Alaskan Way Viaduct & Seawall Replacement Program

U.S. Department of Transportation Federal Highway Administration | WSDOT | King County | City of Seattle

CULTURAL RESOURCES STUDY FOR THE SR 99 INTELLIGENT TRANSPORTATION SYSTEM IMPROVEMENTS PROJECT

Submitted to:
Washington State Department of Transportation
Urban Corridors Office
401 Second Avenue S, Suite 560
Seattle, WA 98104

Submitted by:
Archaeological Investigations Northwest, Inc.

Prepared by:
Amy E. Foutch, M.A., Michele L. Punke, Ph.D., R.P.A., Jon Held, M.A., Elizabeth J. O'Brien, B. Arch., and John L. Fagan, Ph.D., R.P.A.

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The Alaskan Way Viaduct & Seawall Replacement Program

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The Alaskan Way Viaduct & Seawall Replacement Program is a joint effort between the Federal Highway Administration (FHWA), the Washington State Department of Transportation (WSDOT), and the City of Seattle. To conduct this project, WSDOT contracted with:

Archaeological Investigations Northwest, Inc.
2632 SE 162nd Ave.
Portland, OR 97236

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1.0 Summary

- One historic resource, temporary ID 08/1686-1, was identified as being 50 years or older and within 61 m (200 ft) of an ITS project work area. AINW recommends that this resource is eligible for listing in the NRHP. The improvements, as proposed will have no effect on this resource.
- No historic or prehistoric archaeological deposits were identified within the eleven tested archaeological High Probability Areas.
- Monitoring of construction activities is recommended for six locations to inspect mechanically excavated sediment for archaeological materials.

1.1 Introduction

The Washington State Department of Transportation has contracted with Archaeological Investigations Northwest, Inc. (AINW), to conduct a cultural resources study in support of WSDOT efforts to improve traffic operations through the installation of Intelligent Transportation System (ITS) support equipment along and near State Road (SR) 99 north and south of downtown Seattle (Figure 1). This work is being implemented in accordance with the Washington State Environmental Policy Act (SEPA), and Washington State's Executive Order 05-05 for projects receiving state funding for capital construction or land acquisition.

This report details AINW's cultural resource investigations which included a review of the cultural context and environmental setting of the project area and a survey and assessment of the historic resources within the project area. Archaeological fieldwork investigations were also conducted in project locations that are slated for construction activities having the potential to impact intact, natural sediments that are within areas with a high potential for containing archaeological resources. AINW conducted background research on the project area in order to develop a full

understanding of the historical context, land use patterns, and previously identified historic and archaeological resources within the project area. AINW performed a geomorphological assessment that considered the origin and evolution of the landforms in the project area and determined the archaeological potential of these landforms where ground disturbing work is planned for the project.

Based on a review of the historic resources within the project area, both previously recorded and unrecorded, AINW determined that there is one historic resource within the project area that is 50 years or older and within 61 meters (m) (200 feet [ft]) of an ITS work location. AINW recorded this resource, the North 46th Street/SR 99 Overcrossing within the right-of-way, and recommends that it is eligible for listing in the National Register of Historic Places (NRHP), but will not be affected by the proposed improvements.

Information gathered pertaining to the cultural and geomorphic context of the project area was used to identify areas with a high potential to contain archaeological resources at locations where ground disturbing work is planned for the project (High Probability Areas [HPAs]). Based on this research, 11 locations were identified for further archaeological testing. These areas are labeled as Locations 1 through 11 from south to north and are located as follows.

- Location 1 (South Section): at the intersection of SR 99 and Tukwila International Blvd.
- Location 2 (South Section): at the intersection of SR 99 and South 102nd Street
- Location 3 (South Section): along SR 99, just south of 17th Place South
- Location 4 (South Section): near the intersection of SR 99 and 14th Avenue South
- Location 5 (Central Section): near the intersection of East Marginal Way and South Brighton Street
- Location 6 (Central Section): at the intersection of East Marginal Way and 1st Avenue South Bridge
- Location 7 (Central Section): near the intersection of SR 99 and South Alaska Street
- Location 8 (Central Section): at the intersection of SR 99 and Diagonal Avenue South
- Location 9 (Central Section): at the intersection of SR 99 and South Idaho Street
- Location 10 (Central Section): near the intersection of SR 99 and South Lander Street
- Location 11 (North Section): at the intersection of SR 99 and North 68th Street

AINW conducted an archaeological survey of these locations in order to determine if subsurface testing for archaeological resources could be performed. In areas where subsurface testing was feasible, shovel tests were excavated to the depth of proposed

construction impacts. Due to modern development and the limitations of hand augering, it was not possible to reach the depth of anticipated construction impacts in six of the locations (Locations 1, 5, 6, 7, 8, and 9). AINW therefore recommends monitoring during construction for each of these locations to inspect mechanically excavated sediments for archaeological materials or deposits.

1.2 Project Area and Potential Effects

The project involves three sections of roadway along SR 99, SR 509, and SR 599 within the City of Seattle, Washington (Figure 1). The Southern Section is located along SR 99, SR 509, and SR 599 for the following limits: SR 599 Mile Post (MP) 0.10 to 1.75 (end of State Route 599 and beginning of SR 99), SR 99 MP 22.97 to 26.8, and SR 509 MP 27.87 ending at the junction with SR 99 MP 26.55 (Figure 2). The Central Section runs along SR 99/East Marginal Way from Ellis Avenue to South Holgate Street (Figure 3), and the Northern Section, extends along SR 99 from the vicinity of Ward Street to North 145th Street (Figure 4). The project area extends to the edge of the existing right-of-way where the only impacts will be at specific ITS improvement locations within each section. The historic resource impact area therefore includes resources that are 50 years or older and are located 61 m (200 ft) or less from the ITS improvement locations within the highway right-of-way.

The ITS improvements scheduled for the Southern Section of the project area include electrical and fiber cabinets, closed circuit television, vehicle detection, dynamic message signs, license plate readers, and installation of 18,288 m (60,000 ft) of fiber optic cable. The fiber optic cable installation is to be performed within the road prism, so this improvement activity is not considered in the archaeological section of this report, as it has no potential to impact intact archaeological resources. In the Central Section, construction will involve the installation of new traffic signal controllers and cabinets, vehicle detection, and a dynamic message sign. The Northern Section of the project area will include installation of new traffic signal controllers and cabinets, closed circuit television, vehicle detection, dynamic message signs, and license plate readers. A list of project improvements and the associated ground disturbance is provided as Table 1.

The figures included with the report provide detailed views of the Southern, Central, and Northern portions of the project area in terms of their geomorphic setting, cultural setting, historic resources, construction locations, and AINW archaeological testing locations. The maps accompanying the discussion of the Southern Section of the project area include Figure 5 (geomorphic setting), Figure 6 (cultural setting), Figure 7 (historic resources), Figure 8 (HPAs and construction locations), and Figures 9 to 12 (AINW testing locations). The maps included for the Central Section include Figure 13 (geomorphic setting), Figure 14 (cultural setting), Figure 15 (historic resources), Figure 16 (HPAs and construction locations), and Figure 17 (AINW testing locations). The figures provided for the Northern Section include Figure 18 (geomorphic setting), Figure 19 (cultural setting), Figure 20 (historic

resources), Figure 21 (HPAs and construction locations), and Figure 22 (AINW testing locations).

1.3 Environmental Setting

The project areas are located in the lowlands of western Washington State extending north-south through the Puget Trough physiographic province (Franklin and Dyrness 1988:16, 17). The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east. The underlying bedrock geology of the Puget Sound area is dominated by Tertiary rock formations, including Eocene basalt formations and flow breccia, and volcaniclastic rock interfingering with marine sandstone and siltstone (Brenniman et al. 2003).

Geologic forces that have shaped and modified the Puget Sound include sea level fall and rise during the last glacial period, actions of the Pleistocene glacial ice masses and outwash flows, isostatic rebound associated with glacial ice mass retreat, river erosion and deposition, volcanic eruption and deposition, and deformation of the land from local and regional fault systems (Troost and Booth 2008). Surficial geologic deposits within Puget Sound primarily resulted from Pleistocene glacial advances and retreats, the last of which was the Vashon Stade of the Fraser Glaciation (Brenniman et al. 2003). Other, more recently emplaced sedimentary deposits include alluvium from the numerous river systems that feed the Sound, ash deposits from regional volcanoes, and ashy alluvium that have flowed down the regional river systems in the form of lahars (Brenniman et al. 2003; Pringle 2005).

The climate of western Washington has experienced several major shifts since the Pleistocene (Orr and Orr 1996; Whitlock 1992). The late Pleistocene glacial and periglacial conditions lasted from about 20,000 to 15,000 years ago. During this time, temperatures were notably colder than they are today. During the Early Holocene (14,500 to 9,500 years ago), the climate was warmer than the late Pleistocene but cooler than today. The Middle Holocene (9,500 to 4,500 years ago) was marked by a climate that was warmer and dryer than the present climate. The current climatic period, the Late Holocene, began about 4,500 years ago.

The contemporary climate of the Puget Trough is generally wet and mild with little in the way of temperature and moisture extremes. Summers are dry and cool as high pressure in the central Pacific diverts storms north. Winter brings cyclonic storm systems that bring steady rain and high winds. The growing season is long and winters often bring little or no frost. Heavy precipitation (800 to 1,200 millimeters [mm] [32 to 48 inches (in)] annually) falls mostly as rain between October and March (Franklin and Dyrness 1988:42). Generally, average annual temperatures rise and annual rainfall declines moving from north to south through the Puget Trough.

As the climate of western Washington has changed since the Pleistocene, so have the flora and fauna (Whitlock 1992). During the Late Pleistocene, the unglaciated portions of western Washington were covered with tundra, grasslands, and scattered

patches of trees. Megafauna such as mammoth and mastodon were present in western Washington. Forests dominated by pines expanded over the area during the Early Holocene. During the warming and drying trend that characterized the Middle Holocene, grasslands and oak savannahs expanded across western Washington. The Late Holocene climate promoted the advance of the vast coniferous forests that cover the region today.

Much of the current native vegetation along the three roadway sections has been clearcut or removed for fields, roads, and other developments but the area is within the Tsuga heterophylla zone (Franklin and Dyrness 1988). This zone consists primarily of Douglas-fir (Pseudotsuga menziesii), western hemlock (T. heterophylla), and western redcedar (Thuja plicata). The region also includes areas with bigleaf maple (Acer macrophyllum) and other deciduous trees as well as two common pine trees, the western white pine (Pinus monticola) and lodgepole pine (Pinus contorta). Riparian vegetation along rivers and streams include trees such as black cottonwood (Populus trichocarpa) and red alder (Alnus rubra), the latter of which is also common in recently disturbed areas.

While most of western Washington was historically dominated by coniferous forests, open prairies were important vegetation communities because they played a vital role in the settlement and subsistence systems of Native peoples (Norton 1979). Most if not all of these prairies were anthropogenic (created by people) and maintained through periodic burning. Prairies featured prized plant resources such as bulbs from common camas (Camassia quamash), acorns from Oregon white oak (Quercus garryana), and hazelnuts from western hazel (Corylus cornuta).

Noteworthy land mammals in the Puget Trough include deer (Odocoileus spp.), elk (Cervus canadensis), black bear (Ursus americanus), coyote (Canis latrans), and mountain lion (Felis concolor). Aquatic environments are home to such mammals as beaver (Castor canadensis), muskrat (Ondatra zibehica), and river otter (Lutra canadensis).

Of paramount importance to Native peoples past and present are the various species of salmon (Oncorhynchus spp.). Among the most common salmon in the Puget Trough physiographic province include Sockeye (O. nerka), Coho (O. kisutch), Chinook (O. tshawytscha), Chum (O. keta) and Pink (O. gorbuscha). Each species of salmon has its own breeding season cycle and preferred habitat, meaning that each drainage has its own relative frequencies of the different species and the seasonality of their passage (Willson 1997).

1.4 Geomorphological Assessment

Geologic mapping of the area within which the project is found was compiled by the Washington Division of Geology and Earth Resources Staff (WDGERS) into 1:100,000 scale geologic maps available online in spatial data format (WDGERS 2005). Refined mapping of unconsolidated and consolidated geologic units was

completed at a 1:24,000 scale by Troost et al. (2005) for the Seattle area. These geologic data sets suggest that the project area is underlain by a complex patchwork of Tertiary bedrock, glacial sediment, alluvium, and modern fill materials. The fill has been placed over the landscape to provide more area for industrial and residential development. More detailed examination of the geology underlying each of the project segments is presented below.

In general, the bedrock of the Puget Trough consists primarily of sedimentary rocks from the Tertiary Period (Orr and Orr 1996). Bedrock outcrops within the project area are primarily Eocene and Oligocene-aged marine sedimentary rocks, nearshore sedimentary rocks, and volcaniclastic deposits (WDGERS 2005). The surficial geology of the project area is largely the result of Pleistocene glaciations. The last advance of a continental glacier through the Puget Trough began approximately 20,000 years ago when the Cordilleran Ice Sheet moved south from British Columbia. By 15,000 years ago, the Puget Lobe of this ice sheet extended some 30 kilometers (km) (19 miles [mi]) south of the present City of Olympia (Orr and Orr 1996). Maximum ice thickness was approximately 303 m (1,000 ft) at Olympia, 909 m (3,000 ft) at Seattle, and 1,515 m (5,000 ft) at Bellingham. At the peak of the last continental glaciation, the world's oceans were approximately 100 to 150 m (330 to 495 ft) lower than they are today. Most soils in the Puget Trough have formed on a thick layer of unconsolidated glacial outwash. In areas where marine or river processes have been active, such as near Elliot Bay or along the route of the Duwamish River, glacial materials have been eroded and alluvium or tidal flat deposits have been emplaced.

