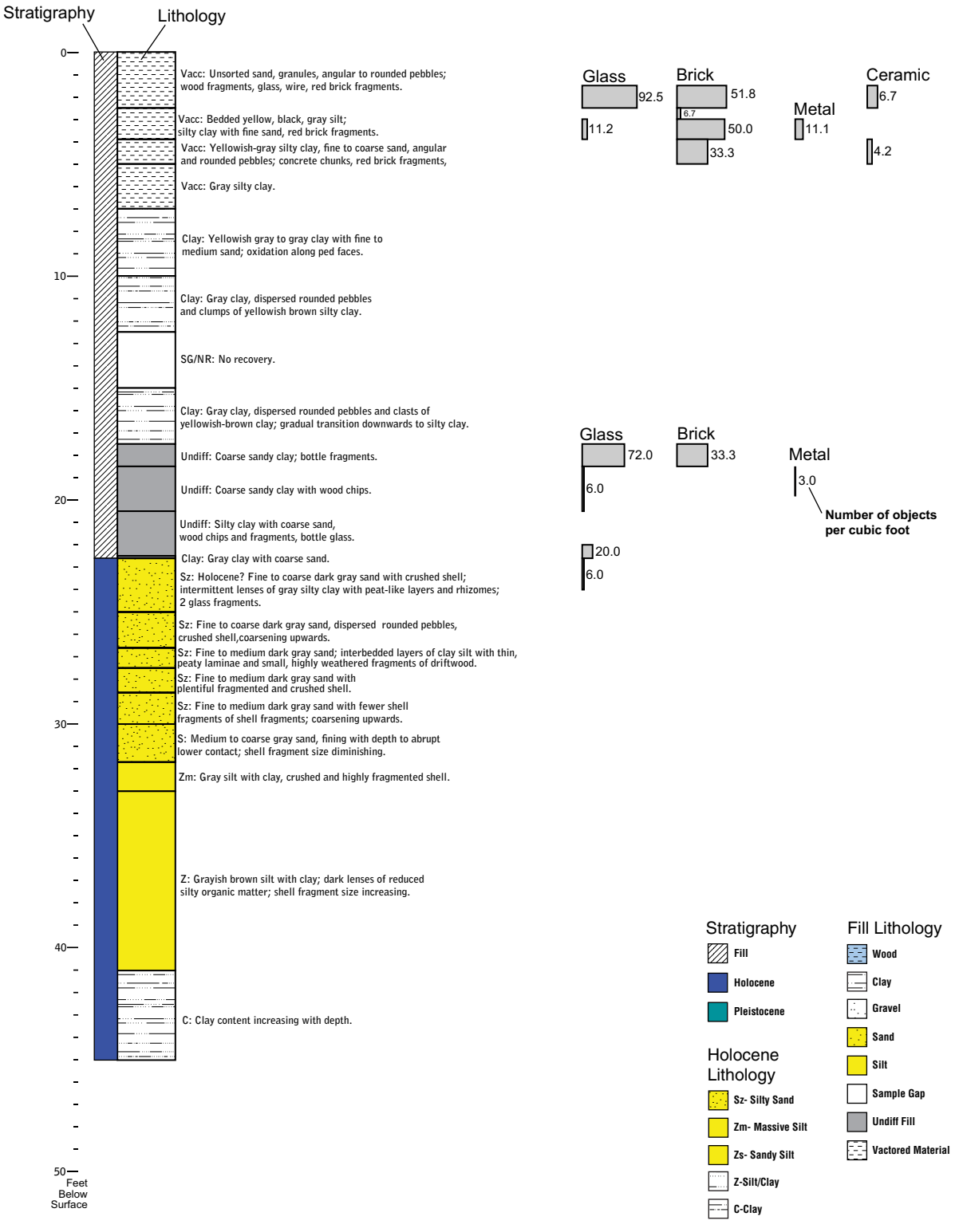
SC-9


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Fine to coarse sand, granules, rounded to angular unsorted pebbles and cobbles <8cmd.
Vacc: Light brown fine to medium sand.
Undiff: Brownish-yellow clay, fine to coarse sand; angular to rounded pebbles and cobbles.
Undiff: Fine to coarse sand, granules, dispersed rounded coarse (32-64mm) pebbles.
SG/NR: No recovery.
Clay: Sandy to pebbly gray to yellowish-gray clay; gray clay clasts.
Undiff: Sandy, pebbly gray clay with yellowish mottling.
Undiff: Gray clay with silt, sand, and subrounded pebbles; sand becomes more plentiful and decreases upwards; brick fragments.
Undiff: Sandy, pebbley gray clay with oxidation; coarsening upward sequence.
Sz: Very dark gray fine to medium sand with silt; fines upward; shell content and size decreases upwards; fine woody debris and roots.
SG/NR:
Zm: Dark brownish-gray clay silt; coarsening upward from clay; gradational lower contact.
C: Dark gray clay with silt; shell content increasing.
Zs: Very dark gray silt with fine sand and clay; dispersed woody debris and organic staining.
Zs: Dark gray-brown clay silt with very fine sandy zones; dispersed shell fragments and whole shells, quantity decreases upwards; dark gray organic staining in upper 3 feet.
Zm: Very dark gray clay silt; clay content decreases upwards; oxidation along exterior and ped fractures.
SG/NR:
Zm: Very dark gray clay and silt; dispersed large shell fragments; few large fragments.
Glass
18.5
87.6
12.0
Ceramic
3.0
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

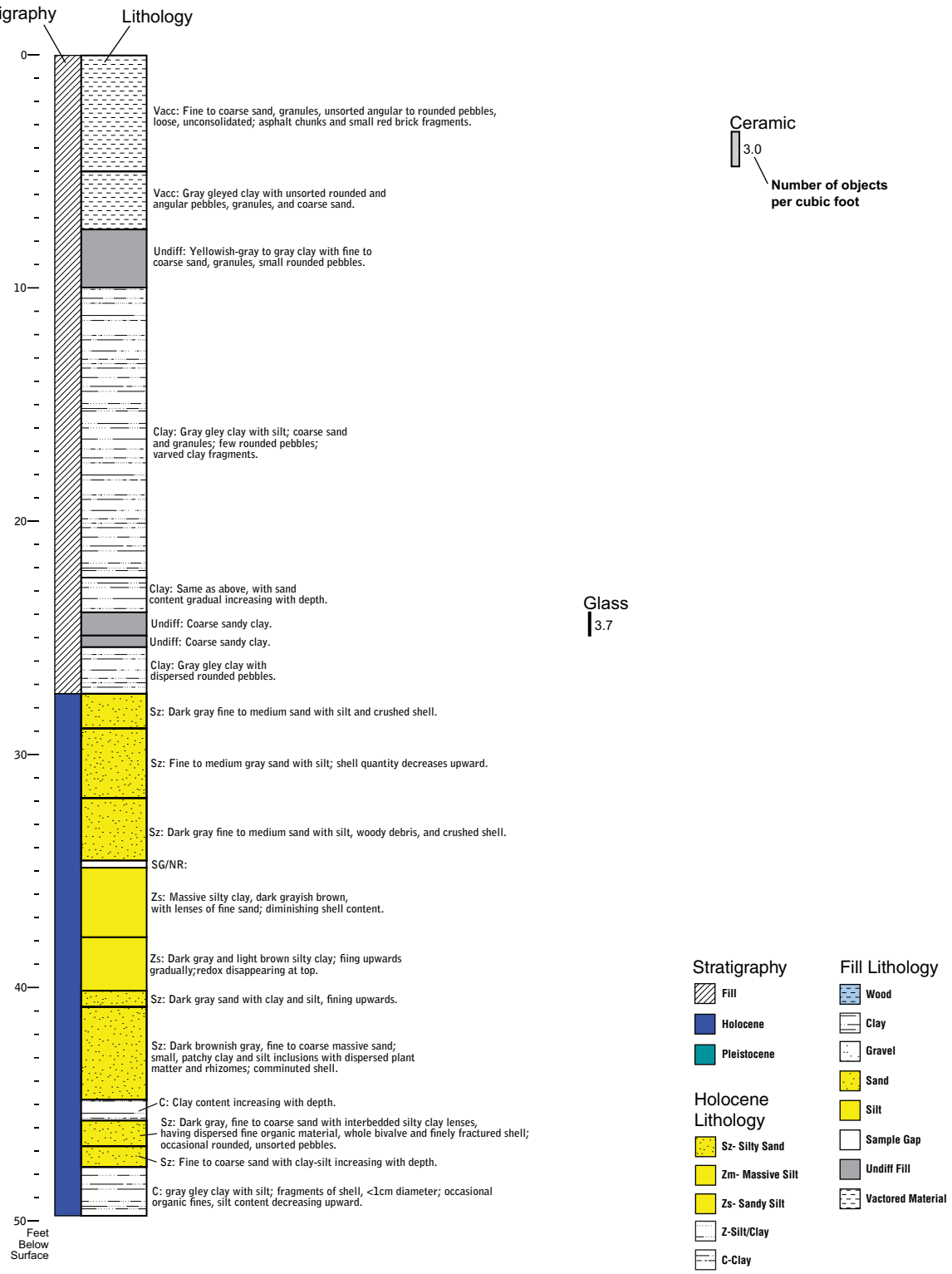
SC-10


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Dark brown fine to coarse sand with clay and subrounded pebbles to 5cm diameter.
Undiff: Yellowish-brown poorly sorted sand with dispersed subrounded pebbles; abrupt lower contact.
Undiff: Medium to coarse sand with clay and silt inclusions increasing with depth; asphalt, red brick, glass, rounded pebbles, railroad spike.
SG/NR: No recovery.
Undiff: Grayish brown medium to coarse sand with clay, subangular pebbles and clay-silt inclusions.
Undiff: Medium gray sandy, silty clay with subrounded pebbles; coarsening upwards from silty clay.
SG/NR: No recovery.
Clay: Gray silty clay with dispersed subrounded pebbles and yellowish-brown oxidation zones and clay varve clasts.
SG/NR: No recovery.
Clay: Gray silty clay with dispersed subrounded pebbles.
Clay: Gray silty clay with dispersed subrounded pebbles, crushed shell.
Sz: Top of Holocene; very dark gray fine to coarse sand with silt; quantity of whole and crushed shell decreasing with depth; coarsening upwards from sand.
S: Black fine to coarse sand with increasing amounts of shell.
SG/NR: No recovery.
Sz: Very dark gray fine to coarse sand with silt, coarsening upwards from silt; quantity of crushed and whole shell increasing upwards.
SG/NR: No recovery.
Z: Dark brownish gray clay and silt with dispersed pockets of fine sand, coarsening upwards from clay; whole shell and small fragments of shell <2cm diameter more abundant with depth.
C: Dark brownish gray silty clay.
Zm: Dark brownish gray clay-silt with dispersed small whole shells and shell fragments.
SG/NR: No recovery.
Zm: Dark brownish gray clay and silt with dispersed small shells and shell fragments.
C: Dark brownish gray silty clay.
Brick
27.0
6.7
Glass
15.0
Brick
57.0
Metal
9.0
Glass
18.3
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

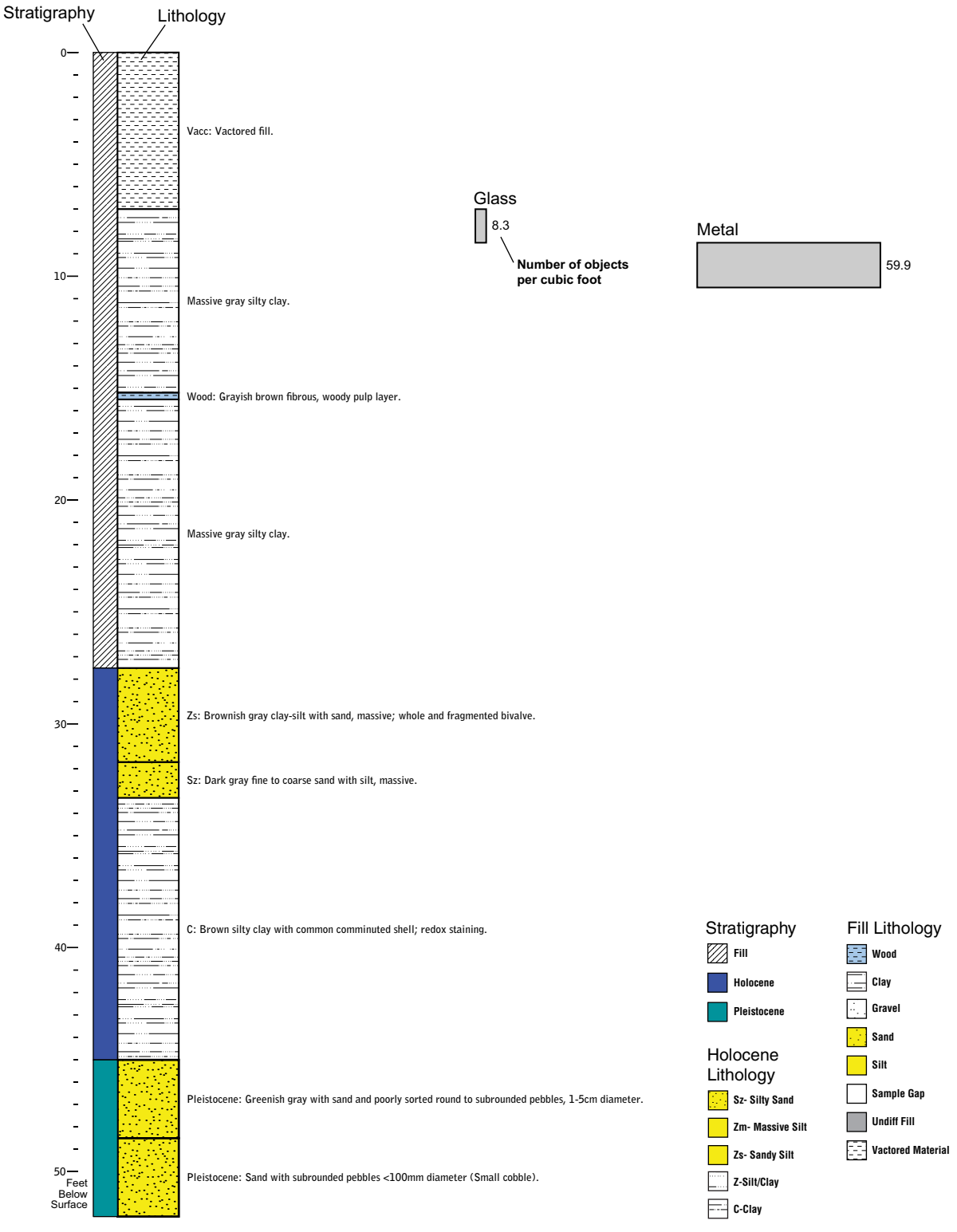
SC-11


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Unsorted sand, granules, angular to rounded pebbles; wood fragments, glass, wire, red brick fragments.
Vacc: Bedded yellow, black, gray silt; silty clay with fine sand, red brick fragments.
Vacc: Yellowish-gray silty clay, fine to coarse sand, angular and rounded pebbles; concrete chunks, red brick fragments,
Vacc: Gray silty clay.
Clay: Yellowish gray to gray clay with fine to medium sand; oxidation along ped faces.
Clay: Gray clay, dispersed rounded pebbles and clumps of yellowish brown silty clay.
SG/NR: No recovery.
Clay: Gray clay, dispersed rounded pebbles and clasts of yellowish-brown clay; gradual transition downwards to silty clay.
Undiff: Coarse sandy clay; bottle fragments.
Undiff: Coarse sandy clay with wood chips.
Undiff: Silty clay with coarse sand, wood chips and fragments, bottle glass.
Clay: Gray clay with coarse sand.
Sz: Holocene? Fine to coarse dark gray sand with crushed shell; intermittent lenses of gray silty clay with peat-like layers and rhizomes; 2 glass fragments.
Sz: Fine to coarse dark gray sand, dispersed rounded pebbles, crushed shell,coarsening upwards.
Sz: Fine to medium dark gray sand; interbedded layers of clay silt with thin, peaty laminae and small, highly weathered fragments of driftwood.
Sz: Fine to medium dark gray sand with plentiful fragmented and crushed shell.
Sz: Fine to medium dark gray sand with fewer shell fragments of shell fragments; coarsening upwards.
S: Medium to coarse gray sand, fining with depth to abrupt lower contact; shell fragment size diminishing.
Zm: Gray silt with clay, crushed and highly fragmented shell.
Z: Grayish brown silt with clay; dark lenses of reduced silty organic matter; shell fragment size increasing.
C: Clay content increasing with depth.
Glass
92.5
11.2
Brick
51.8
6.7
50.0
33.3
Metal
11.1
Ceramic
6.7
4.2
Glass
72.0
6.0
20.0
6.0
Brick
33.3
Metal
3.0
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

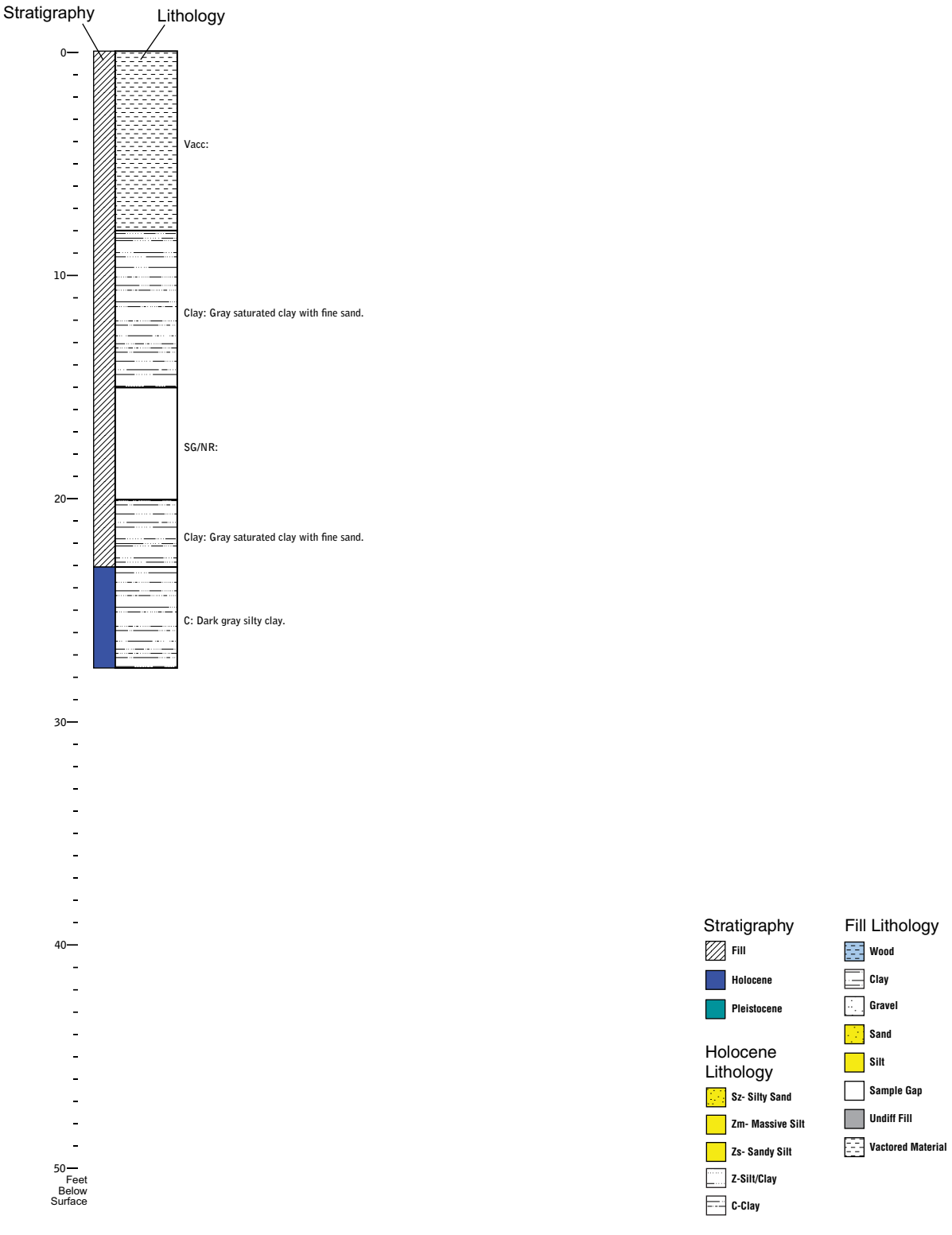
SC-12


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Fine to coarse sand, granules, unsorted angular to rounded pebbles, loose, unconsolidated; asphalt chunks and small red brick fragments.
Vacc: Gray gleyed clay with unsorted rounded and angular pebbles, granules, and coarse sand.
Undiff: Yellowish-gray to gray clay with fine to coarse sand, granules, small rounded pebbles.
Clay: Gray gley clay with silt; coarse sand and granules; few rounded pebbles; varved clay fragments.
Clay: Same as above, with sand content gradual increasing with depth.
Undiff: Coarse sandy clay.
Undiff: Coarse sandy clay.
Clay: Gray gley clay with dispersed rounded pebbles.
Sz: Dark gray fine to medium sand with silt and crushed shell.
Sz: Fine to medium gray sand with silt; shell quantity decreases upward.
Sz: Dark gray fine to medium sand with silt, woody debris, and crushed shell.
SG/NR:
Zs: Massive silty clay, dark grayish brown, with lenses of fine sand; diminishing shell content.
Zs: Dark gray and light brown silty clay; fiing upwards gradually;redox disappearing at top.
Sz: Dark gray sand with clay and silt, fining upwards.
Sz: Dark brownish gray, fine to coarse massive sand; small, patchy clay and silt inclusions with dispersed plant matter and rhizomes; comminuted shell.
C: Clay content increasing with depth.
Sz: Dark gray, fine to coarse sand with interbedded silty clay lenses, having dispersed fine organic material, whole bivalve and finely fractured shell; occasional rounded, unsorted pebbles.
Sz: Fine to coarse sand with clay-silt increasing with depth.
C: gray gley clay with silt; fragments of shell, <1cm diameter; occasional organic fines, silt content decreasing upward.
Ceramic
3.0
Number of objects per cubic foot
Glass
3.7
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

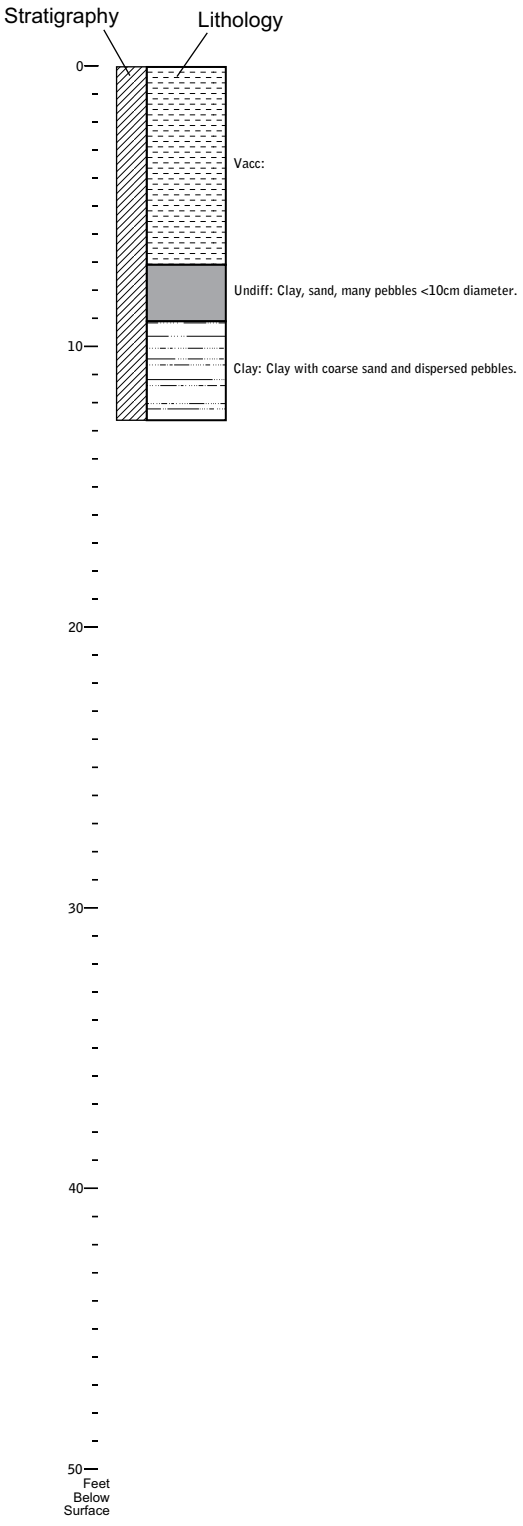
SC-13


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Vactored fill.
Massive gray silty clay.
Wood: Grayish brown fibrous, woody pulp layer.
Massive gray silty clay.
Zs: Brownish gray clay-silt with sand, massive; whole and fragmented bivalve.
Sz: Dark gray fine to coarse sand with silt, massive.
C: Brown silty clay with common comminuted shell; redox staining.
Pleistocene: Greenish gray with sand and poorly sorted round to subrounded pebbles, 1-5cm diameter.
Pleistocene: Sand with subrounded pebbles <100mm diameter (Small cobble).
Glass
8.3
Number of objects per cubic foot
Metal
59.9
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

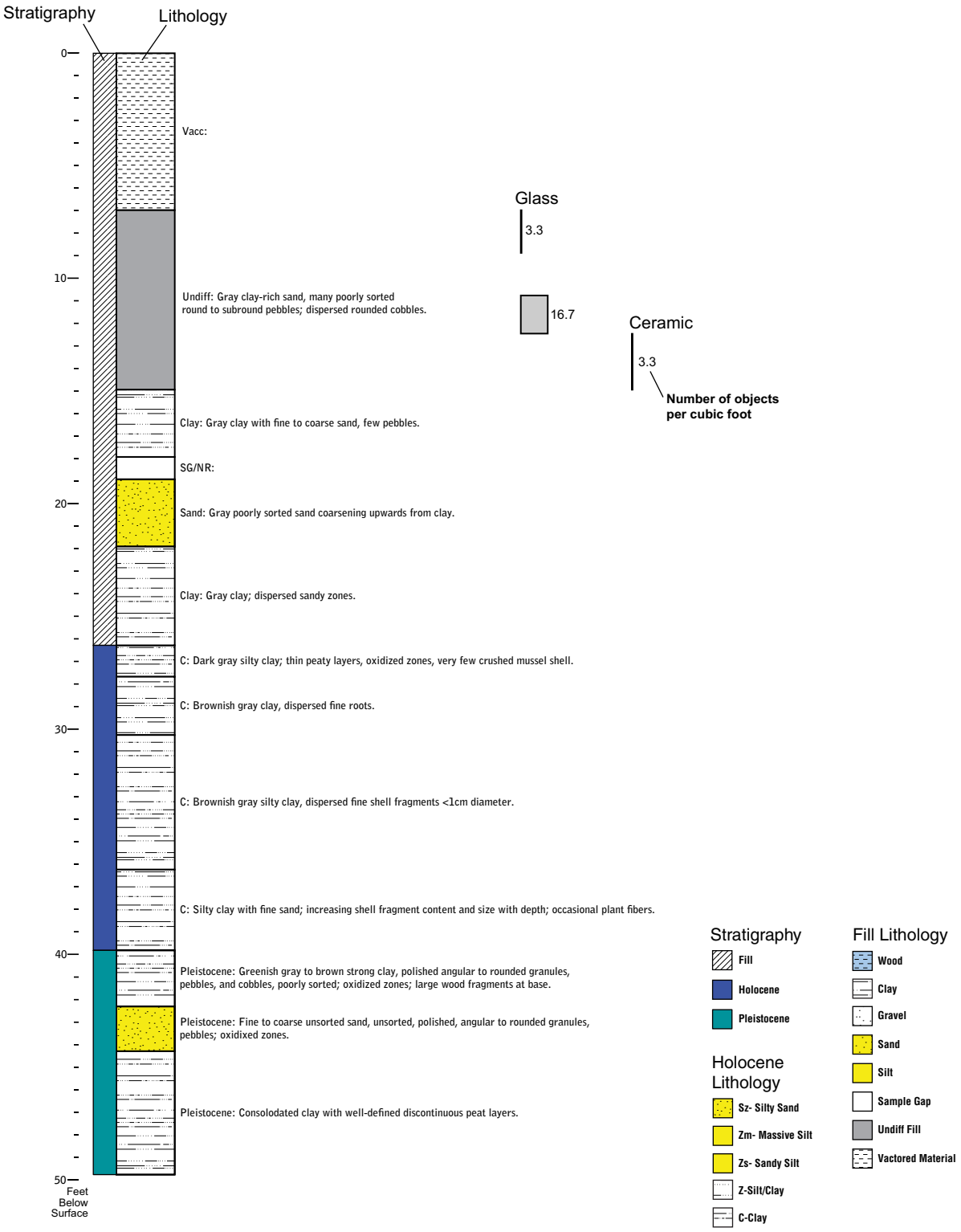
SC-14


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc:
Clay: Gray saturated clay with fine sand.
SG/NR:
Clay: Gray saturated clay with fine sand.
C: Dark gray silty clay.
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