1.4.1 Southern Section

The Southern Section of the project area is located within and along the floodplain of the Duwamish River (Figure 5). The surficial geology of the floodplain, within which portions of SR 99, SR 599, and SR 509 are found, is mapped as primarily alluvial sediments that date to the Quaternary Period (WDGERS 2005). The natural course of the Duwamish River, prior to modern human modification, was meandering and included the main river channel, many small sloughs, oxbow lakes, and tributary channels that would have been used by people and wildlife living along the river in the past. Deposition from overbank flooding and other alluvial depositional events would have buried evidence of human occupation at these streamside locations.

Much of the natural course of the river has been infilled during modern and historic periods to create more habitable land in the Seattle area (Figure 5:Qf). Some of the meanders of the Duwamish River, especially in its northern section, were infilled in concurrence with straightening of the river by the US Army Corps of Engineers in the 1930s (Troost et al. 2005). The low, marshy tideflat area near the river's mouth where it meets Elliot Bay was also infilled during historic and modern times. Gravel, sand, silt, concrete, bricks, coal, wood, garbage, and other debris were used as fill materials in the low-lying river channels and tideflats (Troost et al. 2005).

In the Southern Section of the project area, SR 99 and SR 509 are also located on or alongside glacial outwash deposits that were deposited during the Fraser Glaciation, which occurred during the late Pleistocene beginning approximately 26,000 years ago (Orr and Orr 1996). Glacial outwash deposits are the materials deposited by the debris-laden meltwaters that run over, beneath, and away from the glacial ice as it melts. These deposits are generally well-sorted, coarse materials that are easily distinguishable from the glacial till deposits that are also found within the project area. The till deposits are unsorted and unlayered rock debris that is carried and deposited directly by the glacier, rather than the meltwaters. Both of these types of glacial materials would have been deposited well before human occupation of the landscape, as the retreat of the Puget Lobe from the central portion of the Puget Lowland is estimated to have occurred approximately 16,400 years ago (Porter and Swanson 1998). Any evidence of human occupation of these landforms, therefore, would be near the surface and likely would have been disturbed or destroyed during the original highway construction.

Landslide susceptibility studies have used aerial photographs, topographic maps, field based studies, historical records, and remote sensing data to map the extent of affected landscape in the Seattle area (Waldron et al. 1962; Youngmann 1979; Yount et al. 1993; Schulz 2005). Based on these studies, it appears that the central section of SR 509 within the project area has been affected by landslides in the past (Figure 5). Landslide-affected areas include those mapped as landslides, denuded areas (slopes stripped of sediment as a result of landsliding), and headscarps (the upslope edge of the landslide) (Figure 5). Landslide-affected areas were considered low probability areas for this study. This is due to the fact that most landslide-associated areas are on relatively steeply sloping landforms (Schulz 2005), which are less likely to have been used by peoples in the past. In those areas where landsliding has caused sediment to be deposited over relatively low-slope landforms, including areas along the Duwamish River, archaeological materials associated with human occupation of the landscape may have been buried. However, these materials would have been buried under meters of landslide sediment and are therefore unlikely to be impacted by the proposed project's activities in this area which are relatively shallow.

1.4.2 Central Section

As with the Southern Section of the project area, the project route within the Central Section crosses natural alluvial sediment within the Duwamish floodplain as well as modern and historic fill materials that have been used to fill in river meanders and low-lying tidal marshes surrounding Elliot Bay (Troost et al. 2005) (Figure 13). The exact depth of the overlying fill materials in each portion of the project area is not known, so there remains potential for intact sedimentary, and associated archaeological, deposits to underlie the fill. Additionally, some of the material used to fill and build up the low-lying portions of the landscape was placed during the historic-period, so there is the potential for historic-period archaeological sites to be located within the filled-in portions of the project route.

The recently mapped Seattle fault zone crosses the Central Section of the project area (Johnson et al. 1994; Johnson et al. 1999) (Figure 13). The Seattle fault zone is a series of west-trending, south-dipping reverse faults. Slip along the faults is thought to average approximately 0.7 to 1.1 mm (0.03 to 0.04 in) per year (Johnson et al. 1999:1052). The last earthquake to occur along the fault zone was approximately 900 A.D. and resulted in widespread uplift of portions of the land of approximately 5 to 7 m (16 to 23 ft) (Bucknam et al. 1992). Seismic profiles collected from Elliot Bay, however, suggest that the effect on geological formations from deformation of the Seattle Fault Zone may have been minimal in the Duwamish River Valley and the Elliot Bay area (Johnson et al. 1999:1046).

1.4.3 Northern Section

The Northern Section of the project area crosses over glacial deposits, including till, drift, and outwash, that were deposited during or before the last glacial period, prior to 16,400 years ago (Porter and Swanson 1998). Green Lake (formerly Glacial Lake Russell), positioned near the center of the Northern Section, formed during the recession of the Vashon glacier in a former subglacial trough interconnected by recessional streams (Sylvester and Anderson 1960; Troost and Booth 2008). Humans and animals may have used this lake for fresh water in the past. However, any evidence of human occupation on or around these glacial landforms would be near the surface and likely was disturbed or destroyed during the original highway construction. Areas along the inlet to Elliot Bay may have been used by humans more extensively during the Holocene period and may have been buried under thick intertidal sediments during Holocene sea level rise. However, these areas are located many meters below the actual route of SR 99 and will not be impacted by the proposed project.

1.5 Regional Cultural Setting

1.5.1 Cultural Chronology

The following discussion is based primarily on the Northwest Coast regional overview by Ames and Maschner (1999) that covers coastal areas west of the Cascade Range from Alaska to northern California. Much of this background was originally reported in Smith et al. (2004) and is summarized below.

Although there is archaeological evidence of a human presence on the Northwest Coast dating to at least 11,000 years before present (BP), sites more than 5,000 years old are relatively rare (Carlson 1990:60; Rice 1985; Wessen 1990). In western Washington, wet climate, active hydrological landscapes, and vigorous plant growth have been detrimental to preservation and the discovery of ancient archaeological deposits. Paleoindian (10,500 B.C. and earlier) evidence in the region is limited to six isolated finds of distinctive fluted Clovis-style projectile points in the Black Hills and Chehalis River Valley areas west of Olympia, on the campus of Pierce College southeast of Tacoma, in a peat bog at Maple Valley, in a garden on Whidbey Island,

and at Gig Harbor (Avey n.d.; Meltzer and Dunnell 1987; Osborne 1956; Rice 1985; Alan Spencer personal communication 1998). Although it is impossible to date these isolated finds, it is estimated that they are between approximately 11,200 and 11,000 years old. Based on evidence from Clovis sites throughout North America, these early people practiced generalized hunting and gathering; they were highly mobile and relied upon hunting large game for subsistence, supplementing their diet by hunting smaller game as well as through the gathering of wild plant foods (Ames and Maschner 1999:66; Carlson 1990:60).

The term "Archaic" is used by many archaeologists to refer to a mobile, broad spectrum hunting, fishing, and gathering economy that characterizes the early Holocene (10,500 to 4400 B.C.) in many parts of North America. Regional variants are now known as the Cascade Phase in eastern Washington (Leonhardy and Rice 1970) and the Olcott Complex in western Washington (Kidd 1964).

The type-site for the Olcott Complex is located near the South Fork Stillaguamish River above the mouth of Jim Creek (east of Mount Vernon). Although the Olcott site has not been dated, other Olcott Complex sites from western Washington and southwestern British Columbia date from 7700 to 2700 B.C. (Stilson and Chatters 1981:17). Olcott sites are typically large and located on elevated landforms; they contain large bifacial tools, unifacial scrapers, and flaked cobbles primarily made from basalt or dacite; features or hearths are rare as are ground stone tools. Site functional types include alluvial cobble quarries, hunting camps, residential bases, and processing locations (Stilson and Chatters 1981; Wessen 2001).

In the mid Holocene (4400 to 1800 B.C.), climate became cooler and wetter and oceans rose to approximately modern levels. These changes produced environments similar to those we know today in the Pacific Northwest and prehistoric people adapted to use of the resources associated with temperate rain forests and productive fisheries. This time period is termed the Early Pacific Period.

Early Pacific Period technological adaptations reflect a shift in subsistence towards an emphasis on marine mammals, fish, and shellfish indicated by a diversity of bone and antler tools including barbed points for harpoons. Wood working tools during this period include ground stone celts and mauls and ground slate projectile points also appear which may have been used to dispatch harpooned sea mammals. Increasing sedentism is indicated by the ubiquity of shell middens as well as the appearance of cemeteries.

The Middle Pacific Period (1800 B.C. to A.D. 200/500) is marked by the introduction of plank houses and plank-house villages, evidence for the accumulation of wealth, and social inequality. These are characteristics that would continue into the historic-period. Storage pit features at some sites indicate that food storage was important. Intensification of salmon fishing corresponds with the appearance of girdled and perforated net sinkers and fish weirs.

Archaeological data suggest the Late Pacific Period cultures (A.D. 200/500 to A.D. 1775) were similar to those observed in early historic times. Populations may have peaked at about A.D. 1000. At the same time, changes in mortuary practices signal broader cultural changes. Seattle area sites near the current project area such as Duwamish No. 1 (45KI23) and Allentown (45KI431) were occupied from the Late Pacific Period to historic times. These sites were used for salmon fishing, wapato processing, and a variety of other subsistence activities (Lorenz et al. 1976; Lewarch et al. 1996).

The Modern Period begins with the approximate time of the first smallpox epidemic to affect Native people on the Northwest Coast (A.D. 1775). Historic-period accounts by non-Indians describe the people of the region during the early Modern Period, but information from Indian accounts and from archaeology is also available.

1.5.2 Ethnography

The project area is situated within the traditional use area of the Southern Coast Salish. In particular, the Duwamish, one of several groups who spoke a Southern Lushootseed language, traditionally resided along the Duwamish River which empties into Elliott Bay in modern Seattle, in the vicinity of the central and southern portions of the project area. Although considered primarily a saltwater group, the Duwamish may have used areas as far inland as Lake Sammamish and reportedly traveled up the Cedar River to cross over the Cascade Range to the Columbia Plateau area (Baenen 1981:457-459). Duwamish villages were historically located on Elliot Bay, the Duwamish River, the Black River, the Cedar River, the Green River, Lake Washington, Salmon Bay, Lake Union, the Sammamish River, and possibly Issaquah Creek (Waterman 1922). In general, the Duwamish were very attached to the river which they used extensively both for food but also transportation.

Individual groups within the Southern Coast Salish area can be characterized by differences in specific settlement and subsistence patterns, geographic distribution, language, social organization, religious beliefs, and ritual behavior. Among the Duwamish, there were some internal divisions based on geography (for example, the people of the Lake Washington villages were considered different from the Duwamish on the river to the west), and groups such as the Sammamish and the Green and White river bands were sometimes lumped together with the Duwamish (Hilbert et al. 2001:45-50; Indian Claims Commission 1957:48; Ruby and Brown 1976:82-83; Smith 1940:16-17). For the people of the Puget Sound area in general, local groups were distinguished by whether they lived on the water ("saltwater" peoples) or inland/upriver (Smith 1940:29-30). There were usually no well-defined boundaries between these groups, and differences were largely subsistence-based.

Fish, particularly salmon (all five species), dominated the diet of the Duwamish and villagers generally maintained fish weirs along the river. Other coastal resources including shellfish such as clams and crabs, sea mammals such as seals, and water fowl, which also comprised a large part of the diet of those living near the water.

Terrestrial resources such as blacktail deer and elk were important resources during the times of the year when salmon were not as plentiful as were sprouts, berries, nuts, roots, and bulbs (particularly wapato). Large game was generally hunted with bows and arrows although several other hunting techniques were also employed including the use of pitfalls, nets, and snares, although the Duwamish did less of this than those people situated in the upriver areas.

Although their winter villages were situated along the water's edge, the Duwamish also had seasonal camps where additional resources could be gathered during the summer months. Shellfish were often gathered along the eastern shoreline of Puget sound between Alki point and Mukilteo and terrestrial plant and animal resources were found in the surrounding uplands (Larson 1993). A bilateral kinship system offered numerous opportunities to cross local cultural boundaries to access resource areas. Marriages between villages and different groups were frequent and helped to reinforce extensive kin networks among families. There were few—if any—groups in this region that were traditionally "tribes" in the sense of a group with a shared name and identity, occupying several settlements in a specific geographic area, and with a common political leadership.

Southern Coast Salish society was divided into upper class, lower class, and slaves with higher status being attained through birth and wealth accumulation. There were no leaders with formal authority but senior members of wealthy kin groups and households exercised considerable influence and were often treated as village "headmen" whose role consisted of settling disputes and sponsoring feasts and potlatches. Likewise, individuals with special skills usually took the lead in specific tasks, although the leadership role would end when the task was completed. In general, qualities such as generosity, skill at public speaking, the ability to arbitrate disputes, and being even-tempered were admired and could gain an individual respect and influence within society (Hajda 1990:510-511; Lane 1973:8; Smith 1940:47-55; Suttles 1990:464-465; Suttles and Lane 1990:494-495).

Almost all groups on the Northwest Coast occupied large houses typically constructed of cedar planks, with villages typically consisting of one or more houses. These "plankhouses" were occupied by one or more families that formed a single household. The houses of elite households could be much larger, and wealthy individuals sometimes built very large potlatch houses in which the potlatch ceremonies were conducted and guests at the potlatch were housed (Hajda 1990:508-509; Silverstein 1990:537-538; Suttles 1990:462; Suttles and Lane 1990:491).

Southern Coast Salish villages were occupied primarily in the winter, with only the elderly, the disabled, and very young children remaining in the village throughout the year. From early spring to late fall families, households, and task groups left the village for days or weeks at a time to move to seasonal resource locations. At the seasonal camps, resources were gathered and processed. People would occasionally return to the winter village to cache foods and other goods for winter consumption and use. Even villages located close to good fishing areas might have been

abandoned for periods during the fishing season as different runs of salmon could be found on other drainages. The primary means of travel and transportation was by water but overland travel was often necessary to access more interior and mountainous areas (Amoss 1978:7-8).

The absence of tribal identity or strong political leaders and the shifting character of kin ties and village residence made it difficult for even the most observant Euroamericans to define or distinguish specific groups of Native peoples at the time of Euroamerican contact or in the early years of Euroamerican settlement. Anthropologist T. T. Waterman, who worked with Puget Sound peoples in 1918-1920, wrote (Hilbert et al. 2001:14-15):

> A number of "tribal" names are used in this area, which have really very little meaning for the ethnologist. Without exception, they are local place names. Some of them with an added suffix meaning "dwellers at such-and-such a place." Culturally, I find nothing of importance to distinguish one group from another. The linguistic differences [that] there are remains the points of most interest for the student. These have never been worked out in detail. The impression I have is of a number of local groups, each with minute differences in dialect, those differences becoming more noticeable, the greater the distance between groups. Under the circumstance, it is an extremely difficult matter to speak of boundaries.

The nature and quality of traditional life was significantly significantly altered as Native peoples came in contact with Euroamericans in the late eighteenth century. Even before direct contact was established, the Euroamerican conquest of the American Southwest and eastern North America was felt in the Pacific Northwest through several waves of epidemics, especially smallpox beginning in the 1770s with outbreaks continuing at regular intervals after that. Other European diseases such as malaria, measles, and influenza appeared in the early 1800s and became more common as American settlement reached the region in the 1840s. Research by Boyd (1990) has indicated that mortality of 30% or higher was common from these epidemics, reaching 95% or greater in some areas. Boyd (1990:145-146) has estimated that the Native population of the Puget Sound area declined from about 30,000 prior to Euroamerican contact to about 15,000 by 1820 and 10,000 by 1870.

The maritime fur trade developed along the Northwest Coast in the 1780s and 1790s, introducing many items of European and American manufacture ("trade goods") to people of the region. Initially in greatest demand were goods such as clothing, blankets, glass beads, pots and kettles, and firearms, most of which were considered prestigious items by Native groups and tended to be acquired primarily by high-status individuals.

The absence of any centralized authority in Native groups in the Pacific Northwest was challenging to American governmental and military officials seeking to resolve

disputes and negotiate treaties in the 1850s. George Gibbs, an advisor to Washington Territorial Governor Isaac Stevens either directed the Indians to designate chiefs or he personally appointed chiefs and sub-chiefs. It was with a variety of "chiefs" and "sub-chiefs"—some being leaders recognized by their people, and others being designated as such by Stevens and his agents—that Stevens negotiated a series of treaties in 1854 and 1855. Three treaties were negotiated with most of the Native groups in western Washington and were intended to both formally cede Indian title to lands in western Washington and to address growing Indian resentment with the spread of White settlement in the region. The Duwamish people, along with those in the surrounding area, were included in the Point Elliot Treaty of 1855.

At the treaty negotiations, Chief Seattle (for whom the city is named) represented both the Suquamish and Duwamish, and was the main signatory for these groups along with three Duwamish sub-chiefs. Under the terms of the treaty, the Duwamish were to be given payment, education, medical services, and hunting and fishing rights to traditional resource-gathering areas in exchange for their relocation to the Port Madison Indian Reservation. Many refused to be moved and remained in their homeland in the Duwamish drainage system. Some Duwamish eventually settled on the Muckleshoot Reservation but most continued to live in their traditional territory despite White settlement and development that displaced them from many of their villages and fishing locations. In 1910, the Duwamish not living on reservations established a governmental structure to maintain a distinct identity and initiated efforts for federal recognition of the on-reservation Duwamish. The Duwamish Tribe has yet to be recognized by the federal government (Baenen 1981:461; Green 2001; Indian Claims Commission 1957:37).

1.5.3 Euroamerican History

The first well-documented explorations in the Northwest date from the 1770s, when several explorers from England and Spain visited the region and conducted scientific surveys. When Captain James Cook from England surveyed various harbors along the west coast on his third voyage in 1776, he made the earliest reliable maps of the region. The promise of sea otter pelts sparked the commercial interests of European and American investors and led to the opening of the Northwest for fur exploitation (Ficken and LeWarne 1988:8-12; Scott and Turbeville 1983).

Beginning in about 1810, American and Canadian fur companies established posts to exploit more interior fur sources. These posts were the first Euroamerican settlements in the region. By the 1820s, the fur trade was almost entirely in the hands of the Hudson's Bay Company (HBC), and the HBC remained the dominant Euroamerican presence in the region until the 1850s. The HBC found its control of the Pacific Northwest complicated by the arrival of Catholic and Protestant missionaries during the 1830s and 1840s. The missionaries intended to convert the Native population to their respective religions. The arrival of large numbers of

American settlers in Oregon's Willamette Valley after 1843 increased the pressure on the British HBC to withdraw from the region

The first organized American party to reach Puget Sound occurred in 1844 when two men settled at a location on the south end of the Sound at the Deschutes River falls at present Tumwater near Olympia (Ficken and LeWarne 1988:21-22). Several American settlements subsequently appeared on harbors and river mouths around Puget Sound in the early 1850s. Other settlements in the 1850s followed the establishment of the Oregon Territory in 1848, which gave inhabitants legal claim and rights, and the passage of the Donation Land Act by Congress in 1850 (Ficken and LeWarne 1988:14-17; Kirk and Alexander 1995:323).

In the fall of 1851, a group of settlers known as the Denny Party built cabins at Alki Point on Elliot Bay and began selling timber to California-bound vessels. The group soon crossed the bay to a more protected site into what is now downtown Seattle on a lowland area indented with saltwater shorelines and lakes. The location of Seattle as selected by these pioneers was opportune; on one side was a deep harbor with access to the Pacific Ocean and on the other was Snoqualmie Pass and eventual access to the vast interior region. Until the late 1870s, there were almost no bridges, necessitating the use of ferry scows and small steamers to maneuver between flagstops and cities on Puget Sound (Malowney 2002).

At the time of initial settlement, Washington was part of a vast area called the Oregon Country. In 1852, a draft memorial was sent to the US Congress calling for the division of the Oregon Country at the Columbia River. During the closing days of the 1853 Congressional term, a territorial bill was presented and the name of the new territory north of the Columbia River was chosen as Washington. Congressional approval of the Washington Territory was strong due to the government's desire to bring stability and control to the region. The maritime importance of Puget Sound was noted and there was interest in building a transcontinental railroad to the Pacific Northwest (Johansen 1967:248). Olympia became the site of the first Customs House on Puget Sound and because it was also the largest settlement by 1853, it was the likely choice for the territorial capital.

By the end of the 1800s, Washington proclaimed a higher percentage of foreign-born residents than did the United States as a whole. Many of the foreign immigrants arriving before 1900 came from Northern Europe, specifically Scandinavia, Great Britain, and Germany. Large numbers of Chinese also arrived to work on the railroads and in the salmon canning industry.

The early economy in the Seattle area was focused on lumber. At the start, logging activities were mainly confined to the Puget Sound area. However, increased demand during the California Gold Rush stimulated a new demand for timber, and more remote timber stands began to be opened up as new technology allowed. By the mid to late nineteenth century a large fleet of vessels stationed on the Sound carried lumber to all parts of the world (Office of Archaeology and Historic

Preservation [OAHP] 1989:78-80). Additionally, the construction of several railroad lines during the late nineteenth century facilitated transport of goods not only through Washington but to the rest of the country, which kept the timber business booming. These lines included The Northern Pacific Railroad, which was the first major common-carrier to enter the region, the Great Northern Railroad, which finished its transcontinental route between St. Paul and Seattle in 1893, and the Chicago, Milwaukee, and St. Paul (Milwaukee Road) Railroad which connected the Midwest with the Puget Sound area in 1909 (Robertson 1995; Kirk and Alexander 1995).

Between 1905 and 1938, Washington was the nation's leading lumber producer and the largest sawmills and shingle mills on the Pacific Coast were located in western Washington. Today, countless tall stumps and railway grades bear witness to the historic-period logging boom (OAHP 1989:78-80; Whitfield 1926:362).

Washington's mineral resources also played a major role in the regional economy. Gold, silver, copper, coal, and iron were the major products of this subsurface wealth. In the 1850s, gold strikes in the Cascade Range along the rivers and creeks attracted miners to work the placers. Some of the largest coal mines in the state were located in King, Pierce, Kittitas, and Lewis counties (McCarty 2003; OAHP 1989:81-89). Additionally, the Klondike gold rush beginning in 1896 drove a slew of miners to the Yukon, from which Seattle benefitted greatly due to its strategic location as a supply and transportation center.

With the outbreak of World War I, King County increased its production of lumber, manufacturing, shipbuilding, and coal-mining operations. King County had a booming economy immediately following World War I, but the lumber products industry declined by the 1920s while the dairy industry rose to national prominence. Local packers produced eggs, poultry, and canned fruits and vegetable for national and world markets. King County agriculture fared better than other counties during the Depression, although the size and value of farms decreased. Immigration was high in the 1930s, when people were attracted to new industries. Even before the outbreak of World War II, an increasing number of defense contracts helped to stimulate local industries. The county was still prominent in vegetable growing in the 1950s. The success of Boeing's military and commercial aircraft designs helped the company to attain their present leadership position in the commercial aviation and aerospace field (King County Landmarks and Heritage Program 2004).

1.6 Project Area Background

Although the founders of Seattle viewed the city's protected location as fortuitous, it presented several difficulties for permanent settlement in the decades following Seattle's inception. Not the least of these was the fact that downtown Seattle was perpetually flooding during high tide because of its low elevation and precarious location between Denny Hill to the north and First Hill and Beacon Hill to the south and southeast (Sale 1978). The drastic elevation change between the city center and

these hills also made train and horse travel particularly difficult. When R. H. Thomson was appointed as the city's engineer in 1892, one of his main goals was to raise the city out of its "pit" (Klingle 2007). Thomson developed a plan that included a major re-grading of Seattle's hills to build a level, solid landscape and the creation of new waterfront property to which the city's primary shipping businesses could relocate. Although several re-grade projects had taken place before this, none had been on the city-wide scale envisioned by Thomson. Beginning in 1898, the engineer oversaw nearly sixty re-grade projects to rebuild the city, finally ending with the conclusion of the Denny Hill re-grade in 1930 (Berner 1991; Klingle 2007; Sale 1978).

The goal of the re-grades was not only to lower the elevation of some of Seattle's large hills, but also to fill in the tide flats in southern Elliott Bay, where the majority of the central portion of the project area is located. To accomplish this, engineers used hydraulic cannons fueled with water from the re-routed Cedar River to erode away hills (and sometimes the structures situated on top of them). Most of the areas to be graded were considered the slums of the town and were generally garbage-filled areas in which Native peoples as well as European and Asian immigrants squatted in order to attain fishing access to the bay. To Thomson, the infilling of the flats served the dual purpose of creating more industrial space, and cleaning up what he saw as the less desirable parts of the city (Klingle 2007; Sale 1978).

A portion of the removed sediment, especially from hills to the north of downtown, went directly into Elliott Bay to be diffused by the tides. In the tide flats south of downtown, however, walls and levees were constructed to capture the sediment being sluiced off the hillsides. Fill sediment directed into the tide flats was created from several re-grade projects to the south and southeast of downtown. The first and largest of these was the Jackson Street Regrade in which sediment from the hill at Ninth and Jackson was used to fill the northern half of the tide flats westward to Alaskan Way and southward to Lander Street, near Location 10 within the current project. The re-grade lasted from 1900 to 1910, during which time the top of the Jackson Street hill was cut by nearly 27 m (90 ft) (Klingle 2007). Projects filling the southern half of the flats included the South Canal Regrade in 1901, in which sediment was removed during the building of a canal connecting Puget Sound and Lake Washington, and the Dearborn Street Regrade, in which the northern portion of Beacon Hill was sluiced down to build Dearborn Street between 4th Avenue and Ranier Avenue (Sale 1978). In total, twenty seven new city blocks were created during this process spanning east-west from Airport Way to the modern East Waterway. By 1910, the majority of the tide flats were filled and ready for purchasing and building. As developers started placing tracks and foundations in this area and the fill sediment subsided, builders began to realize that the reclaimed tide lands were somewhat unstable. However, waterfront property was cheap, and companies continued to develop despite stability problems. By the beginning of World War I, the railroads and their land companies had bought the majority of the best properties to use for docking and shipping, creating today's Industrial District (Klingle 2007; Berner 1991).