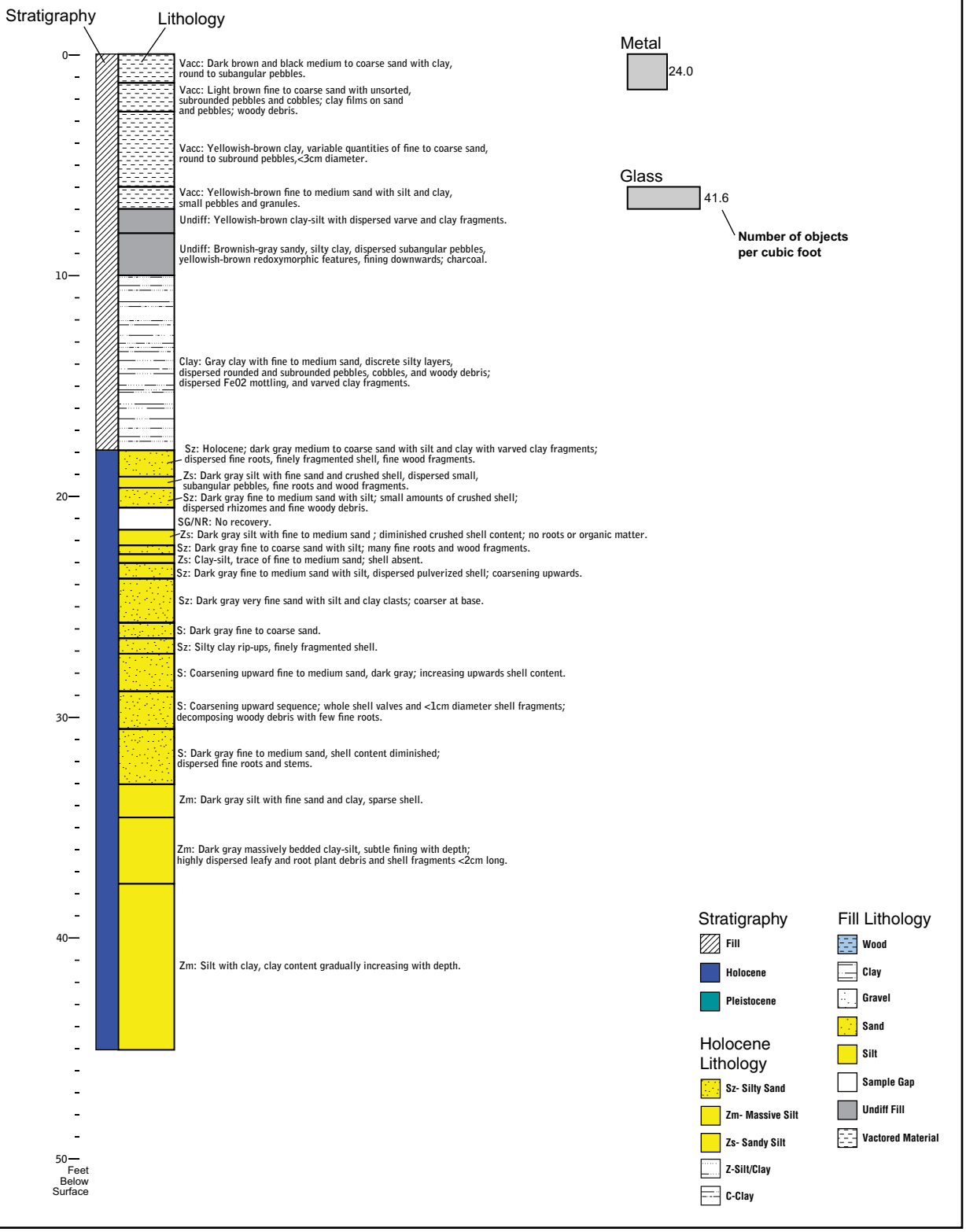
SC-15


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc:
Undiff: Clay, sand, many pebbles <10cm diameter.
Clay: Clay with coarse sand and dispersed pebbles.
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

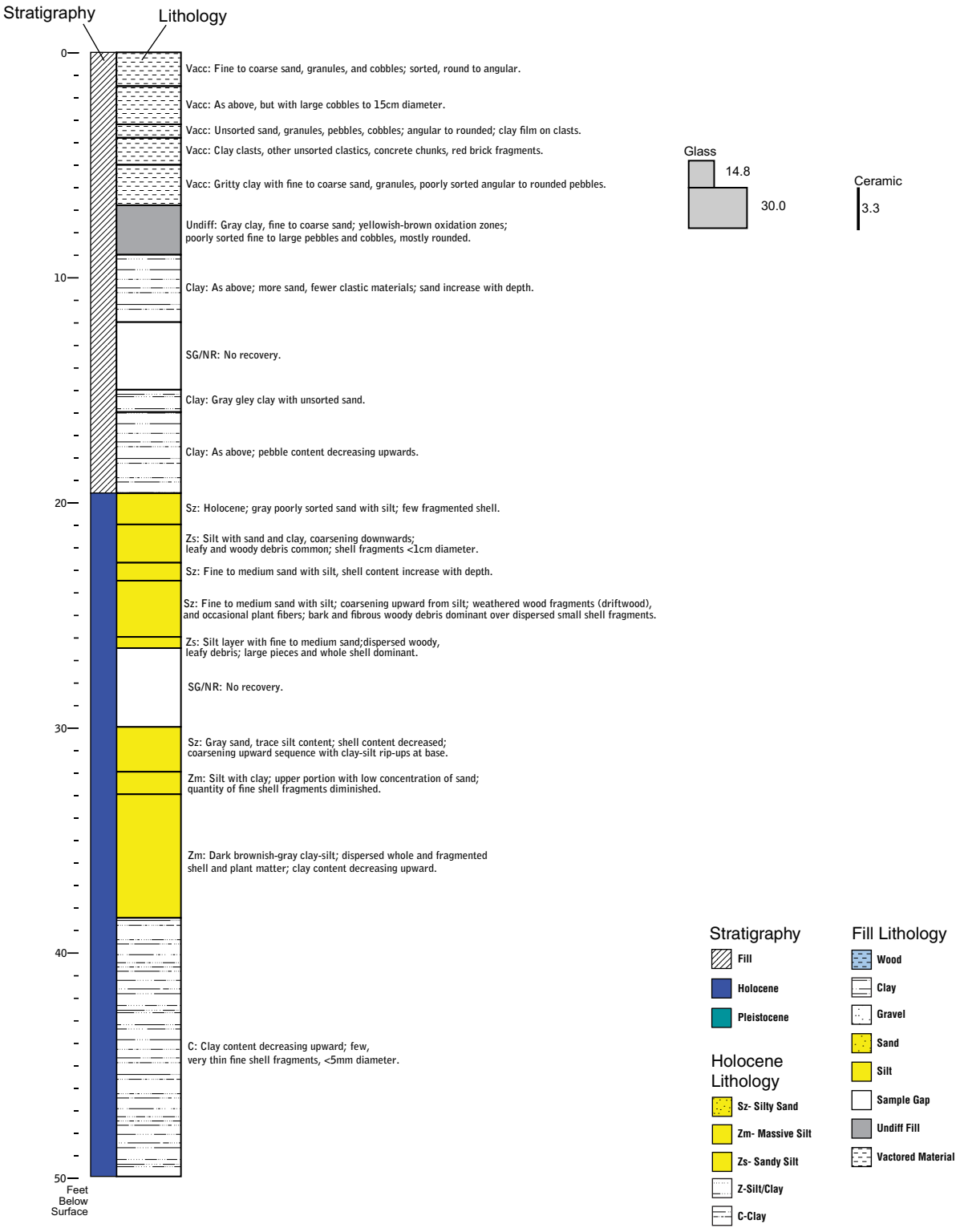
SC-16


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc:
Undiff: Gray clay-rich sand, many poorly sorted round to subround pebbles; dispersed rounded cobbles.
Clay: Gray clay with fine to coarse sand, few pebbles.
SG/NR:
Sand: Gray poorly sorted sand coarsening upwards from clay.
Clay: Gray clay; dispersed sandy zones.
C: Dark gray silty clay; thin peaty layers, oxidized zones, very few crushed mussel shell.
C: Brownish gray clay, dispersed fine roots.
C: Brownish gray silty clay, dispersed fine shell fragments <1cm diameter.
C: Silty clay with fine sand; increasing shell fragment content and size with depth; occasional plant fibers.
Pleistocene: Greenish gray to brown strong clay, polished angular to rounded granules, pebbles, and cobbles, poorly sorted; oxidized zones; large wood fragments at base.
Pleistocene: Fine to coarse unsorted sand, unsorted, polished, angular to rounded granules, pebbles; oxidixed zones.
Pleistocene: Consolodated clay with well-defined discontinuous peat layers.
Glass
3.3
16.7
Ceramic
3.3
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

SC-17


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Dark brown and black medium to coarse sand with clay, round to subangular pebbles.
Vacc: Light brown fine to coarse sand with unsorted, subrounded pebbles and cobbles; clay films on sand and pebbles; woody debris.
Vacc: Yellowish-brown clay, variable quantities of fine to coarse sand, round to subround pebbles,<3cm diameter.
Vacc: Yellowish-brown fine to medium sand with silt and clay, small pebbles and granules.
Undiff: Yellowish-brown clay-silt with dispersed varve and clay fragments.
Undiff: Brownish-gray sandy, silty clay, dispersed subangular pebbles, yellowish-brown redoxymorphic features, fining downwards; charcoal.
Clay: Gray clay with fine to medium sand, discrete silty layers, dispersed rounded and subrounded pebbles, cobbles, and woody debris; dispersed FeO2 mottling, and varved clay fragments.
Sz: Holocene; dark gray medium to coarse sand with silt and clay with varved clay fragments; dispersed fine roots, finely fragmented shell, fine wood fragments.
Zs: Dark gray silt with fine sand and crushed shell, dispersed small, subangular pebbles, fine roots and wood fragments.
Sz: Dark gray fine to medium sand with silt; small amounts of crushed shell; dispersed rhizomes and fine woody debris.
SG/NR: No recovery.
Zs: Dark gray silt with fine to medium sand ; diminished crushed shell content; no roots or organic matter.
Sz: Dark gray fine to coarse sand with silt; many fine roots and wood fragments.
Zs: Clay-silt, trace of fine to medium sand; shell absent.
Sz: Dark gray fine to medium sand with silt, dispersed pulverized shell; coarsening upwards.
Sz: Dark gray very fine sand with silt and clay clasts; coarser at base.
S: Dark gray fine to coarse sand.
Sz: Silty clay rip-ups, finely fragmented shell.
S: Coarsening upward fine to medium sand, dark gray; increasing upwards shell content.
S: Coarsening upward sequence; whole shell valves and <1cm diameter shell fragments; decomposing woody debris with few fine roots.
S: Dark gray fine to medium sand, shell content diminished; dispersed fine roots and stems.
Zm: Dark gray silt with fine sand and clay, sparse shell.
Zm: Dark gray massively bedded clay-silt, subtle fining with depth; highly dispersed leafy and root plant debris and shell fragments <2cm long.
Zm: Silt with clay, clay content gradually increasing with depth.
Metal
24.0
Glass
41.6
Number of objects per cubic foot
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

SC-18


Stratigraphy
Lithology
0
10
20
30
40
50
Feet Below Surface
Vacc: Fine to coarse sand, granules, and cobbles; sorted, round to angular.
Vacc: As above, but with large cobbles to 15cm diameter.
Vacc: Unsorted sand, granules, pebbles, cobbles; angular to rounded; clay film on clasts.
Vacc: Clay clasts, other unsorted clastics, concrete chunks, red brick fragments.
Vacc: Gritty clay with fine to coarse sand, granules, poorly sorted angular to rounded pebbles.
Undiff: Gray clay, fine to coarse sand; yellowish-brown oxidation zones; poorly sorted fine to large pebbles and cobbles, mostly rounded.
Clay: As above; more sand, fewer clastic materials; sand increase with depth.
SG/NR: No recovery.
Clay: Gray gley clay with unsorted sand.
Clay: As above; pebble content decreasing upwards.
Sz: Holocene; gray poorly sorted sand with silt; few fragmented shell.
Zs: Silt with sand and clay, coarsening downwards; leafy and woody debris common; shell fragments <1cm diameter.
Sz: Fine to medium sand with silt, shell content increase with depth.
Sz: Fine to medium sand with silt; coarsening upward from silt; weathered wood fragments (driftwood), and occasional plant fibers; bark and fibrous woody debris dominant over dispersed small shell fragments.
Zs: Silt layer with fine to medium sand;dispersed woody, leafy debris; large pieces and whole shell dominant.
SG/NR: No recovery.
Sz: Gray sand, trace silt content; shell content decreased; coarsening upward sequence with clay-silt rip-ups at base.
Zm: Silt with clay; upper portion with low concentration of sand; quantity of fine shell fragments diminished.
Zm: Dark brownish-gray clay-silt; dispersed whole and fragmented shell and plant matter; clay content decreasing upward.
C: Clay content decreasing upward; few, very thin fine shell fragments, <5mm diameter.
Glass
14.8
30.0
Ceramic
3.3
Stratigraphy
Fill
Holocene
Pleistocene
Holocene Lithology
Sz- Silty Sand
Zm- Massive Silt
Zs- Sandy Silt
Z-Silt/Clay
C-Clay
Fill Lithology
Wood
Clay
Gravel
Sand
Silt
Sample Gap
Undiff Fill
Vactored Material

APPENDIX B: Analyses

TABLE OF CONTENTS

Catalog Codes Key

BORE #: the borehole

BAG #: the bag number assigned to the sample.