At the same time that sluiced sediment was being used to create a new waterfront in southern Elliott Bay, the Duwamish River, along which the eastern half of the southern portion of the project area is located, was also being reconstructed. Prior to this era of city-wide renovation, the Duwamish River was a relatively slow, meandering river along which small farms flourished. Crops grown in the river's floodplain included hops and a variety of fruits and vegetables. Settlement in the valley grew steadily during the late nineteenth century as it became an agricultural center and communities along the river, such as South Park and Georgetown, were incorporated. By the turn of the century, truck farming had begun to be more popular in the area, and small family farms gave way to larger productions.

Despite its rich soils, the winding Duwamish drainage had several problems which prompted city engineers to campaign for a major reconstruction at the head of Elliot Bay in the late nineteenth century. First, the river flooded constantly; second, the river was so windy and long that it significantly limited the volume of water traffic, thereby limiting the movement of crops and other goods to Elliott Bay for shipping (Carlson 1950). To address these issues, the city proposed the construction of a straight, wide river channel that was designed not only to create room for barges and other ocean-going vessels, but to permit highways to be more easily built around the waterway, and in doing so lay the "foundation for the creation of a great industrial harbor" (Zahler et al. 2006:8). Although residents along the Duwamish were initially hesitant, a particularly severe flood in 1906 spurred the approval of the proposed commercial waterway district in 1909 (Klingle 2007). The resulting Duwamish Waterway project shortened the length of the river by almost 16 km (10 mi) by removing the bends in the river to create a wide, straight channel to reach the bay. Along with dredging and rerouting the water channel, engineers used the dredged sediment to replace the estuaries at the river's mouth with Harbor Island. The island split the east and west channels of the river, and at 350 acres, became the largest artificial island that had ever been built at that time (Klingle 2007; Carlson 1950). The majority of the project was completed by 1920, and the landscape around the river quickly changed as industrial facilities moved in to access the now-travelable channel. Instead of being lined by farms and suburban towns such as South Park and Georgetown, the river's edge was now dominated by shipyards, mills, meat and fish packers, and auto and aircraft manufacturers, reflecting a permanently shift in the focus of the Duwamish economy (Berner 1991; Klingle 2007; Sale 1978).

1.7 Previously Recorded Cultural Resources

AINW conducted a background review and literature search of the SR 99 ITS Improvements Project area. Records from the Washington Department of Archaeology and Historic Preservation (DAHP), the WSDOT, the City of Seattle, and King County, were examined to determine whether historic buildings or structures or archaeological resources had been previously recorded in the project area. These documents were also examined to determine if any properties listed in the NRHP were in or near the proposed project. Historical maps, and published

primary and secondary sources, on file at AINW and online, were also reviewed to develop a list of known historic above-ground or archaeological resources within the project area.

1.7.1 Previously Recorded Historic Resources

The information collected pertaining to the historic built environment includes historical resources that are listed in the NRHP, and designated City of Seattle or King County landmarks. Previous DAHP and City of Seattle resource surveys were reviewed for NRHP eligibility determinations. Information found in previous environmental reports regarding potential historic resources in the project area was also reviewed. The developmental history of the project area, found in standard works of history, university theses, and similar sources, assisted in the identification of potential historic resources.

Listing in the NRHP requires that an historic resource be at least 50 years old, have historical or architectural significance, and retain its original character and integrity. Designation as a City of Seattle landmark requires that the resource be at least 25 years old, and that it retains sufficient integrity to convey its significance (SMC 25.12.350). An historic resource may be designated as a King County landmark if it is more than forty years old or, in the case of a landmark district, contains resources that are more than forty years old (KCC 20.62.040). The resultant table of historic resources is organized from south to north (Table 2).

1.7.1.1 National Register of Historic Places

Three historic buildings or structures within the project area are listed in the NRHP (Table 2), and are also included in the Washington Heritage Register; these are summarized below:

- The Aurora Avenue (George Washington Memorial) Bridge over the Lake Washington Ship Canal (Figure 20). The Aurora Avenue Bridge, constructed between 1929 and 1932, is one of Seattle's longest and tallest spans. It provided an important early crossing of the Lake Washington Ship Canal for motorists on western Washington's north-south motor route, the Pacific Highway (Hadlow 1993:1). The bridge linked Seattle's business center with the expanding residential neighborhoods to the north. Nearly 915 m (3,000 ft) long, the Aurora Avenue Bridge became the second longest cantilever in the state, outdistanced only by the Longview Bridge, which was completed in 1930 (Hadlow 1993:3). The Aurora Avenue Bridge was the first Seattle bridge to be constructed without street car tracks – "a tangible result and affirmation of the emerging dominance of the automobile in the city's transportation network" (Soderberg 1980). The bridge was listed in the NRHP in 1982. Since the distance of this resource from an ITS work location exceeds the 61 m (200 ft) impact area threshold, the resource will not be considered further in this report.

- The Lake Washington Ship Canal (Figure 20) and the associated Chettenden Locks "opened up a vast fresh-water harbor to ocean-going vessels and thus complimented Seattle's deep-water port facilities in Elliott Bay" (Potter 1977:7 1). The project was conceived and planned over a period of years among public and private entities. Operated by the U.S. Army Corps of Engineers, the locks were dedicated in 1917, although the first ship passed through in August of 1916. The locks were named for U.S. Army Major Hiram Martin Chittenden, the Seattle District Engineer for the Corps of Engineers from April 1906 to September 1908. The entire system was listed in the NRHP in 1978. Since the distance of this resource from an ITS work location exceeds the 61 m (200 ft) impact area threshold, the resource will not be considered further in this report.

- The Wagner Houseboat, or "The Old Houseboat," is the third historic resource listed in the NRHP (Figure 20) (Wagner 1980:2). The houseboat is presently moored at the base of the Aurora Avenue Bridge in the northwesterly portion of Lake Union. The Wagner Houseboat is one of very few intact examples of Seattle's earliest floating homes. At their peak, over 1,200 houseboats resided on Seattle's waterways. The Wagner Houseboat was built prior to 1912 as a summer home on Lake Washington and was towed to its present location sometime thereafter. The houseboat was listed in the NRHP in 1982. Since the distance of this resource from an ITS work location exceeds the 61 m (200 ft) impact area threshold, the resource will not be considered further in this report.

1.7.1.2 DAHP Inventory Forms

The literature review and records search indicated that several previous archaeological and historic resource surveys had been conducted within the current project area. Nine historic resources within the study area, but outside of the project impact area, have been recorded on DAHP inventory forms (Table 2). The nine historical resources are summarized below:

- The Northern Pacific Railroad belt line (Westlake Avenue North), circa 1912, was recorded in February 2000 on a Washington State Archaeological Site Inventory Form (Figure 20). The site was determined not eligible for listing in the NRHP. The railroad has since been demolished and no ties, rails, trestle, or berm remain in place. Since the distance of this resource from an ITS work location exceeds the 61 m (200 ft) impact area threshold, the resource will not be considered further in this report.

- The North 41st Street SR 99 Undercrossing Pedestrian Bridge, circa 1935, is a poured-in-place concrete structure that was recorded in February 1979 (Figure 20). No NRHP determination of eligibility has been provided.

- The North 50th Street SR 99 Overcrossing, circa 1935, is a poured-in-place concrete structure that was recorded in 1979 (Figure 20). No NRHP

determination of eligibility has been provided. Since the distance of this resource from an ITS work location exceeds the 61 m (200 ft) impact area threshold, the resource will not be considered further in this report.

- The Woodland Park Pedestrian Bridges, circa 1935, includes three individual structures within Woodland Park at MP 35.77, 35.88, and 35.99 (Figure 20). All of these are poured-in-place concrete structures that were recorded in 1979. No NRHP determination of eligibility has been provided. Since the distance of this resource from an ITS work location exceeds the 61 m (200 ft) impact area threshold, the resource will not be considered further in this report.

- The 63rd Street SR 99 Overcrossing, circa 1935, is a poured-in-place concrete structure that was recorded in 1979 (Figure 20). No NRHP determination of eligibility has been provided. Since the distance of this resource from an ITS work location exceeds the 61 m (200 ft) impact area threshold, the resource will not be considered further in this report.

- The North 102nd Street Pedestrian Bridge, date unknown is a concrete arch pedestrian bridge on concrete piers (Figure 20). The resource was recorded at an undetermined date. No NRHP determination of eligibility has been provided. Since the distance of this resource from an ITS work location exceeds the 61 m (200 ft) impact area threshold, the resource will not be considered further in this report.

- The North 130th Street Pedestrian Bridge, circa 1963, is a concrete-girder- and slab pedestrian bridge on concrete piers. This resource was recorded in July 1979. No NRHP determination of eligibility provided. The distance of this resource from an ITS work location is within the 61 m (200 ft) impact area threshold, however, the resource is not 50 years or older, therefore the resource will not be considered further in this report.

1.7.1.3 Historic Districts, City of Seattle Landmarks, King County Landmarks

AINW verified all local, state, or national historic district boundaries, and identified all districts determined eligible for, or listed in, the NRHP, as well as City of Seattle-designated landmarks in the project area. The project area does not fall within any designated historic districts and does not contain any City of Seattle or King County Landmarks.

1.7.2 Previously Recorded Archaeological Resources

In addition to identifying historic resources, AINW conducted a literature search and reviewed records from the Department of Archaeology and Historic Preservation (DAHP) to determine if archaeological sites had been recorded or if archaeological surveys had been conducted within the vicinity of the proposed SR 99 ITS Improvements Project area. General Land Office (GLO) maps from the Bureau of

Land Management and other historical maps and published secondary sources, on file at AINW, were examined to determine the likelihood of prehistoric or historic resources being in the project area.

Of particular importance to the current project is ethnographic research conducted by T. T. Waterman in the early twentieth century. Waterman spoke with "several hundred natives" in an effort to document all of the tribal place names in the Puget Sound region. Several of these are located near the current project area and were used to determine areas of high probability for prehistoric or ethnographic-period archaeological material (Waterman 1922) (Figure 6).

There are nine archaeological sites that have been previously recorded within 0.8 km (0.5 mi) of the project area. Of these, two are historic resources, and seven are pre contact sites. The two historic-period sites are trash dumps located along South Spokane Street near the central portion of the current project. Both were recorded during a survey conducted in preparation for the expansion of the Spokane Street Viaduct in 2002. Site 45KI529 consisted of a variety of early twentieth century artifacts including glass bottles and fragments of many different colors, light bulbs, ceramic vessels and fragments, bricks, newspaper, shoe fragments, leather, a coin, metal pieces, animal bone, clam and oyster shell. Site 45KI530 contained an array of glass bottles and ceramic fragments dating to the late nineteenth century, found below more than 3 m (10 ft) of fill material (Cole 2005).

The most extensive of the pre contact resources located near the project area is site 45KI431, also known as the Allentown Site. This shell midden is located on the eastern side of the Duwamish River, near Location 1. It was discovered and characterized during a series of excavations and monitoring in 1994 and 1995. Since there is no place name for this location in Waterman's ethnography, and it is not an ethnographically recorded Duwamish village, it is likely that the area was either used only for short periods of time or by neighboring groups. The lithic assemblage at the site is dominated by small flakes but also includes a small but diverse set of tools comprised of a core, a biface fragment, a drill fragment, a projectile point, an adze, fragments of sandstone abraders, and used flakes. The faunal remains indicate that the Allentown Site was used primarily for harvesting salmon and steelhead, although some land mammal remains were present as well. Fifteen radiocarbon dates from the site begin at around 550 BP and continue to A.D. 1900, the later dates reinforced by the presence of historic-period beads and metal harpoon (Lewarch et al. 1996). The Allentown Site has been determined eligible for listing in the NRHP.

Other shell midden sites along the Duwamish within 0.5 km (0.8 mi) of the current project include a cluster of three sites located approximately 3.7 km (2.3 mi) northwest of the Allentown Site near the southern portion of the project area. Sites 45KI815, 45KI816, and 45KI817 were discovered on the west side of the river during a cultural resource survey for the south bridge project (Demuth et al. 2008). Site 45KI815 and 45KI816 are shell middens with mammal, bird, and fish bone

included along with pieces of charcoal and fire-modified rock (FMR). Site 45KI817 contains burned and calcined animal bone found below blackened sand.

Also located near the southernmost end of the project area are sites 45KI431 and 45KI516, both on the east side of the Duwamish River. Site 45KI431 was recorded in 2004 and consists of 7 flakes, 1 retouched flake, 6 pieces of mammal bone, and approximately 100 pieces of FMR (LeTourneau 2004). Site 45KI516, also known as the Joseph Foster Site, has both a pre contact/ethnographic-period component and an historic component. All of the materials were found within 10 shovel tests between 10 and 40 centimeters (cm) (4 and 16 in) below the surface within the area of the 1853 Donation Land Claim (DLC) of Stephen Foster, whose brother Joseph later bought the claim and homesteaded there. The pre contact component included 2 flakes and 46 pieces of FMR as well as some charcoal. The historic component was comprised of a shard of stoneware, a burnt ceramic fragment, a rusted squarecut nail, 11 rusted nail shanks, colorless windowpane glass, white plastic, and 2 historic concrete and gravel composite fragments (Roedel 2002).

The last and northernmost archaeological site recorded near the project area is site 45KI118, located north of the central portion of the project. Recorded in 1966, the area is a pre contact fishing site at which several construction workers found pecked and polished sinkers. Deane (1966) notes that there is historic knowledge of canoes being tied up nearby, but the area is not mentioned in Waterman's ethnography.

Although the current study only includes those resources within 0.8 km (0.5 mi) of the project area, it is important to note that there are several resources located just outside this corridor. Many of these are pre contact sites along the edges of the Duwamish River which was channelized in historic times. Of note are sites such as 45KI23, also known as Duwamish No. 1, which was the first proto-historic site found along the Duwamish River. The site is an extensive shell midden consisting of hundreds of artifacts including both lithic and bone tools, utilized historic-period glass, and historic-period ceramics. Faunal remains indicate that the inhabitants of the site were exploiting both terrestrial and marine animals including deer, waterfowl, fish, and domestic cow. This site is one of many that corroborate that ethnographic data indicating that the Duwamish River and surrounding area was extensively used in pre-historic, proto-historic, and historic periods by Native peoples.

1.7.3 Previous Archaeological Surveys

Twelve archaeological surveys or archaeological monitoring projects have been conducted in locations adjacent to the current project area (see Table 3). The majority of these surveys are related to improvements on the West Lake Union Trail or the SR 99: Alaskan Way Viaduct and Seawall Replacement Project.

1.8 Historic Resources Methods and Results

1.8.1 Historic Resources Survey

AINW established the criteria for the historic resource survey in consultation with WSDOT cultural resource specialist Connie Walker Gray. The survey included identification and description of any historical resources that are 50 years or older, and within 61 m (200 ft) of an ITS project work location. The survey also included the recording on a DAHP Historic Property Inventory Form database file any resource that had not previously been recorded.

AINW reviewed the "SR 99 E Marginal Way and Ellis Ave S to N 145th St – ITS" engineering drawings and compared these with the resources identified during the background review. One historical resource, the North 46th Street/SR 99 Overcrossing, was identified as meeting the criteria described above, and was recorded and evaluated by AINW. The Historic Property Inventory Form for this historical resource is included in Appendix B.

1.8.2 Historic Resources Results

The literature review and records search of WSDOT publications identified seven road-related transportation structures that have not been formally recorded on DAHP historic property inventory forms (WSDOT 2008). The first three of these are the bridges at the 14th Avenue South SR 99 Undercrossing (Concrete Slab) (Figure 7), the Cloverdale Street SR 99 Overcrossing (Pre-Tensioned Concrete Beam) (Figure 7), and the Spokane Street SR 99 Overcrossing (Concrete Box Girder) (Figure 15). All were built circa 1960 as part of the construction of the then-named Primary State Highway No. 1 West Marginal Branch freeway. Since these three resources are not 50 years or older, they are not included in the historic resources impact area, therefore they will not be considered further in this report.

The fourth historic resource that has not been formally recorded is the 1941 South Spokane Street Viaduct (Puget Sound Regional Council 2004:5) (Figure 15). The highway runs east-west between Interstate-5 and the Port of Seattle marine terminals on Harbor Island. Although this resource is older than 50 years, it is outside of the 61 m (200 ft) historic resources impact area, therefore it will not be considered further in this report.

The remaining three unrecorded road-related transportation structures are the Lynn Street Bridge/SR 99 Overcrossing, the North 38th Street Bridge/SR 99 Overcrossing, and the North 46th Street Bridge/SR 99 Overcrossing, along Aurora Avenue North (Figure 20). These structures are similar in materials and design to the circa 1935, poured-in-place structures noted above as having been previously recorded on DAHP inventory forms. All of the structures were built in the 1930s, as part of the reconstruction and extension of the Pacific Highway northward, following the completion of the Aurora Avenue Bridge in 1932. The Multi-lane

"speedway," as it was labeled in 1930, provided a direct approach from the newly-constructed bridge northward to the then-city limits at North 85th Street. Of these three resources, only the North 46th Street/SR 99 Overcrossing is within 61 m (200 ft) of an ITS work area, therefore while this resource will be discussed below, the other two will not be considered further in this report.

Historically, the Pacific Highway was the main north-south highway in Washington State. This route started at the Interstate Bridge between Portland, Oregon, and Vancouver, Washington, and became US 99 in 1926. State law changed the highways designation to Primary State Highway No. 1 in 1937. The state highway numbering system was revised in 1967, and Primary State Highway No. 1 became SR 99 following the completion of Interstate-5.

AINW recommends the North 46th Street/SR 99 Overcrossing, temporary designation 08/1686-1 to be eligible for listing in the NRHP under Criterion A for its association with the construction of the Pacific Highway along North Aurora Avenue in the 1930s. This northward extension and improvement of the Pacific Highway influenced the residential and commercial development of the region north of the Aurora Avenue Bridge. The overcrossing is also recommended to be eligible under Criterion C as embodying the distinctive characteristics of its period, type, and method of construction. The series of vehicular and pedestrian bridges between the Aurora Avenue Bridge and North 63rd Street are uniformly constructed using concrete in various forms. The railings of the vehicular bridges, as well as their on- and off-ramps, also were designed to be uniform in appearance throughout the length of the segment between the bridges and North 63rd Street.

The ITS project work activity at this location involves installing a CCTV Camera on a new pole within the median between Aurora Avenue North and an on-ramp southwest of the overcrossing. AINW recommends that the proposed ITS project work will have no effect on the NRHP-eligible North 46th Street/SR 99 Overcrossing.

1.9 Archaeological Methods and Results

1.9.1 Background Research

AINW conducted background research on the cultural and geological history of the project area at several information repositories, including DAHP, university libraries, local libraries, and the AINW library. Information regarding the geomorphic setting of the project area was compiled from sources pertaining to the bedrock geology, the surficial geology, the fault systems, and the landslide history of the area. Public records, online GLO maps (1856, 1859, 1862, and 1863), online Sanborn fire insurance maps, and other map repositories were also consulted to gain information about the historic setting of each location.

Within the current project area, AINW study Locations 3 through 10 would have been the most affected by the reconstruction and industrialization of Seattle's tide flats and the Duwamish Waterway. Since only a portion of the Duwamish was channelized, Locations 1 and 2 remain in the same general locations relative to the riverway. GLO maps from 1862 and 1863 (GLO 1862a, 1863a) show no structures in the vicinity of these locations, although Bureau of Land Management records show that Location 1 was within the 1873 land scrip of George R. Bartlett and David Hall and Location 2 was within the 1873 homestead entry of Henry H. Westren. Along with areas further downstream and nearer to Elliot Bay, these locations became more industrialized in the early twentieth century, especially after the inception of Boeing Field to the east in 1928.

Prior to the Duwamish Waterway construction, Locations 3 through 6 would have been nearer to the Duwamish River. South of this, the river maintained its natural alignment. The earliest GLO maps of Township 23 North, Range 4 East, and Township 24 North, Range 4 East, show that settlements in this area were sparse in the mid nineteenth century. Locations 3 and 4 are shown on the 1863 GLO (GLO 1863a, 1863b) as being within the 1866 DLC of John and Eva Buckley. No structures or claims are shown in the vicinities of Locations 5 or 6. One road is shown approximately 0.8 km (1 mi) east of the river on the 1862 GLO map and is labeled "Road from Stelacoon [Steilacoom] to Seattle." This is likely a successor of the Duwamish River Road which was built in 1855 to connect the Duwamish Valley to Seattle, becoming one of the first roadways in King County (Klingle 2007). Today, Locations 3 and 4 are located directly west of Boeing Field. As with Locations, 1 and 2, this area became much more industrialized after the straightening of the Duwamish as manufacturers, particularly those related to the aircraft industry, began moving into the area.

The 1917 Sanborn map of the Georgetown neighborhood, in which Locations 5 and 6 are located, shows that the southern portion of East Marginal Way had already been constructed south of the Industrial District by that time. Location 6 was right next to the channelized river, although SR 99 had yet to be built. Location 5 was within Lot 7750 on the 1917 Sanborn map, which was occupied by the King County Almshouse and hospital in Georgetown. The Almshouse was completed in 1894 with a 125-bed capacity and subsequently expanded in 1908 and 1911. Eventually, it became so full that a new hospital was opened on First Hill in the 1920s and the Georgetown facility became King County Hospital Unit 2 for convalescent patients. As new hospitals were added around the city in the following decades, the building was eventually sold and was demolished in the late 1950s (Wilma 2001).

As shown on Figure 23, the northern half of the central portion of the project area would have been within the tide flat area in southern Elliot Bay prior to its infilling. Location 10 was in the middle of this tide flat area, and Locations 7, 8, and 9 were at the southern margin of it. This can be seen on the 1862 and 1863 GLO maps of Township 24 North, Range 4 East (GLO 1862b, 1863b). Sanborn maps of the same area from 1916 and 1917 show that in a matter of decades each of these locations

had been covered with fill and were beginning to be developed, with many roads already constructed within alignments that they retain today. On the 1917 Sanborn map of the Duwamish Waterway area, a road named Whatcom Avenue is in the alignment of modern day SR 99 near Locations 7, 8, and 9. At this time, only Dakota Street and Oregon Street ran east-west south of Spokane Street near where South Nevada Street, South Idaho Street and Diagonal Avenue South are present today. No buildings are shown on the lots surrounding Locations 7, 8, or 9 on the 1917 map, although the nearby railroad lines had been put in place. The 1916 map depicting Location 10 calls the area the "Congested District" and shows West Lander Street already in place crossing several railroad tracks, as well the continuation of Whatcom Avenue, still in the alignment of today's SR 99.

Green Lake, near which Location 11 is situated, was first recorded by Euroamericans in 1855 during a GLO survey (GLO 1856). It received its name from the color of the annual algae bloom the surveyors observed upon its discovery. No structures or roads are shown near the project area on the GLO maps created from this and a subsequent survey in 1863 (GLO 1863c). The first major industry in the Green Lake area was logging. As settlement in the area increased in the late nineteenth century, the economy shifted to livestock, farming, and orchards and development increased. The area on the southwestern side of the lake was first made into a park by Guy Phinney in 1889 (Seattle Parks and Recreation 2009) and a 1897 USGS map show a road leading to the lake near Location 11 at this time. In the early 1900s, as Elliott Bay was re-manufactured to the south, the Olstead Brothers Company and R.H. Thomson collaborated to turn Green Lake into a get-away for Seattlites. Engineer crews lowered Green Lake by over ten feet and filled the shoreline with sandy beaches and parkways to create open spaces and sunbathing spots. Since this time, the lake has been plagued with pollution and drainage problems, but it is still used as a park and leisure area today by people in the surrounding residential neighborhoods.

1.9.2 Identification of HPAs

AINW integrated information gathered from the geomorphological assessment and background research pertaining to pre contact, ethnographic, and historic use of the project area in order to identify locations within the project area with a high probability for containing archaeological deposits. Within these HPAs, 11 localities were slated for ground disturbance as part of the SR 99 ITS Improvements Project. AINW focused on these 11 localities for archaeological investigations, which included site inspection and selective subsurface testing for archaeological deposits. The 11 locations are listed above are shown on Figures 8, 16, and 21. The results of the field inspections and testing are listed below for each of these 11 locations.

1.9.3 Archaeological Field Methods

AINW conducted a reconnaissance survey of the proposed SR 99 ITS Improvements Project area on February 19, 2009. AINW senior geoarchaeologist Michele L. Punke, Ph.D., R.P.A., and staff archaeologist Brandi Nash, B.S.,

examined the project area's environmental setting, landform position, disturbance histories, and access to specific improvement areas. AINW conducted a second archaeological field survey of the project area on May 18 to 20, 2009. The work was performed by AINW supervising archaeologist Amy E. Foutch, M.A., and field archaeologists Katelyn Swiecick, B.A., and Jeff Maceyko, B.A. The survey included examination of 11 proposed construction locations that were determined to be within the identified HPAs.

The archaeological survey of each HPA within the project area was conducted to inspect the landform setting of each of the proposed improvement locations. This inspection was performed to determine whether the proposed construction location appeared to be on a natural or built landform and the likelihood of encountering intact mineral soils during construction. The ground surface in each area was also examined for the presence of artifacts and spaces suitable for shovel testing were identified.

Eight shovel tests were excavated to determine the depth of fill sediment at the HPAs and to search for archaeological deposits (Figure 2). Prior to excavation of shovel tests, each location was coordinated with the office that manages the one-call utilities notification system. Excavation was conducted after the utilities had been marked at each location. In general, the probes were placed near the area of intended ground disturbance, although in some cases placement had to be shifted slightly to avoid utility lines. The shovel tests were slightly conical, 50 cm (20 in) in diameter at the surface, and were excavated to a depth coinciding with that of the proposed disturbance in each area, if possible. A hand auger was used to sample deposits that could not be reached by shovel excavation at locations where deeper construction-related impacts were planned. The excavated sediments from the shovel and auger tests were screened through nested 3- and 6-mm (⅛- and ¼-in) mesh hardware cloth. The probes were recorded on AINW Shovel Test Record Forms and backfilled after excavation was completed.

1.9.4 Archaeological Field Results

Based on the background research, eleven of the proposed improvement locations were determined to have a high probability for containing archaeological deposits. These locations, the reasons for their determination as HPAs, and the work conducted at each location is described below.

1.9.4.1 South Section

1.9.4.1.1 Location 1

Location 1 encompasses the area surrounding the intersection of SR 99 and SR 599 with Tukwila International Boulevard in Section 9 of Township 23 North, Range 4 East. Proposed improvements to this area include the installation of conduit, fiber optic, and vehicle detection loops as well as several junction boxes, cabinet boxes,

pull boxes and new cabinet bases. Depth of impact during these improvements will range from 61 to 137 cm (24 to 54 in) deep.