SPEC # (specimen number): a numerical value assigned sequentially to different material types recovered in the sample.

WGT: the total weight of the specimen in grams.

VOL: the volume of the sample from which the artifacts were collected in cubic feet. The sample volume is typically a third of a cubic foot but is sometimes less, depending on the volume of the sampled facies.

TOP: the top depth of the sample, measured in feet below surface (fbs) of the borehole.

BOT: the bottom depth of the sample, measured in feet below surface (fbs) of the borehole.

MAT the material type of the item (see below

FRM: the form of the item, as selected from the corresponding material (see below).

TYP: the type of item, as selected from the corresponding material and form (see below).

COUNT: the number of items per specimen.

COUNT/FT3: the quantity of a specimen per cubic foot. This column measures average count per volume derived from a normalized sample size.

WGT/FT3: the weight of a specimen per cubic foot. This column measures average weight per cubic foot derived from a normalized sample size.

COMMENTS: additional comments about a specimen, such as type of seed, embossing or markers on the item, condition, etc.

Material / Form / Type Codes:

MATERIAL
FORM
TYPE

BOT–BOTANICAL
- SED–Seed

FAU–Faunal
- BRD – Bird Bone
- FSH – Fish Bone
- MAM – Mammal Bone
  - BRN – Burned (same for all FAU)
- SHL –Shell
- UNK –Unknown

CER –CERAMICS
- BRK –Brick
- TER–Terra cotta (same for all CER)
- ETH –Earthenware (same for all CER)
  - GLA–Glazed
  - UND–Undecorated
  - UTL –Utilitarian (insulators, water/sewer pipe)

GLS –GLASS
- BAB –Automatic Machine Base
- BHB –Handmade Bottle Bottom
- CHM –Chimney Glass
- FLT –Flat or Window Glass
- UNB –Unknown Process Bottle
  - CLR –Colorless (same for all GLS)
  - PNT–Painted (same for all GLS)
  - BRN –Brown (same for all GLS)
  - BRN –Green (same for all GLS)
  - HON –Honey or straw colored (same for all GLS)

MTL–METAL
- NAI –Nail
  - WIR –Round, wire nail
  - SQU –Square nail
- SCR –Scrap
  - UNK –Unknown
- SPK –Spike
  - RLR – Railroad

OTH –OTHER
- RUB –Rubber
  - UNK –Unknown form or function
- TXT –Textile
  - FLT–Felt
- PAP–Newspaper

PCH – PETROCHEMICAL
- COL –Coal
  - FUE –Fuel

SAM – SAMPLE
- C14 –Carbon 14 sample

WOD – WOOD
- MIL –Milled
  - OTH –other

TABLE B-1. ARTIFACT CATALOG.

BORE #	BAG #	SPEC. #	WGT. (G)	VOL	TOP (ftbs)	BOTTOM (ftbs)	MAT	FRM	TYP	COUNT	#/FT3	WGT./ FT3	COMMENTS
SC01	225	1	1.2	0.33	8	9.5	GLS	UNB	CLR	1	3.3	4.0	
SC01	225	2	0.1	0.33	8	9.5	FAU	SHL	-	-	-	0.3	
SC01	226	-	-	0.33	9.5	11	-	-	-	-	-	-	No recovery
SC01	227	1	0.1	0.33	14	16	FAU	SHL	-	-	-	0.3	Barnacle
SC01	228	-	-	0.15	16	17	-	-	-	-	-	-	No recovery
SC01	229	1	94.1	0.36	17	17.5	WOD	MIL	-	3	8.4	263.5	
SC01	229	2	18.2	0.36	17	17.5	FAU	FSH		8	22.4	51.0	six salmon bone and two salmon vertebrae
SC01	230	1	0.1	0.33	17.5	18.7	FAU	FSH		1	3.3	0.3	salmon cranial bone
SC01	230	2	0.1	0.33	17.5	18.7	FAU	SHL	-	-	-	0.3	Mussel
SC01	231	-	-	0.33	18.7	20	-	-	-	-	-	-	No recovery
SC01	232	1	0.1	0.33	20	21.5	FAU	SHL	-	-	-	0.3	Clam
SC01	233	-	-	0.33	21.5	23	-	-	-	-	-	-	No recovery
SC01	234	-	-	0.33	23	24	-	-	-	-	-	-	No recovery
SC01	235	1	9.9	0.33	25	26	FAU	SHL	-	-	-	33.0	Clam, mussel
SC01	236	1	2.2	0.33	26	27	FAU	SHL	-	-	-	7.3	
SC02	266	1	7.3	0.33	9	10	FAU	SHL	-	-	-	24.3	Oyster, clam
SC02	267	1	7.9	0.33	10	11.1	MTL	AMM	BUL	1	3.3	26.3	bullet; 1957+, Carl Carlson-Drexler, personal communication
SC02	267	2	3.7	0.33	17.9	18	FAU	SHL	-	-	-	12.3	Barnacle, mussel
SC02	268	-	-	0.12	11.1	11.5	-	-	-	-	-	-	No recovery
SC02	269	1	0.2	0.33	11.5	12.5	FAU	SHL	-	-	-	0.7	Mussel, clam
SC02	270	-	-	0.33	12.5	13.2	-	-	-	-	-	-	No recovery
SC02	271	1	0.9	0.33	13.2	14.2	FAU	SHL	-	-	-	3.0	Barnacle
SC02	272	1	0.3	0.33	14.2	15	FAU	SHL	-	-	-	1.0	Barnacle
SC02	273	1	0.1	0.33	15	16	CER	BRK	-	1	3.3	0.3	
SC02	273	2	0.1	0.33	15	16	CER	MOR	-	1	3.3	0.3	
SC02	273	3	2.1	0.33	15	16	FAU	SHL	-	-	-	7.0	Barnacle, clam
SC02	274	1	0.3	0.33	16	16.9	CER	MOR	-	1	3.3	1.0	
SC02	274	2	1.3	0.33	16	16.9	FAU	SHL	-	-	-	4.3	Barnacle, mussel
SC02	275	1	1	0.33	16.9	17.9	FAU	SHL	-	-	-	3.3	Barnacle
SC02	276	-	-	0.33	17.9	18	-	-	-	-	-	-	No recovery
SC02	277	1	0.1	0.33	18	19	CER	MOR	-	1	3.3	0.3	
SC02	277	2	6	0.33	18	19	FAU	SHL	-	-	-	20.0	Barnacle, mussel
SC02	278	1	7.2	0.33	19	20	FAU	SHL	-	-	-	24.0	Barnacle, clam, mussel
SC02	279	1	0.2	0.33	20	21	FAU	SHL	-	-	-	0.7	Clam, mussel
SC02	280	1	1.5	0.33	21	22	FAU	SHL	-	-	-	5.0	Clam
SC03	196	-	-	0.12	8	8.6	-	-	-	-	-	-	No recovery
SC03	197	1	0.2	0.33	8.6	10	FAU	MAM	BRN	1	3.3	0.7	bone shaft, charred
SC03	198	-	-	0.27	10	11.2	-	-	-	-	-	-	No recovery
SC03	199	1	0.5	0.12	11.2	12	FAU	BRD		1	8.4	4.2	sternum fragment
SC03	199	2	0.1	0.12	11.2	12	FAU	SHL	-	-	-	0.8	Mussel, clam
SC03	200	1	1	0.33	12	13.5	FAU	SHL	-	-	-	3.3	Barnacle
SC03	201	1	0.1	0.12	13.8	14	FAU	SHL	-	-	-	0.8	Barnacle, mussel
SC03	202	-	-	0.24	14	14.7	-	-	-	-	-	-	No recovery
SC03	203	-	-	0.33	14.7	15.7	-	-	-	-	-	-	No recovery
SC03	204	-	-	0.12	15.7	16	-	-	-	-	-	-	No recovery
SC03	205	1	0.1	0.33	16	17.5	FAU	SHL	-	-	-	0.3	Barnacle
SC03	206	1	0.1	0.33	17.5	18.8	FAU	SHL	-	-	-	0.3	Barnacle
SC03	207	-	-	0.06	18.8	19.1	-	-	-	-	-	-	No recovery
SC03	208	-	-	0.33	19.1	20	-	-	-	-	-	-	No recovery
SC04	252	1	191.1	0.33	3.5	4.5	WOD	MIL		1	3.3	636.4	disked
SC04	252	2	6.5	0.33	3.5	4.5	FAU	MAM	BRN	8	26.6	21.6	charred mammal bone frags

TABLE B-1. ARTIFACT CATALOG.

BORE #	BAG #	SPEC. #	WGT. (G)	VOL	TOP (ftbs)	BOTTOM (ftbs)	MAT	FRM	TYP	COUNT	#/FT3	WGT./ FT3	COMMENTS
SC04	252	3	0.4	0.33	3.5	4.5	FAU	SHL	-	-	-	1.3	Clam
SC04	253	-	-	0.33	4.5	5.6	-	-	-	-	-	-	No recovery
SC04	254	1	936.8	0.33	15	16..5	MTL	CST	-	1	3.3	3119.5	piece of machinery, flat with hinge, shaped by drill rig
SC04	255	-	-	0.33	19.5	20	-	-	-	-	-	-	No recovery
SC04	256	1	38.1	0.33	20	21.6	WOD	MIL	-	5	16.7	126.9	flat, but not lath, cut to fit a space, molding?
SC04	256	2	0.1	0.33	20	21.6	FAU	SHL	-	-	-	0.3	Clam
SC04	257	1	0.5	0.33	21.6	23	TXT	FAB	-	1	3.3	1.7	
SC04	257	2	0.2	0.33	21.6	23	FAU	SHL	-	-	-	0.7	Barnacle, clam
SC04	258	1	0.3	0.33	23	24.5	FAU	SHL	-	-	-	1.0	Clam
SC04	259	1	12.1	0.33	24.5	25.5	FAU	SHL	-	-	-	40.3	Clam, barnacle
SC04	260	1	11.9	0.33	25.5	26.5	FAU	SHL	-	-	-	39.6	Clam
SC04	261	1	6.7	0.24	26.5	27	FAU	SHL	-	-	-	27.5	Barnacle, clam, mussel
SC04	262	1	98.4	0.3	27	28	FAU	SHL	-	-	-	327.7	Clam, mussel, barnacle
SC04	263	1	39.8	0.33	28	29	FAU	SHL	-	-	-	132.5	Mussel, barnacle, clam
SC04	264	1	5	0.06	29	29.4	FAU	SHL	-	-	-	83.5	Mussel, barnacle, clam
SC04	265	1	10.3	0.33	29.4	30.5	FAU	SHL	-	-	-	34.3	Barnacle, mussel
SC05	85	-	-	0.06	2	2.9	-	-	-	-	-	-	No recovery
SC05	86	-	-	0.24	2.9	3.9	-	-	-	-	-	-	No recovery
SC05	87	-	-	0.24	3.9	5.2	-	-	-	-	-	-	No recovery
SC05	88	1	20.5	0.33	5.2	7	OTH	FLT	-	2	6	61.5	
SC05	89	-	-	0.09	7	7.5	-	-	-	-	-	-	No recovery
SC05	90	-	-	0.33	7.5	9.5	-	-	-	-	-	-	No recovery
SC05	91	-	-	0.15	9.5	10.5	-	-	-	-	-	-	No recovery
SC05	92	-	-	0.33	13.5	15.4	-	-	-	-	-	-	No recovery
SC05	93	1	0.3	0.33	18	19.8	MTL	SCR	UNK	2	6	0.9	scrap, unidentifiable
SC05	93	2	1.8	0.33	18	19.8	FAU	SHL	-	-	-	5.4	Mussel, barnacle
SC05	93	3	0.1	0.33	18	19.8	OTH	RUB	-	2	6	0.3	
SC05	94	1	18.9	0.33	19.8	21.4	WOD	MIL	-	2	6	56.7	possible lath
SC05	94	2	1.7	0.33	19.8	21.4	FAU	SHL	-	-	-	5.1	Mussel, barnacle
SC05	94	3	5.3	0.33	20.1	20.1	FAU	MAM	BRN	2	6	15.9	small, flattened, rounded rectangular object broken in half; heavily oxidized and burned at a high temperature; possibly bone based on porosity
SC05	95	1	7.5	0.27	21.4	23	OTH	PAP	-	25	92.5	27.8	newspaper
SC05	95	2	0.1	0.27	21.4	23	FAU	SHL	-	-	-	0.4	Barnacle
SC05	95	3	1.5	0.27	21.4	23	FAU	BRD		1	3.7	5.6	vertebrae
SC05	96	1	2.4	0.33	23	23.7	FAU	SHL	-	-	-	7.2	Clam
SC05	97	1	-	-	23.7	24.7	SAM	C14	-	-	-	-	
SC05	98	1	28.4	0.33	25	26	FAU	SHL	-	-	-	85.2	Clam, barnacle, mussel
SC05	99	1	177.7	0.33	26	27.2	FAU	SHL	-	-	-	533.1	Clam
SC05	100	1	143.4	0.33	27.2	29.1	FAU	SHL	-	-	-	430.2	Clam, barnacle, mussel, limpet
SC05	101	1	19	0.12	29.1	29.5	FAU	SHL	-	-	-	158.3	Clam, barnacle, limpet
SC05	102	1	5.9	0.33	29.5	32	FAU	SHL	-	-	-	17.7	Clam, barnacle
SC06	1	1	0.2	0.33	0.3	2	MTL	SCR	UNK	2	6	0.6	shavings
SC06	1	2	19.2	0.33	0.3	2	CER	BRK	-	15	45	57.6	1 piece painted; all pieces have mortar
SC06	1	3	1.8	0.33	0.3	2	CER	ETH	GLA	1	3	5.4	tile fragment; green glaze
SC06	2	1	0.5	0.18	2	3	CER	ETH	UND	2	11.1	2.8	unglazed
SC06	2	2	8.3	0.18	2	3	CER	BRK	-	9	50.0	46.1	
SC06	3	1	4.7	0.15	3.5	4	CER	ETH	GLA	2	13.32	31.3	white glaze
SC06	4	-	-	0.33	4	6.5	-	-	-	-	-	-	No recovery

TABLE B-1. ARTIFACT CATALOG.