This location was defined as an HPA based on three factors. First, it is in close proximity to a location listed by T. T. Waterman in his manuscript documenting the geography, history, and culture of the indigenous peoples of the Puget Sound area (Waterman 1922). This location, "Stu'bla," is described as a hillside and location of "North-wind's ancient village" (Waterman 1922:194). Second, it is positioned along the banks of the Duwamish River, which would have been utilized by humans and animals in the past. As mentioned above, the river appears to have occupied this route since at least historic times, when GLO surveyors mapped its course (GLO 1862a) and this portion of the river was not channelized during the creation of the Duwamish Waterway. Third, this area has a geologic history conducive to the preservation of archaeological sites. The surficial geology of the location is mapped as Quaternary alluvium (Troost et al. 2005). More specifically, this alluvium represents Duwamish River sedimentary deposits that have the potential for containing archaeological materials on their surface or buried under more recently deposited alluvium.

Although the area is located on the western bank of the Duwamish River, it has been built up significantly to allow for overpasses and on and off ramps for the highways (Appendix A:Photos 1 and 2). The proposed improvements will be placed at several locations within the intersection, but the majority of these are in areas in which the fill sediment is noticeably deeper than the proposed impacts (Appendix A:Photo 3). Only two of these areas were identified as suitable for shovel testing. ST-5 was placed near the intersection of South 116th Way and the SR 599 southbound off ramp while ST-6 was placed in the triangle of grass-covered land between the northbound on and off ramps of SR 99 from Tukwila International Boulevard (Appendix A:Photos 4 and 5; Figures 8, 9a, and 9b).

ST-5 was excavated to a depth of 70 cm (28 in). The upper 10 cm (4 in) of the soil was a sod cap, below which lay fill sediment comprised of a yellowish-brown coarse-grained loamy sand with approximately 50% poorly sorted rounded and angular gravels. ST-6 was also excavated to a depth of 70 cm (28 in). The upper 19 cm (8 in) of the shovel test contained an initial fill layer of dark brown sandy loam with approximately 30% rounded gravels. From approximately 19 to 30 cm (7.5 to 12 in) below the surface was a gray water-perching layer overlying a deposit of very compact fill sediment comprised of yellowish-brown medium grained loamy sand with approximately 50% poorly sorted sub-rounded to rounded gravels. This underlying layer of fill was too compact to be excavated beyond 70 cm (28 in) with hand tools, and the proposed impact in this area reaches deeper than this. **Therefore, AINW recommends monitoring of this area during the proposed improvements to inspect sediments excavated deeper than 70 cm (28 in).** No artifacts were found within ST-5 and ST-6.

1.9.4.1.2 Location 2

Location 2 is within the intersection of SR 99 and 102nd between the northbound on and off ramps on the east side of SR 99 in Section 4 of Township 23 North, Range 4 East (Figures 8 and 10). This area is at the western edge of the Duwamish River floodplain. Proposed improvements at this location are the installation of a junction box and a controller cabinet, for disturbance to a depth of 61 cm (2 ft) below the ground surface.

This location was considered to be within an HPA based upon three factors. First, it is in close proximity to a location discussed in Waterman's text (Waterman 1922:194). This location, "Cxi'yaqu," is said to mean "beaver" and is an isolated knoll that was included in a Native American story involving North Wind and South Wind. Second, the location is positioned on a flat plain between two stretches of the Duwamish River, which would have been a good place for river access by humans and animals in the past. The river appears to have occupied this route since at least historic times, when GLO surveyors mapped its course (GLO 1862a) and this portion of the river was not channelized during the construction of the Duwamish Waterway. Additionally, this location has a geologic history conducive to the preservation of archaeological sites. The surficial geology of the location is mapped as Quaternary alluvium (Troost et al. 2005). This alluvium represents Duwamish River sedimentary deposits that have the potential for containing archaeological materials on their surface or buried under more recently deposited alluvium.

ST-3 and ST-4 were excavated at Location 2 (Appendix A:Photo 6). ST-3 was only dug to 30 cm (12 in) because a layer of large gravels was encountered which could not be penetrated (Appendix A:Photo 7). ST-4 was then opened 10 m (33 ft) to the north and was dug to a depth of 70 cm (28 in) and augered to 110 cm (44 in). The upper 35 cm of ST-4 consisted of poorly sorted fill sediment, below which lay intact soils consisting of a very compact, very fine, gray sand with no rocks from 35 to 50 cm (14 to 20 in) and a gray and brown coarse grained sand with lenses of oxidized and reduced iron between 50 and 100 cm (20 and 40 in). From 100 to 110 cm (40 to 44 in) below the surface is a black clay which is indicative of a past wetland environment. No artifacts were found within ST-3 and ST-4.

1.9.4.1.3 Location 3

Location 3 is situated in Section 4 of Township 24 North Range 4 East on the western shoulder of SR 99, approximately 122 m (400 ft) south of 17th Place South (Figures 8 and 11). Updated plan designs indicate that the improvement plans in this location have changed since the fieldwork was conducted, and there will be no impact to the intact sediments in this area.

This location is considered to be within an HPA based upon two factors. First, the location is positioned near the confluence of the Duwamish River and a former tributary stream that flowed towards the northeast from the ridgeline bordering the river to the south and west. Both the river and the stream would potentially have

been used by humans and animals in the past. Second, the geologic history of the area is conducive to the preservation of archaeological sites. The surficial geology of the location is mapped as Quaternary alluvium (Troost et al. 2005). More specifically, the alluvium represents Duwamish River sedimentary deposits that have the potential for containing archaeological materials on their surface or buried under more recently deposited alluvium.

The roadway in this area has been built on fill, as seen by the height of the road above the ditch on the west (Appendix A:Photo 8). ST-2 was placed slightly down the drainage slope to facilitate reaching intact soils by digging through less fill sediment (Appendix A:Photo 9). Therefore, the surface of ST-2 is approximately 70 cm (28 in) below the current height of SR 99. The shovel test was dug to 140 cm (56 in). The upper 80 cm (32 in) within ST-2 were fill sediment consisting of yellowish-brown silty sandy loam with 30 to 40% poorly sorted rounded gravels. Below this was what appeared to be a buried A horizon of dark brown sandy loam with approximately 10% rounded pebbles, overlying a gray and red loam with mottles of reduced and oxidized iron at the water table around 120 cm (47 in) below the surface. No cultural materials were found in the intact soils of ST-2.

1.9.4.1.4 Location 4

Location 4 is on the shoulder of SR 99 between 14th Avenue South and the southbound on ramp from 14th Avenue South to SR 99 in Section 32 of Township 24 North, Range 4 East (Figures 8 and 12). Improvements to this location include the installation of a pull box, junction box, and transformer and controller cabinets, which would impact a maximum depth of 107 cm (3.5 ft).

This location was considered to be within an HPA based upon two factors. First, the location is in close proximity to a stream listed by Waterman (1922:194). This location, "gwExhwalltu," is translated to mean "string" and "house" by Waterman and was mapped at the location where a small tributary stream entered the Duwamish River. In addition, this is an area with a geologic history conducive to the preservation of archaeological sites. The surficial geology of the location is mapped as Quaternary alluvium (Troost et al. 2005). The alluvium represents Duwamish River sedimentary deposits that have the potential for containing archaeological materials on their surface or buried under more recently deposited alluvium.

ST-1 was excavated next to the stake indicating the new location of the cabinet that will be placed during the proposed improvements (Appendix A:Photo 10). The test was dug with a shovel to a depth of 85 cm (34 in) below which an auger was used to reach a depth of 140 cm (56 in). Sediments within the shovel test included several layers of varying fill material, overlying intact sediments at approximately 105 cm (42 in) below the ground surface. No artifacts were found within ST-1.

1.9.4.2 Central Section

1.9.4.2.1 Location 5

Location 5 is on the northeast side of East Marginal Way, approximately 240 m (785 ft) northwest of its intersection with Corson Avenue South, in Section 29 of Township 24 North, Range 4 East (Figures 16 and 17). Proposed improvements at this location include the installation of a controller cabinet, cabinet foundation, and a DMS sign foundation to a depth of 4.5 to 6 m (15 to 20 ft).

This location was defined as an HPA based upon several factors. First, the location is positioned near to the margin of the Duwamish River, and was even closer to the river's edge prior to its straightening in the early 1900s. It would have, therefore, been a desirable location to humans and animals in the past. The second factor determining the location to be an HPA is that this is a location with a geologic history conducive to the preservation of archaeological sites. The surficial geology of the location is mapped as Quaternary alluvium (Troost et al. 2005). Quaternary alluvium represents Duwamish River sedimentary deposits that have the potential for containing archaeological materials on their surface or buried under more recently deposited alluvium. Lastly, the King County Almshouse and Hospital was built on the lot within which Location 5 is situated. Although the building was eventually torn down in the 1950s, there is the possibility that historic-period materials may have been deposited in the area.

One shovel test was placed within Location 5, in the grassy area approximately 5 m (17 ft) from the edge of the road (Appendix A:Photo 11). ST-7 was excavated to a depth of 70 cm (28 in) below the surface. Below the 5-cm (2-in) sod cap, the upper 20 cm (8 in) of ST-7 consisted of fill sediment overlying a layer of intact native soil consisting of fine-grained black sandy loam extending to the base of the shovel test at 70 cm (28 in). No artifacts were found within ST-7. However, since the total depth of disturbance was not reached with the hand auger, **AINW recommends archaeological monitoring of this area during installation of the proposed cabinet and foundations to inspect sediments excavated deeper than 70 cm (28 in).**

1.9.4.2.2 Location 6

Location 6 is at the intersection of East Marginal Way and the 1st Avenue South Bridge in Section 20 of Township 24 North, Range 4 East (Figure 16). The improvements at this location include the installation of a controller cabinet and a cabinet foundation to a depth of 61 cm (2 ft).

This location is considered to be within an HPA based upon two factors. First, it is positioned near to the margin of the Duwamish River, which would have been a desirable location for humans and animals in the past. Although this part of the river has been channelized, based on GLO maps from 1862 and 1863 (GLO 1862b, 1863b), the river flowed very near, if not over this location prior to its reconstruction (Figures 14 and 23). Additionally, this is an area with a geologic history conducive to

the preservation of archaeological sites. The surficial geology of the location is mapped as artificial fill materials (Troost et al. 2005), but Quaternary alluvium likely underlies the fill. Quaternary alluvium represents Duwamish River sedimentary deposits that have the potential for containing archaeological materials on their surface or buried under more recently deposited alluvium.

The cabinet to be replaced at Location 6 is entirely surrounded by concrete (Appendix A:Photo 12). No shovel tests were placed at this location due to the concrete barrier. **Therefore, AINW recommends archaeological monitoring of this area during the proposed improvements to inspect sediments excavated below the concrete.**

1.9.4.2.3 Location 7

Locations 7, 8, and 9 were determined to be HPAs because they are positioned either within or near to the former margin of Elliot Bay prior to its being infilled. Several locations surrounding Elliot Bay are mentioned by Waterman in his Index to Indian Place Names (Waterman 1922). The bay extended to this location when GLO surveyors mapped its course, and it appears that all three locations would have been at the southern margins of the tide flats (GLO 1862b) (Figure 14). Smaller, tributary streams feeding into Elliot Bay were also mapped in the vicinity by the GLO surveyor. In addition, these three locations have a geologic history conducive to the preservation of archaeological sites. The surficial geology of the area is mapped as artificial fill materials (Troost et al. 2005), but Quaternary alluvium likely underlies the fill. The Quaternary alluvium represents Duwamish River sedimentary deposits that have the potential for containing archaeological materials on their surface or buried under more recently deposited alluvium.

Location 7 lies just south of the intersection of SR 99 and South Alaska Street in Section 19 of Township 24 North Range 4 East (Figure 16). Proposed improvements for this location include the replacement of a handhole and a cabinet foundation on the eastern side of SR 99, each requring a maximum depth of 61 cm (2 ft).

The current handhole and cabinet at Location 7 are both surrounded by fill and concrete and could therefore not be excavated with shovel tests (Appendix A:Photo 13). There is a possibility of finding out-of-context historic-period or prehistoric artifacts in any fill materials which were placed during the infilling of the tideflats and prehistoric artifacts in the intact native soils below the fill. **Therefore, AINW recommends monitoring in this area during the proposed improvements to inspect sediments excavated below the concrete.**

1.9.4.2.4 Location 8

Location 8 is at the intersection of SR 99 and Diagonal Avenue South in Section 18 of Township 24 North Range 4 East (Figure 16). The improvements at this location are the replacement of a cabinet foundation and handhole to a depth of 61 cm (2 ft).

The cabinet and handhole currently placed in Location 8 are surrounded by fill sediment and concrete. Therefore, no shovel tests were excavated at this location (Appendix A:Photo 14). As with Location 7, there is a possibility of finding out-of-context historic-period or prehistoric artifacts in any fill materials which were placed during the infilling of the tideflats and prehistoric artifacts in the intact native soils below the fill. **Therefore, AINW recommends monitoring in this area during the proposed improvements to inspect sediments excavated below the concrete.**

1.9.4.2.5 Location 9

Location 9 includes three improvement areas around the intersection of East Marginal Way/SR 99 and South Idaho Street in Section 18 of Township 24 North Range 4 East (Figure 16). Proposed improvements include the replacement of a cabinet foundation that will extend to a depth of 61 cm (2 ft).