BORE #	BAG #	SPEC. #	WGT. (G)	VOL	TOP (ftbs)	BOTTOM (ftbs)	MAT	FRM	TYP	COUNT	#/FT3	WGT./ FT3	COMMENTS
SC06	5	-	-	0.33	7.5	9.1	-	-	-	-	-	-	No recovery
SC06	6	-	-	0.15	12	14	-	-	-	-	-	-	No recovery
SC06	7	-	-	0.33	9.1	10	-	-	-	-	-	-	No recovery
SC06	8	-	-	0.33	10	11	-	-	-	-	-	-	No recovery
SC06	9	-	-	0.33	11	12	-	-	-	-	-	-	No recovery
SC06	10	-	-	0.21	14	15	-	-	-	-	-	-	No recovery
SC06	11	-	-	0.33	15	16.7	-	-	-	-	-	-	No recovery
SC06	12	-	-	0.15	16.7	17.5	-	-	-	-	-	-	No recovery
SC06	13	-	-	0.33	17.5	19	-	-	-	-	-	-	No recovery
SC06	14	-	-	0.24	19	20	-	-	-	-	-	-	No recovery
SC06	15	1	421.3	0.33	20	22.5	WOD	MIL	-	1	3	1263.9	molding, no nail marks
SC06	15	2	2.8	0.33	20	22.5	WOD	BMB	-	2	6	8.4	
SC06	16	1	6.5	0.24	22.5	23.5	WOD	MIL	-	9	37.4	27.0	shavings off metal
SC06	16	2	0.1	0.24	22.5	23.5	FAU	FSH		1	4.2	0.4	fragment
SC06	17	1	14.5	0.33	23.5	24.5	FAU	SHL	-	-	-	43.5	Clam, moon snail, barnacle
SC06	18	1	26.1	0.33	24.5	25.5	FAU	SHL	-	-	-	78.3	Clam, barnacle
SC06	19	1	61.3	0.33	25.7	26.5	FAU	SHL	-	-	-	183.9	Clam, barnacle, limpet, mussel
SC06	20	1	128.7	0.33	26.5	29	FAU	SHL	-	-	-	386.1	Barnacle, clam, limpet
SC06	21	1	61.8	0.33	29	30.6	FAU	SHL	-	-	-	185.4	Clam, barnacle, mussel
SC06	22	1	4.6	0.33	30.6	32	FAU	SHL	-	-	-	13.8	Clam, mussel, barnacle
SC06	23	1	5.1	0.33	32	33.3	FAU	SHL	-	-	-	15.3	Mussel, barnacle
SC06	24	1	27	0.33	33.3	35	FAU	SHL	-	-	-	81	Clam, mussel, barnacle, nassa
SC07	25	-	-	0.33	5	6.4	-	-	-	-	-	-	No recovery
SC07	26	-	-	0.24	6.4	7	-	-	-	-	-	-	No recovery
SC07	27	-	-	0.33	7.7	9	-	-	-	-	-	-	No recovery
SC07	28	1	1.9	0.33	9	11	CER	BRK	-	4	12	5.7	
SC07	28	2	133.6	0.33	9	11	WOD	MIL	-	2	6	400.8	1x2?; 1" on one side, cut on other, possibly cedar
SC07	29	-	-	0.33	11	12.5	-	-	-	-	-	-	No recovery
SC07	30	-	-	0.33	12.5	14.2	-	-	-	-	-	-	No recovery
SC07	31	-	-	0.33	14.2	16	-	-	-	-	-	-	No recovery
SC07	32	-	-	0.33	16	17.7	-	-	-	-	-	-	No recovery
SC07	33	1	72.5	0.33	18	18	GLS	BHB	CLR	2	6	217.5	flasked base; MNI=1; 1850s-1920s (Miller et al. 1989:28)
SC07	34	1	0.1	0.33	23	25	BOT	SED	-	1	3	0.3	
SC07	34	2	16.5	0.33	23	25	FAU	SHL	-	-	-	49.5	Clam, barnacle
SC07	35	1	75.9	0.33	25	26.2	FAU	SHL	-	-	-	227.7	Clam, barnacle, limpet, mussel
SC07	36	1	957.1	0.33	26.2	27.5	FAU	SHL	-	-	-	2871.3	Clam, mussel, barnacle
SC07	37	1	275.7	0.33	27.5	28.7	FAU	SHL	-	-	-	827.1	Clam, barnacle, mussel, limpet
SC07	38	1	69.7	0.33	28.7	30	FAU	SHL	-	-	-	209.1	Clam, cockle, mussel, barnacle, limpet
SC07	39	1	4.5	0.33	30.7	33	FAU	SHL	-	-	-	13.5	Barnacle, mussel, clam
SC08	182	-	-	0.33	1.4	3.1	-	-	-	-	-	-	No recovery
SC08	183	-	-	0.18	3.1	4	-	-	-	-	-	-	No recovery
SC08	184	-	-	0.33	10	11.6	-	-	-	-	-	-	No recovery
SC08	185	-	-	0.06	11.6	11.9	-	-	-	-	-	-	No recovery
SC08	186	-	-	0.06	11.9	12.5	-	-	-	-	-	-	No recovery
SC08	187	1	20.9	0.09	12.5	13	CER	BRK	-	2	22.22	232.2	
SC08	188	1	12.6	0.09	15.1	16	FAU	SHL	-	-	-	140.0	Clam, barnacle
SC08	189	-	-	0.24	20	21.5	-	-	-	-	-	-	No recovery

TABLE B-1. ARTIFACT CATALOG.

BORE #	BAG #	SPEC. #	WGT. (G)	VOL	TOP (ftbs)	BOTTOM (ftbs)	MAT	FRM	TYP	COUNT	#/FT3	WGT./ FT3	COMMENTS
SC08	190	1	40.1	0.18	21.5	22.5	FAU	SHL	-	-	-	222.6	Barnacle, clam, mussel
SC08	191	1	3.4	0.33	30	31.7	CER	BRK	-	3	9	10.2	
SC08	191	2	8.8	0.33	30	31.7	FAU	SHL	-	-	-	26.4	Clam, barnacle, mussel
SC08	192	1	15.1	0.33	31.7	34.3	FAU	SHL	-	-	-	45.3	Mussel, clam, barnacle, nucella
SC08	193	1	30.8	0.33	34.5	35.8	FAU	SHL	-	-	-	92.4	Clam, mussel, barnacle
SC08	194	1	4.4	0.09	35.8	36.3	FAU	SHL	-	-	-	48.9	Barnacle, clam, nucella
SC08	195	1	5.1	0.18	36.3	37.6	FAU	SHL	-	-	-	28.3	Clam, barnacle
SC09	141	-	-	0.33	0	1.7	-	-	-	-	-	-	No recovery
SC09	142	1	2.2	0.27	1.7	3	GLS	FLT	CLR	3	11.1	8.1	rounded lip with flat back
SC09	142	2	6	0.27	1.7	3	GLS	UNB	CLR	2	7.4	22.2	1 piece bulbous, 1 piece with linear design
SC09	143	-	-	0.33	3	5	-	-	-	-	-	-	No recovery
SC09	144	1	20.4	0.33	5	6.5	GLS	FLT	CLR	10	30	61.2	burned/melted window glass
SC09	144	2	8.8	0.33	5	6.5	GLS	UNB	CLR	7	21	26.4	
SC09	145	1	0.3	0.33	6.5	8.1	CER	ETH	UND	1	3	0.9	unglazed, possible thin tile
SC09	145	2	5	0.33	6.5	8.1	GLS	FLT	CLR	4	12	15	burned/melted window glass
SC09	146	-	-	0.24	8.1	9	-	-	-	-	-	-	No recovery
SC09	147	-	-	0.12	9	9.6	-	-	-	-	-	-	No recovery
SC09	148	-	-	0.33	11	12.6	-	-	-	-	-	-	No recovery
SC09	149	-	-	0.30	12.6	14	-	-	-	-	-	-	No recovery
SC09	150	1	6.7	0.33	17	18.8	GLS	UNB	GRN	1	3	20.1	melted
SC09	151	1	0.1	0.33	21.8	23.5	FAU	SHL	-	-	-	0.3	Clam
SC09	152	1	3.9	0.33	23.5	24.8	FAU	SHL	-	-	-	11.7	Clam
SC09	153	1	9.8	0.33	25.5	27.5	FAU	SHL	-	-	-	29.4	Barnacle, mussel, clam
SC09	154	1	3.3	0.09	30	31	FAU	SHL	-	-	-	36.7	Clam, mussel
SC09	155	1	7.6	0.24	31	32	FAU	SHL	-	-	-	31.7	Clam, barnacle, nucella
SC09	156	1	3.1	0.27	32	33.5	FAU	SHL	-	-	-	11.5	Clam, barnacle, burned
SC09	157	1	3.1	0.33	33.5	35	FAU	SHL	-	-	-	9.3	Clam
SC09	158	1	0.1	0.06	35	35.5	FAU	SHL	-	-	-	1.7	Clam, burned
SC10	122	1	10.4	0.33	0	1.8	CER	BRK	-	9	27	31.2	
SC10	123	-	-	0.09	1.8	2.3	-	-	-	-	-	-	No recovery
SC10	124	1	11.1	0.15	2.3	2.9	CER	BRK	-	1	6.7	73.9	
SC10	125	-	-	0.12	6.5	7.1	-	-	-	-	-	-	No recovery
SC10	126	-	-	0.33	7.1	8.5	-	-	-	-	-	-	No recovery
SC10	127	1	186.6	0.33	8.5	9.8	MTL	SPK	RLR	1	3	559.8	whole; very rusted
SC10	127	2	6.7	0.33	8.5	9.8	MTL	NAI	SQU	1	3	20.1	head
SC10	127	3	8.4	0.33	8.5	9.8	MTL	NAI	WIR	1	3	25.2	clinched
SC10	127	4	0.5	0.33	8.5	9.8	GLS	FLT	CLR	1	3	1.5	
SC10	127	5	0.1	0.33	8.5	9.8	GLS	CHM	CLR	1	3	0.3	
SC10	127	6	1.6	0.33	8.5	9.8	GLS	UNB	CLR	3	9	4.8	
SC10	127	7	12.6	0.33	8.5	9.8	CER	BRK	-	19	57	37.8	
SC10	128	-	-	0.24	10	11.1	-	-	-	-	-	-	No recovery
SC10	129	-	-	0.09	11.1	11.4	-	-	-	-	-	-	No recovery
SC10	130	-	-	0.33	12	13.6	-	-	-	-	-	-	No recovery
SC10	131	-	-	0.24	13.6	14.5	-	-	-	-	-	-	No recovery
SC10	132	1	6	0.12	15	15.5	GLS	UNB	TNT	1	8.3	50.0	
SC10	133	-	-	0.33	18.5	20	-	-	-	-	-	-	No recovery
SC10	134	-	-	0.33	20	21.5	-	-	-	-	-	-	No recovery
SC10	135	1	7.5	0.15	24.4	25.3	FAU	SHL	-	-	-	50.0	Barnacle, clam, mussel
SC10	136	1	44.8	0.33	25.3	26.5	FAU	SHL	-	-	-	134.4	Barnacle, clam, mussel
SC10	137	1	86.3	0.33	27.5	29.7	FAU	SHL	-	-	-	258.9	Clam, barnacle, mussel, limpet

TABLE B-1. ARTIFACT CATALOG.