The two proposed work areas on the west side of SR 99 at Location 9 are surrounded by fill sediment and concrete and could not be excavated (Appendix A:Photo 15). The grassy area surrounding the cabinet on the east side of the road is conducive to shovel testing but underground utility lines prevented safe excavation (Appendix A:Photo 16). Therefore, no subsurface testing was conducted at Location 9. As with Locations 7 and 8, there is a possibility of finding out-of-context historic-period or prehistoric artifacts in any fill materials which were placed during the infilling of the tideflats and prehistoric artifacts in the intact native soils below the fill. **Therefore, AINW recommends monitoring in this area during the proposed improvements to inspect excavated sediments.**

1.9.4.2.6 Location 10

Location 10 is situated along the edge of SR 99 near South Lander Street in Section 7 of Township 24 North, Range 4 East (Figure 16). The proposed work in this area is the installation of a control cabinet and a cabinet foundation which will reach 61 cm (2 ft) in depth.

Location 10 was determined to be an HPA based on previous fieldwork in which possible hunter-gatherer and historic-period artifacts were found during the monitoring of geotechnical boring in this area (Roedel et al. 2003). Although the location was within the tide flats prior to their infilling, fill sediment that was placed in the area could contain out-of-context archaeological materials from the re-graded hills.

As with Locations 6 through 9, the area surrounding Location 10 contains fill sediments and concrete that did not allow for shovel testing (Appendix A:Photo 17). However, no artifacts were visible in the fill sediment near the location and the artificial height of the road in the area indicates that there is well over 61 cm (2 ft) of fill sediment in this area. It is therefore unlikely that intact soils will be impacted during the proposed improvements.

1.9.4.3 North Section

1.9.4.3.1 Location 11

Location 11 is on the west side of Aurora Avenue South at its intersection with North 68th Street in Section 6 of Township 25 North, Range 4 East (Figures 21 and 22). Proposed improvements at this location include the replacement of a cabinet foundation and handhole, to a depth of 61 cm (2 ft).

Location 11 was determined to be an HPA based on several factors. First, although the underlying surface is composed of glacial outwash deposits that do not have a high likelihood of containing buried components, the proximity of the location to Green Lake implies that lacustrine sediment may have been deposited in the area during high lake level periods. Green Lake, formerly Glacial Lake Russell, would have provided humans and animals with a fresh water source since its formation in the late Pleistocene (Sylvester and Anderson 1960; Troost and Booth 2008). The location was mentioned by Waterman (1922:189) as a location used in ethnographic times by people who fished for suckers and perch with basket traps, and for salmon that entered the location from a creek which fed the lake. This area was also considered an HPA for historic-period resources based on the presence of early roads and settlements in the area. As mentioned above, the area on the southwestern side of the lake was first developed into a park by Guy Phinney in 1889 (Seattle Parks and Recreation 2009) and an 1897 map (USGS 1897) shows a road leading to the lake near the proposed construction site.

One shovel test (ST-8) was excavated at Location 11, in a grassy area between the curb and sidewalk (Appendix A:Photo 18). The upper 40 cm (16 in) of ST-8 was a very dark brown, fine grained sandy loam with approximately 25% rounded gravels. Below this was fill sediment which extended to the bottom of the shovel test at a depth of 70 cm (28 in). No artifacts were found within the shovel test.

1.10 Summary and Recommendations

AINW conducted background research and a geomorphological assessment of the proposed SR 99 ITS Improvements Project area. The literature review and records search identified three NRHP-listed historic properties and nine inventoried resources within the project area of the proposed SR 99 ITS Improvements Project. The background review also found six historic resources within the project area that have not been previously recorded. One historical resource was identified as being 50 years or older and within 61-m (200-ft) of an ITS project work area. AINW recommends that this resources, the North 46th Street/SR 99 Overcrossing, is eligible for listing in the NRHP and that it will not be affected by the proposed improvements.

Based on the background review and geomorphic study of the project area, 11 locations within the project area that are to be impacted by construction were identified as having a high potential for containing archaeological deposits. Of these

11 HPAs, six provided a suitable land surface for subsurface testing. AINW excavated 8 shovel tests within the 6 locations. No archaeological deposits were encountered during shovel testing of the project area. Two shovel tests (ST-6 and ST-7) could not reach to the depth of the proposed construction disturbance. Thus, archaeological monitoring during construction activities is recommended due to the potential for archaeological deposits below fill sediment at Location 1 and Location 5. In addition, since no shovel testing could be conducted and no soils were visible in Locations 6, 7, 8, and 9, monitoring is recommended during construction in these areas as well.

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TABLE 1

KEY FOR THE GEOMORPHIC
SETTING OF THE PROJECT AREA

Geologic Unit Abbreviation	Description
Ec(2t)	Marine sedimentary rocks
Em(2)	Marine sedimentary rocks
Evc(t)	Eocene volcaniclastic deposits
OEn	Near shore sedimentary rock
Oian	Oligocene intrusive andesite
Qa	Alluvium
Qc	Quaternary sediment deposits or rocks
Qf	Artificial fill
Qga	Glacial outwash
Qgd	Glacial drift
Qgo	Glacial Outwash
Qgp	Glacial drift, pre-Fraser glaciation
Qgt	Glacial till
Qgu	Glacial drift
Qls	Landslide deposit

TABLE 2

HISTORIC RESOURCES WITHIN THE APE

LOCATION	NAME	RESOURCE TYPE/ CONSTRUCTION DATE	DAHP ID NO./ DESIGNATION
14th Avenue South (Southern Section) Figure 7	14th Avenue South SR 99 Undercrossing	Structure/circa 1958	Potential historic resource
Cloverdale Street (Southern Section) Figure 7	Cloverdale Street SR 99 Overcrossing	Structure/circa 1958	Potential historic resource
Spokane Street (Central Section) Figure 15	Spokane Street SR 99 Overcrossing	Structure/circa 1958	Potential historic resource
South Spokane Street (Central Section) Figure 15	South Spokane Street Viaduct	Structure/1941	Potential historic resource
Lynn Street (Northern Section) Figure 20	Lynn Street SR 99 Overcrossing	Structure/circa 1932	Potential historic resource
SR 99/Aurora Avenue North (Northern Section) Figure 20	Northern Pacific Railroad belt line (Westlake Avenue North segment)	Structure/1912	DAHP Inventory (Demolished)
SR 99/Aurora Avenue North over Lake Washington Ship Canal (Northern Section) Figure 20	Aurora Avenue (George Washington Memorial) Bridge	Structure/1932 Bridge-cantilever arch truss	DAHP Inventory form WHR, NRHP (1982)
SR 99/Aurora Avenue North over Lake Washington Ship Canal (Northern Section) Figure 20	Lake Washington Ship Canal	Structure/1917 Lake Washington Ship Canal	DAHP Inventory form WHR, NRHP (1978)
2770 Westlake Avenue North (Northern Section) Figure 20	Wagner Houseboat or "The Old Houseboat"	Building/circa 1912 houseboat	DAHP Inventory form WHR, NRHP (1982)
SR 99/Aurora Avenue North at North 38th Street (Northern Section) Figure 20	North 38th Street SR 99 Overcrossing	Structure/circa 1935	Potential historic resource
SR 99/Aurora Avenue North at North 41st Street (Northern Section) Figure 20	North 41st Street Pedestrian Bridge SR 99 Undercrossing	Structure/circa 1935	DAHP Inventory form
SR 99/Aurora Avenue North at North 46th Street (Northern Section) Figure 20	North 46th Street SR 99 Overcrossing	Structure/circa 1935	Potential historic resource

TABLE 2, continued

LOCATION	NAME	RESOURCE TYPE/ CONSTRUCTION DATE	DAHP ID NO./ DESIGNATION
SR 99/Aurora Avenue North at North 50th Street (Northern Section) Figure 20	North 50th Street SR 99 Overcrossing	Structure/circa 1935	DAHP Inventory form
Woodland Park at SR 99 MP 35.77 (Northern Section) Figure 20	Pedestrian Bridge SR 99 Undercrossing	Structure/circa 1935	DAHP Inventory form
Woodland Park at SR 99 MP 35.88 (Northern Section) Figure 20	Pedestrian Bridge SR 99 Undercrossing	Structure/circa 1935	DAHP Inventory form
Woodland Park at SR 99 MP 35.99 (Northern Section) Figure 20	Pedestrian Bridge SR 99 Undercrossing	Structure/circa 1935	DAHP Inventory form
SR 99/Aurora Avenue North at North 63rd Street (Northern Section) Figure 20	North 63rd Street SR 99 Overcrossing	Structure/circa 1935	DAHP Inventory form
SR 99/Aurora Avenue North at North 102nd Street (Northern Section) Figure 20	North 102nd Street Pedestrian Bridge SR 99 Undercrossing	Structure/date unknown	DAHP Inventory form
SR 99/Aurora Avenue North at North 130th Street (Northern Section) Figure 20	North 130th Street Pedestrian Bridge SR 99 Undercrossing	Structure/1963	DAHP Inventory form

Note: DAHP = Washington Department of Archaeology and Historic Preservation, NRHP = National Register of Historic Places, MP = Mile Post, WHR = Washington Heritage Register

TABLE 3

PREVIOUS SURVEYS ADJACENT TO THE PROJECT AREA

Reference	Type of Investigation	Description	Archaeological Resources Identified Within 1.6 km (1 mi) of Project Area
Robbins and Larson 1996	Archaeological Monitoring	Monitored excavations along Southwest Spokane Street for the Alki Transfer/CSO Facilities Project	None
Courtois et al. 1999	Cultural Resources Survey	Background review, survey and subsurface testing for the Central Link Light Rail line throughout Seattle	None
Cole 2001	Archaeological Survey	Cell Tower survey at the SR-99, 14th Street interchange	None
Nelson 2001	Cultural Resources Survey	Background review and survey along Westlake Avenue North from Aloha Street to the Fremont Bridge for West Lake Union Trail Improvement	None
Northwest Archaeological Associates 2002	Archaeological Monitoring	Monitored excavations along Westlake Avenue North for West Lake Union Trail Improvement	None
Cole 2005	Archaeological Monitoring	Monitoring of excavations along South Spokane Street for the expansion of the Spokane Street Viaduct	45KI529, 45KI530
Roedel et al. 2003	Archaeological Monitoring	Monitored geotechnical borings along the Alaskan Way Viaduct	Possible hunter-gatherer and historic-period deposits
Shong and Miss 2004	Archaeological Monitoring	Monitored excavation of two areas along Westlake Avenue North and 8th Avenue for West Lake Union Trail Improvement	None
Gillis et al. 2005	Archaeological Monitoring	Monitored Geotechnical Borings from Harrison Street to Valley Street along Aurora Avenue	None
CH2MHill 2007	Cultural Resources Survey	Background review and survey of 110th Street to 145th Street along Aurora Avenue North	None
Bundy and Gray 2008	Cultural Resources Survey	Survey and testing of SR 99 between 2nd Avenue and Denny Way for Battery Street Tunnel Fire and Safety Upgrades	None

Figure 1. SR 99 Intelligent Transportation Systems Improvement Project.

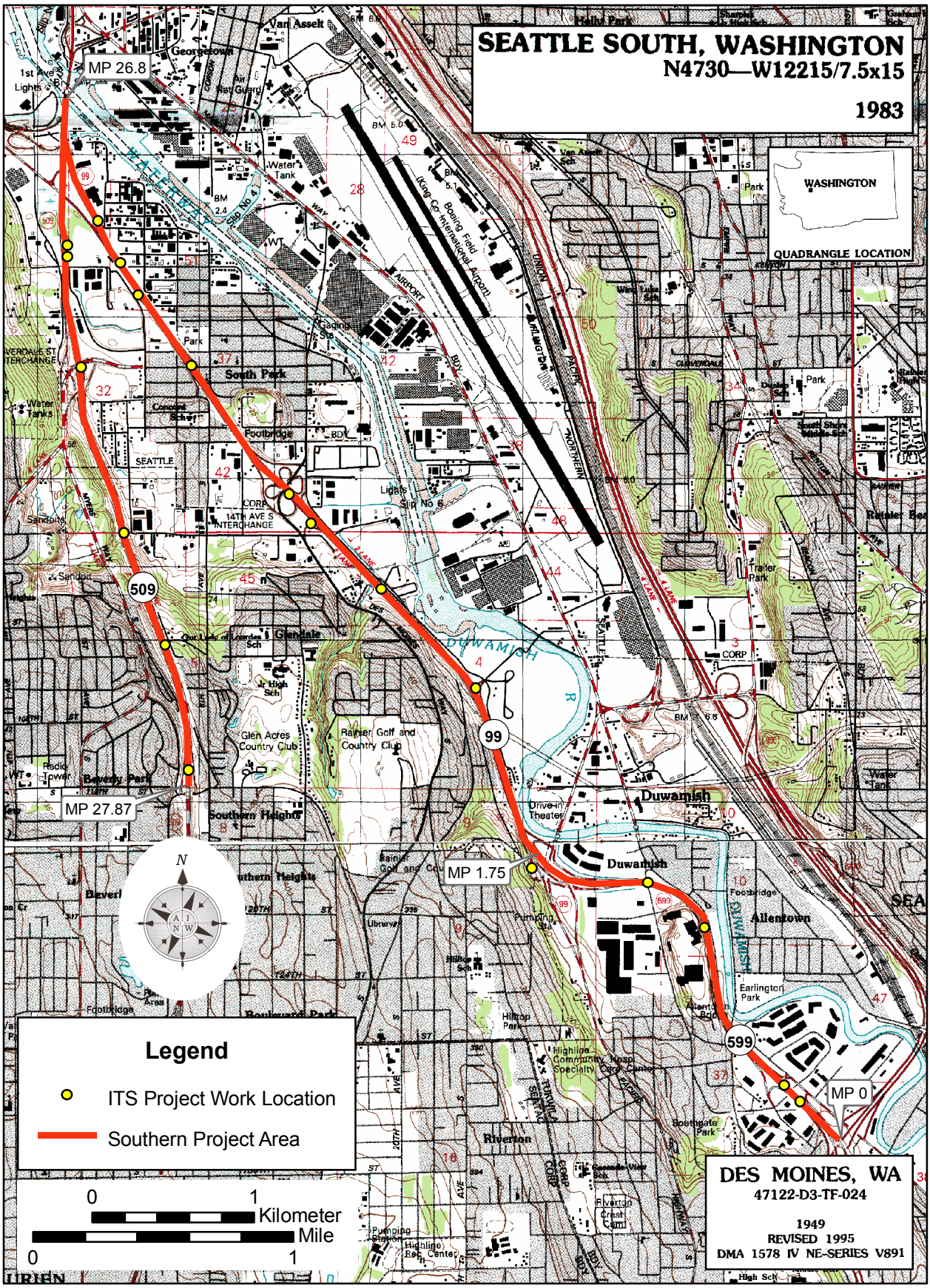


Figure 2. SR 99 Intelligent Transportation Systems Improvement Project construction locations within the Southern Section of the project area.