BORE #	BAG #	SPEC. #	WGT. (G)	VOL	TOP (ftbs)	BOTTOM (ftbs)	MAT	FRM	TYP	COUNT	#/FT3	WGT./ FT3	COMMENTS
SC10	138	1	15.8	0.33	30	31.5	FAU	SHL	-	-	-	47.4	Clam, barnacle, nucella
SC10	139	-	-	0.33	31.5	33	-	-	-	-	-	-	No recovery
SC10	140	-	-	0.33	33	34.4	-	-	-	-	-	-	No recovery
SC11	40	-	-	0.33	0	1.4	-	-	-	-	-	-	No recovery
SC11	41	-	-	0.06	1.4	1.5	-	-	-	-	-	-	No recovery
SC11	42	1	1	0.33	1.5	2.5	CER	ETH	GLA	1	3	3	white with grey & black speckles; teal stripe
SC11	42	2	0.9	0.27	1.5	2.5	CER	ETH	UND	1	3.7	3.3	unglazed
SC11	42	3	15	0.27	1.5	2.5	GLS	FLT	CLR	4	14.8	55.5	thick; glass blocks?
SC11	42	4	28.2	0.27	1.5	2.5	GLS	FLT	TNT	10	37	104.3	thick; glass blocks?
SC11	42	5	7.5	0.27	1.5	2.5	GLS	FLT	PNT	11	40.7	27.8	thick; one side painted black; same as #43-1
SC11	42	6	12.2	0.27	1.5	2.5	CER	BRK	-	7	25.9	45.1	
SC11	43	1	0.2	0.15	2.5	3	GLS	FLT	PNT	1	6.7	1.3	same as #42-5
SC11	44	1	0.5	0.18	3	3.9	GLS	UNB	CLR	1	5.6	2.8	
SC11	44	2	0.2	0.18	3	3.9	GLS	UNB	BRN	1	5.6	1.1	
SC11	44	3	15.7	0.18	3	3.9	CER	BRK	-	9	50.0	87.1	
SC11	44	4	2.1	0.18	3	3.9	MTL	NAI	WIR	2	11.1	11.7	one head, one shank
SC11	45	1	1	0.24	3.9	5	CER	ETH	UND	1	4.2	4.2	unglazed
SC11	45	2	17.7	0.24	3.9	5	CER	BRK	-	8	33.28	73.6	
SC11	46	-	-	0.33	5	6.5	-	-	-	-	-	-	No recovery
SC11	47	-	-	0.24	6.5	8	-	-	-	-	-	-	No recovery
SC11	48	-	-	0.33	8	9.5	-	-	-	-	-	-	No recovery
SC11	49	-	-	0.12	9.5	10	-	-	-	-	-	-	No recovery
SC11	50	-	-	0.33	10	11.6	-	-	-	-	-	-	No recovery
SC11	51	-	-	0.18	11.6	12.5	-	-	-	-	-	-	No recovery
SC11	52	-	-	0.33	15	17.3	-	-	-	-	-	-	No recovery
SC11	53	1	1.4	0.33	17.5	18.5	GLS	UNB	GRN	1	3	4.2	
SC11	53	2	1.5	0.18	17.5	18.5	CER	BRK	-	6	33.3	8.3	
SC11	53	3	1.5	0.18	17.5	18.5	FAU	SHL	-	-	-	8.3	Mussel, clam
SC11	53	4	0.1	0.18	17.5	18.5	BOT	SED	-	2	11.1	0.6	acorn shell
SC11	53	5	20.9	0.33	17.5	18.5	GLS	UNB	CLR	17	51	62.7	
SC11	53	6	4.2	0.33	17.5	18.5	GLS	CHM	CLR	6	18	12.6	
SC11	54	1	0.4	0.33	18.5	20.5	BOT	SED	-	1	3	1.2	
SC11	54	2	6.2	0.33	18.5	20.5	WOD	MIL	-	1	3	18.6	lath
SC11	54	3	35	0.33	18.5	20.5	GLS	BAB	CLR	1	3	105	"4" embossed in center of base
SC11	54	4	0.1	0.33	18.5	20.5	MTL	NAI	WIR	1	3	0.3	finishing nail; 3d
SC11	54	5	1.2	0.33	18.5	20.5	GLS	UNB	CLR	2	6	3.6	
SC11	55	1	4.8	0.15	22	22.6	GLS	UNB	CLR	3	19.98	32.0	
SC11	55	2	0.2	0.15	22	22.6	FAU	SHL	-	-	-	1.3	Clam, barnacle
SC11	56	1	1.6	0.33	22.6	24	GLS	FLT	CLR	2	6	4.8	
SC11	56	2	24.5	0.33	22.6	24	FAU	SHL	-	-	-	73.5	Clam, mussel, barnacle
SC11	57	1	13	0.30	24	25	FAU	SHL	-	-	-	43.3	Barnacle, mussel, clam
SC11	58	1	1.5	0.33	25	26.6	GLS	UNB	CLR	2	6	4.5	MNI=1
SC11	58	2	11.3	0.33	25	26.6	FAU	SHL	-	-	-	33.9	Clam, mussel, barnacle, limpet
SC11	59	1	7.2	0.33	26.6	27.5	FAU	SHL	-	-	-	21.6	Clam, barnacle, mussel
SC11	60	1	36	0.33	27.5	28.6	FAU	SHL	-	-	-	108	Barnacle, clam, mussel
SC11	61	1	15.4	0.33	28.6	29.6	FAU	SHL	-	-	-	46.2	Clam, mussel, barnacle
SC11	62	1	3.9	0.15	29.6	30	FAU	SHL	-	-	-	26.0	Mussel, barnacle
SC11	63	1	13.8	0.33	30	31.3	FAU	SHL	-	-	-	41.4	Mussel, clam, barnacle
SC11	64	1	4.1	0.12	31.3	31.7	FAU	SHL	-	-	-	34.2	Clam, mussel
SC11	65	1	6.6	0.30	31.7	32.4	FAU	SHL	-	-	-	22.0	Clam, barnacle, burned
SC12	66	-	-	0.33	0	1.4	-	-	-	-	-	-	No recovery

TABLE B-1. ARTIFACT CATALOG.

BORE #	BAG #	SPEC. #	WGT. (G)	VOL	TOP (ftbs)	BOTTOM (ftbs)	MAT	FRM	TYP	COUNT	#/FT3	WGT./ FT3	COMMENTS
SC12	67	-	-	0.33	1.4	2.1	-	-	-	-	-	-	No recovery
SC12	68	1	0.1	0.15	2.1	2.5	FAU	SHL	-	-	-	0.7	Barnacle
SC12	69	1	2.3	0.33	2.5	4	CER	ETH	UND	1	3	6.9	unglazed
SC12	70	-	-	0.24	4	5	-	-	-	-	-	-	No recovery
SC12	71	-	-	0.33	5	7.5	-	-	-	-	-	-	No recovery
SC12	72	-	-	0.15	7.5	8.1	-	-	-	-	-	-	No recovery
SC12	73	-	-	0.15	12.1	14	-	-	-	-	-	-	No recovery
SC12	74	-	-	0.33	18.4	20	-	-	-	-	-	-	No recovery
SC12	75	-	-	0.24	21.4	22.5	-	-	-	-	-	-	No recovery
SC12	76	1	7.2	0.27	24	25	GLS	UNB	HON	1	3.7	26.6	
SC12	77	-	-	0.15	25	25.5	-	-	-	-	-	-	No recovery
SC12	78	1	27.9	0.33	27.5	29	FAU	SHL	-	-	-	83.7	Clam, barnacle, mussel
SC12	79	1	52	0.33	29	30.6	FAU	SHL	-	-	-	156	Barnacle, clam, mussel
SC12	80	1	66.8	0.30	30.6	32	FAU	SHL	-	-	-	222.4	Clam, mussel, barnacle
SC12	81	1	74.2	0.33	32	33.7	FAU	SHL	-	-	-	222.6	Clam, mussel, barnacle, cockle
SC12	82	1	73.3	0.27	33.7	35	FAU	SHL	-	-	-	271.2	Clam, barnacle, mussel
SC12	83	1	3.2	0.33	35	36.7	FAU	SHL	-	-	-	9.6	Clam, barnacle, gastropod
SC12	84	1	7.3	0.33	36.7	38	FAU	SHL	-	-	-	21.9	Clam, mussel
SC13	209	1	2.5	0.33	7	8.5	GLS	FLT	CLR	1	8.3	3.3	
SC13	209	2	0.1	0.33	7	8.5	FAU	SHL	-	-	-	0.3	Barnacle, clam
SC13	210	1	12.6	0.33	8.5	10.5	WOD	MIL	-	3	10.0	42.0	
SC13	210	2	37.3	0.33	8.5	10.5	MTL	SCR	-	18	59.9	124.2	flat, thin, bent
SC13	210	3	0.8	0.33	8.5	10.5	FAU	SHL	-	-	-	2.7	Clam
SC13	211	-	-	0.33	13.5	15.2	-	-	-	-	-	-	No recovery
SC13	212	-	-	0.06	15.2	15.5	-	-	-	-	-	-	No recovery
SC13	213	-	-	0.12	15.5	16.5	-	-	-	-	-	-	No recovery
SC13	214	1	83.8	0.33	22	23.5	WOD	MIL	-	2	6.7	279.1	
SC13	214	2	0.7	0.33	22	23.5	FAU	SHL	-	-	-	2.3	Clam
SC13	215	-	-	0.33	23.5	25	-	-	-	-	-	-	No recovery
SC13	216	1	0.2	0.33	19.5	21	BOT	SED	-	1	3.3	0.7	pumpkin
SC13	216	2	0.5	0.33	19.5	21	FAU	SHL	-	-	-	1.7	Clam
SC13	217	1	43.6	0.33	27.5	29	FAU	SHL	-	-	-	145.2	Clam
SC13	218	1	0.1	0.33	29	31	FAU	FSH		1	3.3	0.3	crustacean claw
SC13	218	2	0.2	0.33	29	31	FAU	MAM		2	6.7	0.7	ungulate tooth fragment
SC13	218	3	39.4	0.33	29	31	FAU	SHL	-	-	-	131.2	Nucella, barnacle
SC13	218	3	0.1	0.33	29	31	FAU	FSH		1	3.3	0.3	fragment
SC13	219	1	0.1	0.33	21	22	FAU	SHL	-	-	-	0.3	Clam
SC13	220	1	10.6	0.12	31	31.7	FAU	SHL	-	-	-	89.0	
SC13	221	1	0.6	0.24	31.7	33.3	FAU	SHL	-	-	-	2.5	Clam, mussel
SC13	222	1	11.1	0.33	33.3	34.5	FAU	SHL	-	-	-	37.0	Nucella
SC13	223	1	0.1	0.33	34.5	36.3	FAU	SHL	-	-	-	0.3	Clam, barnacle
SC13	224	1	0.1	0.33	36.3	37.5	FAU	SHL	-	-	-	0.3	Clam, nucella
SC14	282	-	-	0.33	8	10	-	-	-	-	-	-	No recovery
SC14	283	-	-	0.33	13	15	-	-	-	-	-	-	No recovery
SC14	284	1	3.1	0.33	20	22	CER	MOR	-	4	13.3	10.3	
SC14	285	-	-	0.33	23	24	-	-	-	-	-	-	No recovery
SC14	286	1	17.4	0.33	24.5	26	FAU	SHL	-	-	-	57.9	Barnacle, clam
SC14	287	1	34.2	0.18	26	27	FAU	SHL	-	-	-	191.5	Clam
SC15	281	-	-	0.33	7	8.8	-	-	-	-	-	-	No recovery
SC16	237	1	1.8	0.33	7	8.9	GLS	UNB	CLR	1	3.3	6.0	Bottle corner, pharm bottle?
SC16	238	-	-	0.33	8.9	10.8	-	-	-	-	-	-	No recovery
SC16	239	1	5	0.33	10.8	12.5	GLS	PRS	CLR	1	16.7	3.3	shard too small to be identified

TABLE B-1. ARTIFACT CATALOG.

BORE #	BAG #	SPEC. #	WGT. (G)	VOL	TOP (ftbs)	BOTTOM (ftbs)	MAT	FRM	TYP	COUNT	#/FT3	WGT./ FT3	COMMENTS
SC16	240	-	-	0.33	12.5	15	-	-	-	-	-	-	No recovery
SC16	241	1	14.4	0.33	15	17	WOD	MIL	-	1	3.3	48.0	small, thin
SC16	242	-	-	0.33	17	18	-	-	-	-	-	-	No recovery
SC16	243	-	-	0.33	19.9	22	-	-	-	-	-	-	No recovery
SC16	244	-	-	0.33	22	23.2	-	-	-	-	-	-	No recovery
SC16	245	-	-	0.33	28.4	30	-	-	-	-	-	-	No recovery
SC16	246	1	7.1	0.33	12.5	15	CER	TER	PIP	1	3.3	23.6	
SC16	246	2	0.5	0.33	28.4	30	FAU	SHL	-	-	-	1.7	
SC16	247	1	5.1	0.21	30	30.4	FAU	SHL	-	-	-	24.0	Clam, barnacle
SC16	248	1	18.4	0.33	30.4	32	FAU	SHL	-	-	-	61.3	Clam
SC16	249	1	3.1	0.33	32	33.3	FAU	SHL	-	-	-	10.3	Clam
SC16	250	1	22.4	0.33	33.3	34.6	FAU	SHL	-	-	-	74.6	Clam
SC16	251	1	80.8	0.33	34.6	36.1	FAU	SHL	-	-	-	269.1	Clam
SC17	159	1	1.4	0.33	0	1.6	GLS	FLT	CLR	1	3	4.2	
SC17	159	2	5.1	0.33	0	1.6	GLS	UNB	CLR	6	18	15.3	MNI=4
SC17	159	3	0.2	0.33	0	1.6	GLS	UNB	GRN	1	3	0.6	
SC17	160	-	-	0.24	1.3	2.6	-	-	-	-	-	-	No recovery
SC17	161	-	-	0.33	2.6	3.6	-	-	-	-	-	-	No recovery
SC17	162	-	-	0.33	3.6	5.4	-	-	-	-	-	-	No recovery
SC17	163	-	-	0.21	5.4	6	-	-	-	-	-	-	No recovery
SC17	164	1	4.2	0.12	6	7	GLS	UNB	GRN	4	33.32	35.0	
SC17	164	2	1.8	0.12	6	7	GLS	UNB	CLR	1	8.3	15.0	possible corner of base
SC17	165	-	-	0.15	7	8.1	-	-	-	-	-	-	No recovery
SC17	166	-	-	0.33	8.1	10	-	-	-	-	-	-	No recovery
SC17	167	-	-	0.33	10	11.7	-	-	-	-	-	-	No recovery
SC17	168	-	-	0.21	11.7	13	-	-	-	-	-	-	No recovery
SC17	169	-	-	0.33	16	17.5	-	-	-	-	-	-	No recovery
SC17	170	1	4.2	0.18	17.9	19.1	FAU	SHL	-	-	-	23.3	Clam, barnacle
SC17	171	-	-	0.15	19.1	19.6	-	-	-	-	-	-	No recovery
SC17	172	1	1.9	0.18	19.6	20.5	FAU	SHL	-	-	-	10.5	Barnacle, limpet, clam
SC17	173	1	0.1	0.12	21.5	22.2	FAU	SHL	-	-	-	0.8	Barnacle, limpet
SC17	174	-	-	0.06	22.2	22.6	-	-	-	-	-	-	No recovery
SC17	175	-	-	0.09	22.6	23	-	-	-	-	-	-	No recovery
SC17	176	-	-	0.15	23	23.7	-	-	-	-	-	-	No recovery
SC17	177	1	2.6	0.15	23	23.7	FAU	SHL	-	-	-	17.3	Barnacle, limpet
SC17	178	1	17.3	0.24	25.1	25.7	FAU	SHL	-	-	-	72.0	Clam, mussel, barnacle
SC17	179	1	43.9	0.18	25.7	26.4	FAU	SHL	-	-	-	243.6	Clam, barnacle, mussel
SC17	180	1	27.5	0.18	26.4	27.1	FAU	SHL	-	-	-	152.6	
SC17	181	1	7.36	0.21	27.1	27.9	FAU	SHL	-	-	-	35.0	Mussel, barnacle
SC18	103	-	-	0.33	0	1.5	-	-	-	-	-	-	No recovery
SC18	104	-	-	0.33	1.5	3.2	-	-	-	-	-	-	No recovery
SC18	105	-	-	0.24	3.2	3.8	-	-	-	-	-	-	No recovery
SC18	106	1	3.3	0.27	3.8	5	GLS	UNB	CLR	3	11.1	12.2	
SC18	106	2	1.3	0.27	3.8	5	GLS	UNB	BRN	1	3.7	4.8	
SC18	107	1	3.8	0.30	5	6.8	CER	TER	UTL	1	3.3	12.7	unglazed, burned
SC18	107	2	1.6	0.30	5	6.8	GLS	UNB	CLR	2	6.7	5.3	exterior design (MNI=1)
SC18	107	3	0.1	0.30	5	6.8	FAU	SHL	-	-	-	0.3	Clam
SC18	107	4	1	0.30	5	6.8	GLS	UNB	CLR	1	3.3	3.3	exterior design (MNI=1)
SC18	107	5	5.4	0.30	5	6.8	GLS	UNB	CLR	6	19.98	18.0	
SC18	108	-	-	0.33	6.8	8	-	-	-	-	-	-	No recovery
SC18	109	-	-	0.33	8	9	-	-	-	-	-	-	No recovery
SC18	110	-	-	0.15	9	9.8	-	-	-	-	-	-	No recovery
SC18	111	-	-	0.33	15	16.8	-	-	-	-	-	-	No recovery
SC18	112	-	-	0.33	16.8	18	-	-	-	-	-	-	No recovery

TABLE B-1. ARTIFACT CATALOG.

BORE #	BAG #	SPEC. #	WGT. (G)	VOL	TOP (ftbs)	BOTTOM (ftbs)	MAT	FRM	TYP	COUNT	#/FT3	WGT./ FT3	COMMENTS
SC18	113	1	4	0.21	19.6	21	FAU	SHL	-	-	-	19.0	Clam, barnacle
SC18	113	2	0.1	-	20.3	20.3	BOT	SED	-	1	-	-	point data
SC18	114	1	16.9	0.33	21	22.7	FAU	SHL	-	-	-	50.7	Barnacle, mussel, clam, most appear burned
SC18	115	1	114.6	0.33	22.7	23.5	FAU	SHL	-	-	-	343.8	Clam, barnacle, mussel, limpet
SC18	116	1	112.3	0.33	23.5	25.1	FAU	SHL	-	-	-	336.9	Barnacle, clam, mussel, limpet
SC18	117	1	0.2	0.09	25.1	26	BOT	SED	-	1	11.11	2.2	
SC18	117	2	12	0.09	25.1	26	FAU	SHL	-	-	-	133.3	Barnacle, mussel, possibly burned
SC18	118	1	203.4	0.21	26	26.5	FAU	SHL	-	-	-	968.2	Clam, barnacle, mussel, nucella
SC18	119	1	-	0.33	30	31.7	PCH	COL	FUE	11	-	-	noted, not collected; bituminous
SC18	119	2	5.7	0.33	30	31.7	FAU	SHL	-	-	-	17.1	Mussel, clam, barnacle
SC18	120	1	2.1	0.18	31.7	32	FAU	SHL	-	-	-	11.7	Barnacle, clam
SC18	121	1	10.4	0.27	32	33	FAU	SHL	-	-	-	38.5	Clam

Shell Summary

by Robert Kopperl (with additional analysis by Alex Stevenson)

The shell recovered from the SR519 coring project were examined in terms of broad taxonomic categories, size and inferred age of clam specimens, and presence of unusual taxa or burning (see Table B-2). The dominant taxon in most of the core level bags is clam. Despite the extent of fragmentation of the entire shell assemblage, by far the majority of specimens identifiable to a finer level are bent-nosed clam (*Macoma nasuta*). This species is very common in sandy intertidal areas of Puget Sound, yet it is not considered particularly important to historic commercial shellfisheries, or to pre-contact Native American subsistence economies based on the paucity of their identification in shell middens (e.g., Ford 1995; Harbo 1997). Of those species considered economically important, butter clams (*Saxidomus giganteus*), cockles (*Clinocardium* sp.), and fragments of native littleneck or introduced manila clams (*Protothaca staminea*/*Tapes philipparinum*) were found in relatively small numbers in the SR519 assemblage. Most of the intact clam shell fragments were from small individuals, less than 1 inch in maximum width. Along with clams, mussels and barnacles were found in quantity throughout the assemblage and occasional limpets and gastropods (*Nucella* sp., *Nassa* sp., and *Polinices lewisii*) were identified as well. This taxonomic diversity and the generally small size of the clam specimens suggest that the shell assemblage represent either *in situ* natural populations or natural shell beds moved in their entirety as fill, and not targeted utilization of the shellfish themselves. The shells from a few of the core level bags (the deeper portions of Core 9, 11, 12, and 18) exhibited burning, which would have occurred after the shells were removed from their natural habitat.

References

Ford, Pamela J.. 1995. Inverterbrate Fauna. In, *The Archaeology of West Point, Seattle, Washington: 4,000 Years of Hunter-Fisher-Gatherer Land Use in Southern Puget Sound*, edited by L. Larson and D. Lewarch, Appendix 6. LAAS report submitted to CH2M Hill and prepared for the King County Department of Metropolitan Services, Seattle, Washington.

Harbo, Rick M. 1997. *Shells and Shellfish of the Pacific Northwest*. Harbour Publishing, Madeira Park, British Columbia.

Key to Table B-2

BORE: sonicore number

BAG: sample identification number

SPEC: specimen number in that sample

WGT.(g): weight of sample in grams

VOL.: volume of sample in cubic feet

TOP: top elevation of sample in feet

BOT: bottom elevation of sample in feet

WGT/FT3: normalized weight by one cubic foot, in grams

COMMENTS: shell identification

TABLE B-2. SHELL CATALOG.

BORE	BAG	SPEC	WGT (g)	VOL	TOP	BOT	WGT/FT3	COMMENTS
SC01	225	2	0.1	0.33	8.0	9.5	0.3	
SC01	227	1	0.1	0.33	14.0	16.0	0.3	Barnacle
SC01	230	2	0.1	0.33	17.5	18.7	0.3	Mussel
SC01	232	1	0.1	0.33	20.0	21.5	0.3	Clam
SC01	235	1	9.9	0.33	25.0	26.0	33.0	Clam, mussel
SC01	236	1	2.2	0.33	26.0	27.0	7.3	
SC02	266	1	7.3	0.33	9.0	10.0	24.3	Oyster, clam
SC02	267	2	3.7	0.33	17.9	18.0	12.3	Barnacle, mussel
SC02	269	1	0.2	0.33	11.5	12.5	0.7	Mussel, clam
SC02	271	1	0.9	0.33	13.2	14.2	3.0	Barnacle
SC02	272	1	0.3	0.33	14.2	15.0	1.0	Barnacle
SC02	273	3	2.1	0.33	15.0	16.0	7.0	Barnacle, clam
SC02	274	2	1.3	0.33	16.0	16.9	4.3	Barnacle, mussel
SC02	275	1	1.0	0.33	16.9	17.9	3.3	Barnacle
SC02	277	2	6.0	0.33	18.0	19.0	20.0	Barnacle, mussel
SC02	278	1	7.2	0.33	19.0	20.0	24.0	Barnacle, clam, mussel
SC02	279	1	0.2	0.33	20.0	21.0	0.7	Clam, mussel
SC02	280	1	1.5	0.33	21.0	22.0	5.0	Clam
SC03	199	2	0.1	0.12	11.2	12.0	0.8	Mussel, clam
SC03	200	1	1.0	0.33	12.0	13.5	3.3	Barnacle
SC03	201	1	0.1	0.12	13.8	14.0	0.8	Barnacle, mussel
SC03	205	1	0.1	0.33	16.0	17.5	0.3	Barnacle
SC03	206	1	0.1	0.33	17.5	18.8	0.3	Barnacle
SC04	252	3	0.4	0.33	3.5	4.5	1.3	Clam
SC04	256	2	0.1	0.33	20.0	21.6	0.3	Clam
SC04	257	2	0.2	0.33	21.6	23.0	0.7	Barnacle, clam
SC04	258	1	0.3	0.33	23.0	24.5	1.0	Clam
SC04	259	1	12.1	0.33	24.5	25.5	40.3	Clam, barnacle
SC04	260	1	11.9	0.33	25.5	26.5	39.6	Clam
SC04	261	1	6.7	0.24	26.5	27.0	27.5	Barnacle, clam, mussel
SC04	262	1	98.4	0.3	27.0	28.0	327.7	Clam, mussel, barnacle
SC04	263	1	39.8	0.33	28.0	29.0	132.5	Mussel, barnacle, clam
SC04	264	1	5.0	0.06	29.0	29.4	83.5	Mussel, barnacle, clam
SC04	265	1	10.3	0.33	29.4	30.5	34.3	Barnacle, mussel

TABLE B-2. SHELL CATALOG.

BORE	BAG	SPEC	WGT (g)	VOL	TOP	BOT	WGT/FT3	COMMENTS
SC05	93	2	1.8	0.33	18.0	19.8	5.4	Mussel, barnacle
SC05	94	2	1.7	0.33	19.8	21.4	5.1	Mussel, barnacle
SC05	95	2	0.1	0.27	21.4	23.0	0.4	Barnacle
SC05	96	1	2.4	0.33	23.0	23.7	7.2	Clam
SC05	98	1	28.4	0.33	25.0	26.0	85.2	Clam, barnacle, mussel
SC05	99	1	177.7	0.33	26.0	27.2	533.1	Clam
SC05	100	1	143.4	0.33	27.2	29.1	430.2	Clam, barnacle, mussel, limpet
SC05	101	1	19.0	0.12	29.1	29.5	158.3	Clam, barnacle, limpet
SC05	102	1	5.9	0.33	29.5	32.0	17.7	Clam, barnacle
SC06	17	1	14.5	0.33	23.5	24.5	43.5	Clam, moon snail, barnacle
SC06	18	1	26.1	0.33	24.5	25.5	78.3	Clam, barnacle
SC06	19	1	61.3	0.33	25.7	26.5	183.9	Clam, barnacle, limpet, mussel
SC06	20	1	128.7	0.33	26.5	29.0	386.1	Barnacle, clam, limpet
SC06	21	1	61.8	0.33	29.0	30.6	185.4	Clam, barnacle, mussel
SC06	22	1	4.6	0.33	30.6	32.0	13.8	Clam, mussel, barnacle
SC06	23	1	5.1	0.33	32.0	33.3	15.3	Mussel, barnacle
SC06	24	1	27.0	0.33	33.3	35.0	81.0	Clam, mussel, barnacle, nassa
SC07	34	2	16.5	0.33	23.0	25.0	49.5	Clam, barnacle
SC07	35	1	75.9	0.33	25.0	26.2	227.7	Clam, barnacle, limpet, mussel
SC07	36	1	957.1	0.33	26.2	27.5	2871.3	Clam, mussel, barnacle
SC07	37	1	275.7	0.33	27.5	28.7	827.1	Clam, barnacle, mussel, limpet
SC07	38	1	69.7	0.33	28.7	30.0	209.1	Clam, cockle, mussel, barnacle, limpet
SC07	39	1	4.5	0.33	30.7	33.0	13.5	Barnacle, mussel, clam
SC08	188	1	12.6	0.09	15.1	16.0	140.0	Clam, barnacle
SC08	190	1	40.1	0.18	21.5	22.5	222.6	Barnacle, clam, mussel
SC08	191	2	8.8	0.33	30.0	31.7	26.4	Clam, barnacle, mussel
SC08	192	1	15.1	0.33	31.7	34.3	45.3	Mussel, clam, barnacle, nucella
SC08	193	1	30.8	0.33	34.5	35.8	92.4	Clam, mussel, barnacle
SC08	194	1	4.4	0.09	35.8	36.3	48.9	Barnacle, clam, nucella
SC08	195	1	5.1	0.18	36.3	37.6	28.3	Clam, barnacle
SC09	151	1	0.1	0.33	21.8	23.5	0.3	Clam
SC09	152	1	3.9	0.33	23.5	24.8	11.7	Clam
SC09	153	1	9.8	0.33	25.5	27.5	29.4	Barnacle, mussel, clam
SC09	154	1	3.3	0.09	30.0	31.0	36.7	Clam, mussel
SC09	155	1	7.6	0.24	31.0	32.0	31.7	Clam, barnacle, nucella
SC09	156	1	3.1	0.27	32.0	33.5	11.5	Clam, barnacle, burned
SC09	157	1	3.1	0.33	33.5	35.0	9.3	Clam
SC09	158	1	0.1	0.06	35.0	35.5	1.7	Clam, burned
SC10	135	1	7.5	0.15	24.4	25.3	50.0	Barnacle, clam, mussel
SC10	136	1	44.8	0.33	25.3	26.5	134.4	Barnacle, clam, mussel
SC10	137	1	86.3	0.33	27.5	29.7	258.9	Clam, barnacle, mussel, limpet
SC10	138	1	15.8	0.33	30.0	31.5	47.4	Clam, barnacle, nucella
SC11	53	3	1.5	0.18	17.5	18.5	8.3	Mussel, clam
SC11	55	2	0.2	0.15	22.0	22.6	1.3	Clam, barnacle
SC11	56	2	24.5	0.33	22.6	24.0	73.5	Clam, mussel, barnacle
SC11	57	1	13.0	0.30	24.0	25.0	43.3	Barnacle, mussel, clam
SC11	58	2	11.3	0.33	25.0	26.6	33.9	Clam, mussel, barnacle, limpet
SC11	59	1	7.2	0.33	26.6	27.5	21.6	Clam, barnacle, mussel
SC11	60	1	36.0	0.33	27.5	28.6	108.0	Barnacle, clam, mussel
SC11	61	1	15.4	0.33	28.6	29.6	46.2	Clam, mussel, barnacle
SC11	62	1	3.9	0.15	29.6	30.0	26.0	Mussel, barnacle
SC11	63	1	13.8	0.33	30.0	31.3	41.4	Mussel, clam, barnacle

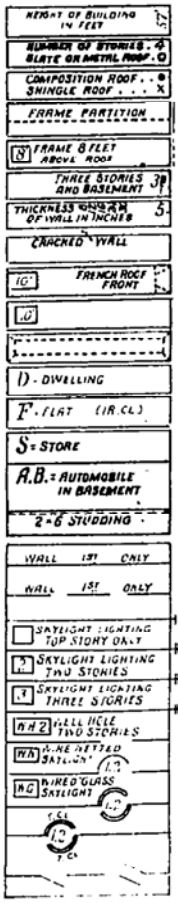
TABLE B-2. SHELL CATALOG.

BORE	BAG	SPEC	WGT (g)	VOL	TOP	BOT	WGT/FT3	COMMENTS
SC11	64	1	4.1	0.12	31.3	31.7	34.2	Clam, mussel
SC11	65	1	6.6	0.30	31.7	32.4	22.0	Clam, barnacle, burned
SC12	68	1	0.1	0.15	2.1	2.5	0.7	Barnacle
SC12	78	1	27.9	0.33	27.5	29.0	83.7	Clam, barnacle, mussel
SC12	79	1	52.0	0.33	29.0	30.6	156.0	Barnacle, clam, mussel
SC12	80	1	66.8	0.30	30.6	32.0	222.4	Clam, mussel, barnacle
SC12	81	1	74.2	0.33	32.0	33.7	222.6	Clam, mussel, barnacle, cockle
SC12	82	1	73.3	0.27	33.7	35.0	271.2	Clam, barnacle, mussel
SC12	83	1	3.2	0.33	35.0	36.7	9.6	Clam, barnacle, gastropod
SC12	84	1	7.3	0.33	36.7	38.0	21.9	Clam, mussel
SC13	209	2	0.1	0.33	7.0	8.5	0.3	Barnacle, clam
SC13	210	3	0.8	0.33	8.5	10.5	2.7	Clam
SC13	214	2	0.7	0.33	22.0	23.5	2.3	Clam
SC13	216	2	0.5	0.33	19.5	21.0	1.7	Clam
SC13	217	1	43.6	0.33	27.5	29.0	145.2	Clam
SC13	218	3	39.4	0.33	29.0	31.0	131.2	Nucella, barnacle
SC13	219	1	0.1	0.33	21.0	22.0	0.3	Clam
SC13	220	1	10.6	0.12	31.0	31.7	89.0	
SC13	221	1	0.6	0.24	31.7	33.3	2.5	Clam, mussel
SC13	222	1	11.1	0.33	33.3	34.5	37.0	Nucella
SC13	223	1	0.1	0.33	34.5	36.3	0.3	Clam, barnacle
SC13	224	1	0.1	0.33	36.3	37.5	0.3	Clam, nucella
SC14	286	1	17.4	0.33	24.5	26.0	57.9	Barnacle, clam
SC14	287	1	34.2	0.18	26.0	27.0	191.5	Clam
SC16	246	2	0.5	0.33	28.4	30.0	1.7	
SC16	247	1	5.1	0.21	30.0	30.4	24.0	Clam, barnacle
SC16	248	1	18.4	0.33	30.4	32.0	61.3	Clam
SC16	249	1	3.1	0.33	32.0	33.3	10.3	Clam
SC16	250	1	22.4	0.33	33.3	34.6	74.6	Clam
SC16	251	1	80.8	0.33	34.6	36.1	269.1	Clam
SC17	170	1	4.2	0.18	17.9	19.1	23.3	Clam, barnacle
SC17	172	1	1.9	0.18	19.6	20.5	10.5	Barnacle, limpet, clam
SC17	173	1	0.1	0.12	21.5	22.2	0.8	Barnacle, limpet
SC17	177	1	2.6	0.15	23.0	23.7	17.3	Barnacle, limpet
SC17	178	1	17.3	0.24	25.1	25.7	72.0	Clam, mussel, barnacle
SC17	179	1	43.9	0.18	25.7	26.4	243.6	Clam, barnacle, mussel
SC17	180	1	27.5	0.18	26.4	27.1	152.6	
SC17	181	1	7.4	0.21	27.1	27.9	35.0	Mussel, barnacle
SC18	107	3	0.1	0.30	5.0	6.8	0.3	Clam
SC18	113	1	4.0	0.21	19.6	21.0	19.0	Clam, barnacle
SC18	114	1	16.9	0.33	21.0	22.7	50.7	Barnacle, mussel, clam, most appear burned
SC18	115	1	114.6	0.33	22.7	23.5	343.8	Clam, barnacle, mussel, limpet
SC18	116	1	112.3	0.33	23.5	25.1	336.9	Barnacle, clam, mussel, limpet
SC18	117	2	12.0	0.09	25.1	26.0	133.3	Barnacle, mussel, possibly burned
SC18	118	1	203.4	0.21	26.0	26.5	968.2	Clam, barnacle, mussel, nucella
SC18	119	2	5.7	0.33	30.0	31.7	17.1	Mussel, clam, barnacle
SC18	120	1	2.1	0.18	31.7	32.0	11.7	Barnacle, clam
SC18	121	1	10.4	0.27	32.0	33.0	38.5	Clam

APPENDIX C: Sanborn Fire Insurance Maps

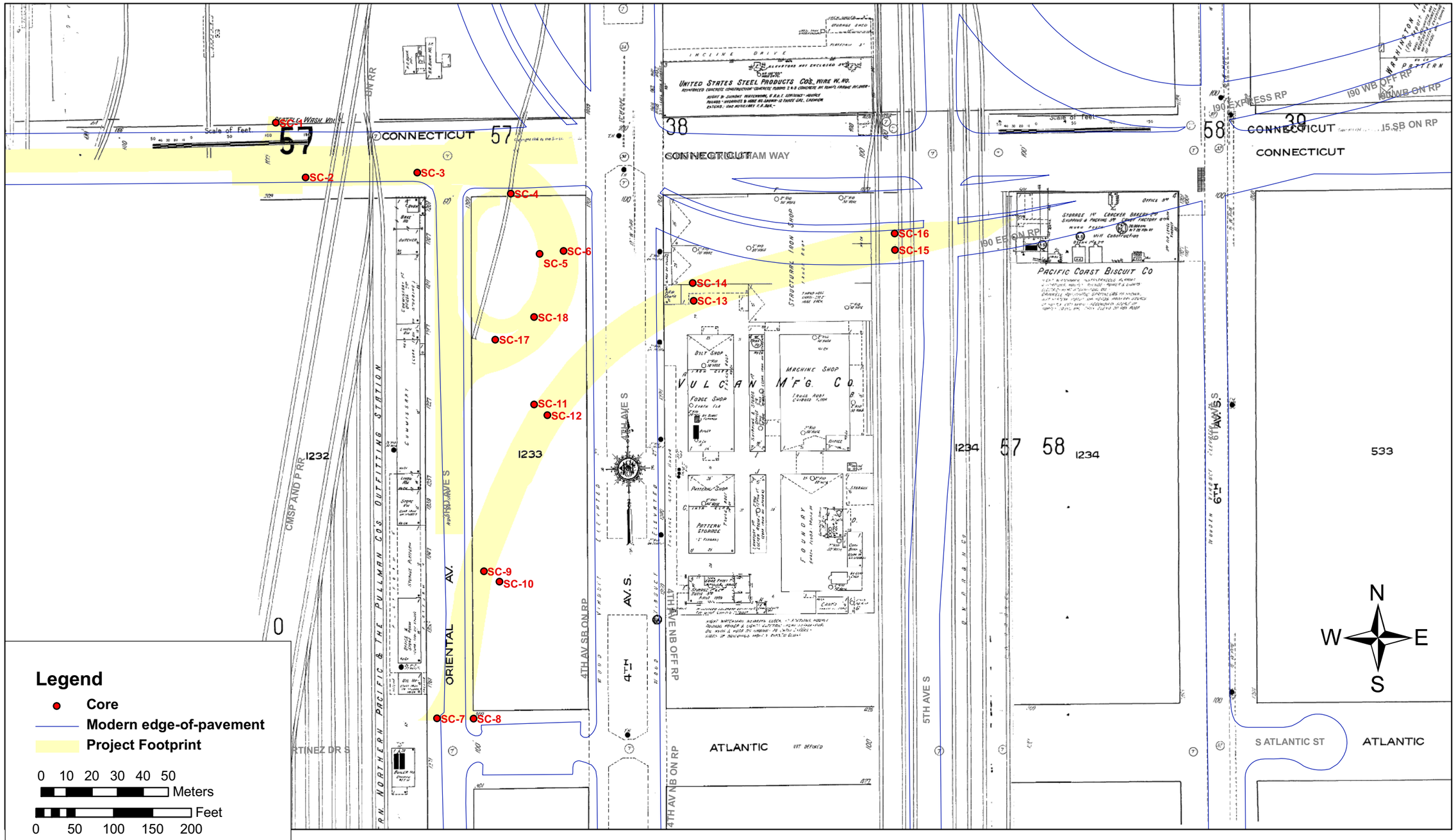
Sanborn Fire Insurance Maps. Digital Sanborn Maps, 1867-1970. The Sanborn Map Company, Sanborn Library,LLC. ProQuest Information and Learning Company. http://sanborn.umi.com/.

KEY



Fire proof construction
Stone, concrete or cement block construction.
Iron bunding
Brick building with brick or metal cornice
" " " frame cornice
" " " stone front
" " " iron front
" " " frame side
House on roof, three sides frame
" " " all sides frame
Brick building with french or mansard roof
Frame building
" " " tar clad.
Brick building adjoining stone building with
party wall
Stone building adjoining brick building with
side of brick building supported by studding.
Wall 1st no opening through it.
" " with openings.
Fire wall 6 inches above roof
" " " 18 " " "
" " " 24 " " "
Unprotected opening in division wall
Opening 1st and 2d with iron door
" " " " " standard steel vault doors.
" " " " " standard tin clad doors.
Openings with wired glass doors.

Linear opening in first story
" " " second story
Windows " " 2d & 3d stories
" " " 2d & 4th "
Windows with iron shutters
Wired glass windows with wooden sash and wooden frames.
Wired glass windows with metal sash and metal frames
HORIZONTAL BRICKED HORIZONTAL NOT BRICKED V.H. 15# VERTICAL Steam boilers.
BRICK IRON Chimneys. S.P. Stove pipe
TC Terra cotta chimney C.B.C. Cement brick chimney
CC Concrete block chimney P.C. Patent chimney
IRON SO'S.A. Iron chimney 50% above roof with spark arrester
(All buildings on which chimney marks are not shown have brick chimneys)
E Open elevator shaft E. Closed elevator shaft
FE Frame enclosed elevator
H Hoist from basement to first floor only.
FA Fire alarm box 6" W.P.P.E. D.H. Water pipes
AS Automatic sprinklers S.HYD. D.C. HYD. Hydrants
FE Fire escape with stand pipe having steamer connection.
VP Outside stand pipe with steamer connection.
FE Fire escape. Stable.
F.P. Force pump.
V.P. Vertical pipe
(15) Elevation.
Reference to adjoining sheet 72
IEP Independent electric plant.
AFA Automatic fire alarm.
✚ Fire enamic house, as shown on key map.
O Fire alarm box, " " " " "



Legend

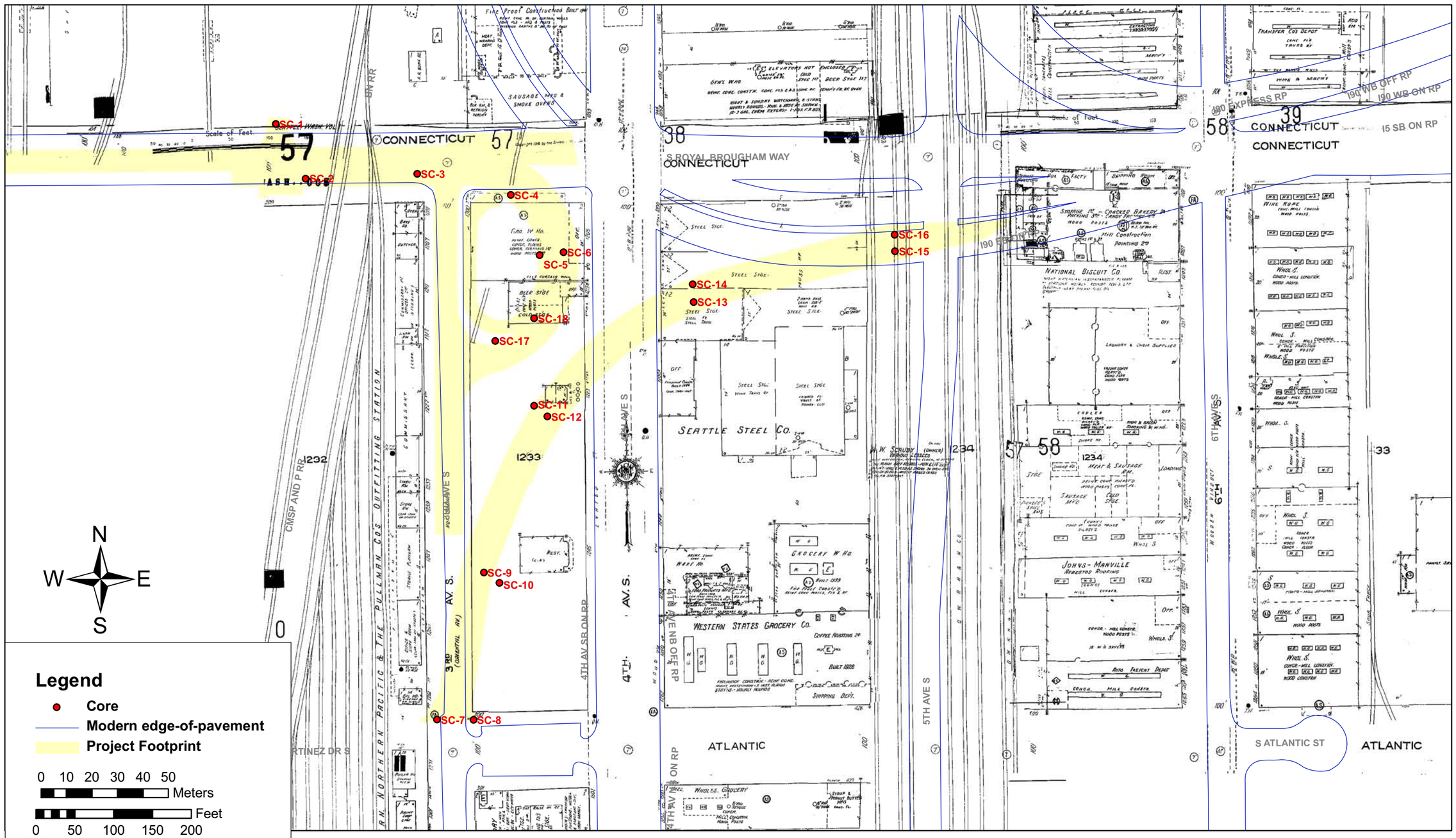
- Core
- Modern edge-of-pavement
- Project Footprint

0 10 20 30 40 50 Meters

0 50 100 150 200 Feet

1:1,500

Map 1. 1916 Sanborn map showing project footprint and core locations.



Map 2. 1950 Sanborn map showing project footprint and core locations.