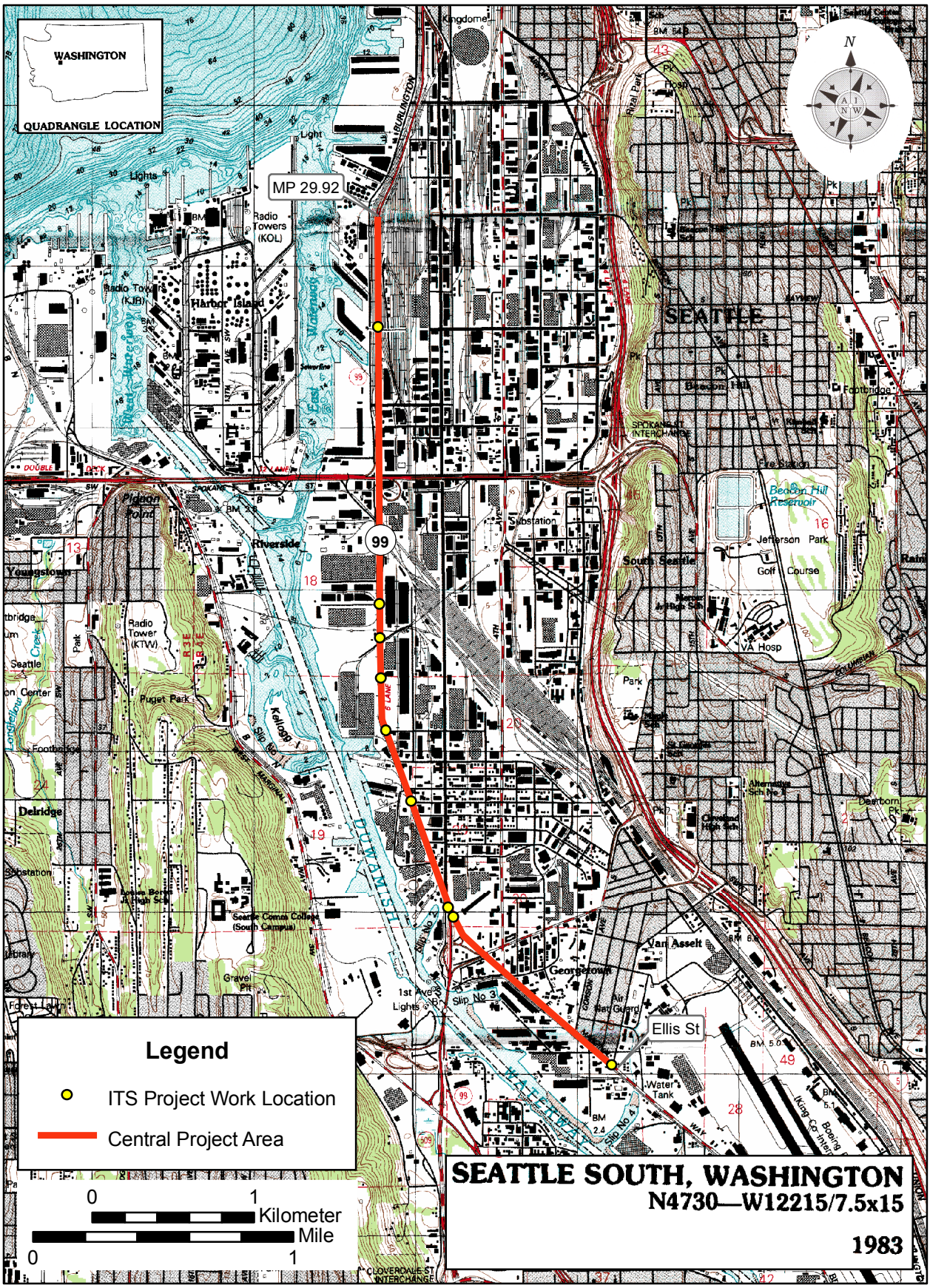


Figure 3. SR 99 Intelligent Transportation Systems Improvement Project construction locations within the Central Section of the project area.

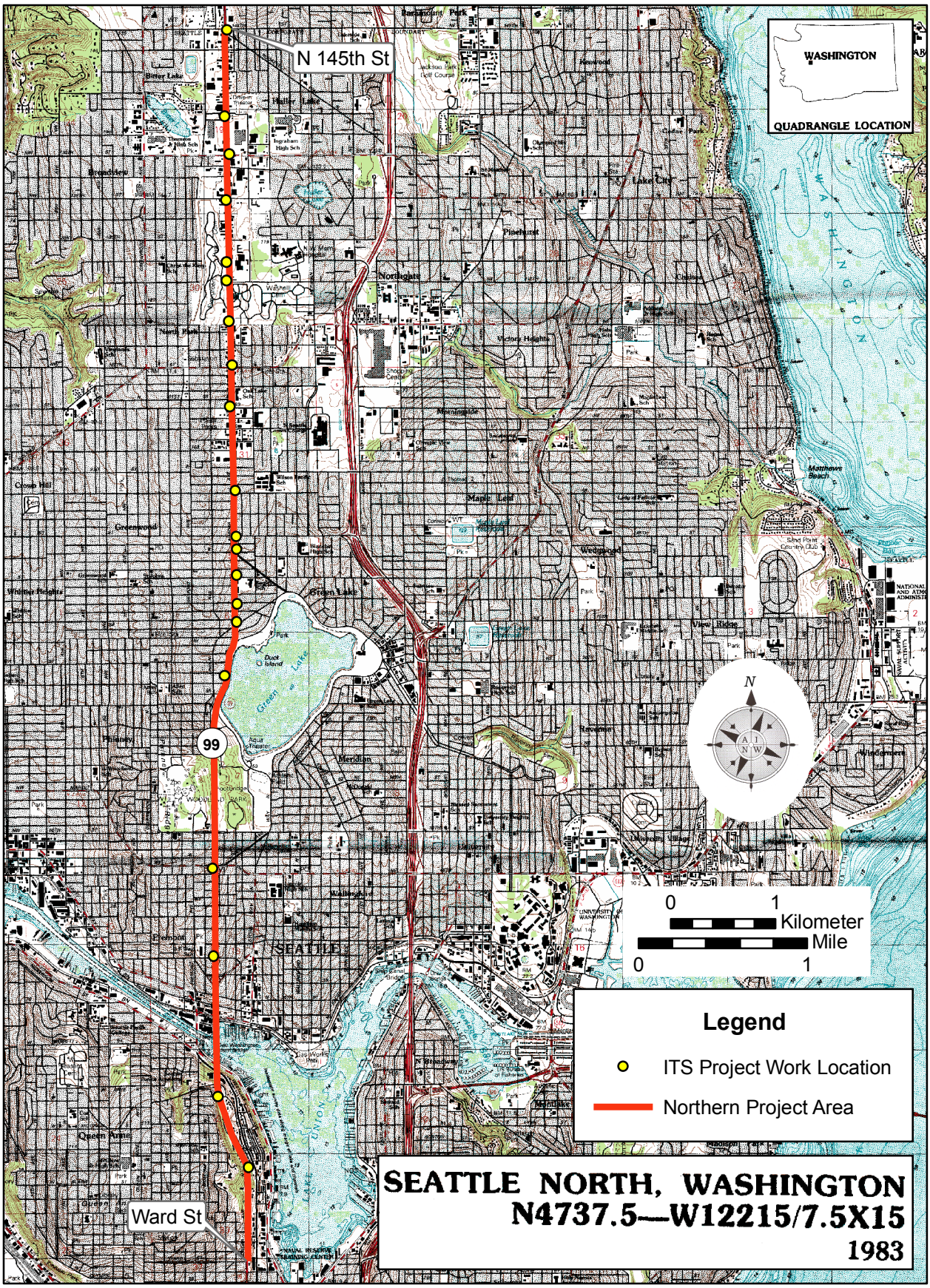


Figure 4. SR 99 Intelligent Transportation Systems Improvement Project construction locations within the Northern Section of the project area.

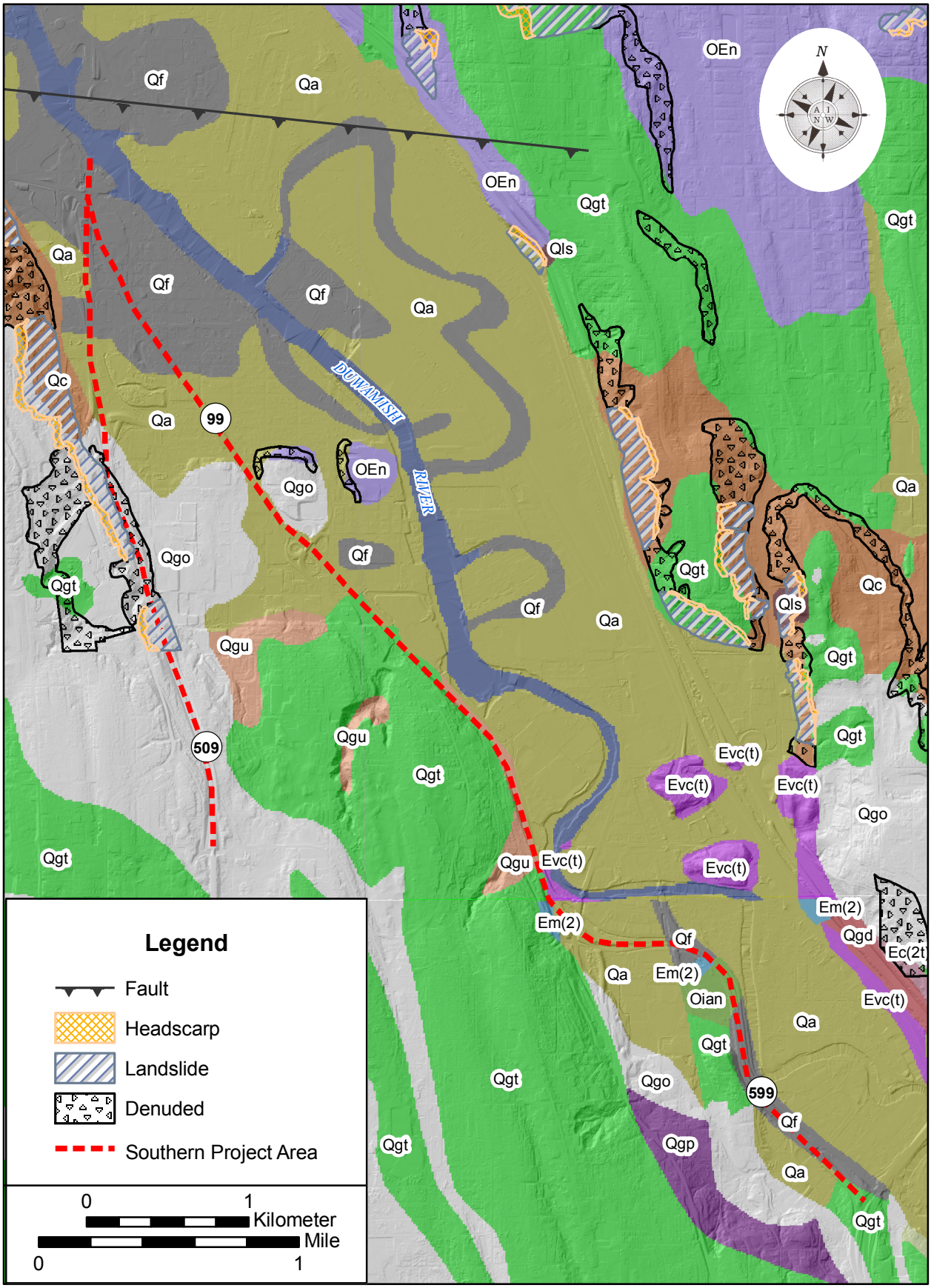


Figure 5. SR 99 Intelligent Transportation Systems Improvement Project Southern Section geomorphic setting. See Table 1 for geologic unit key.

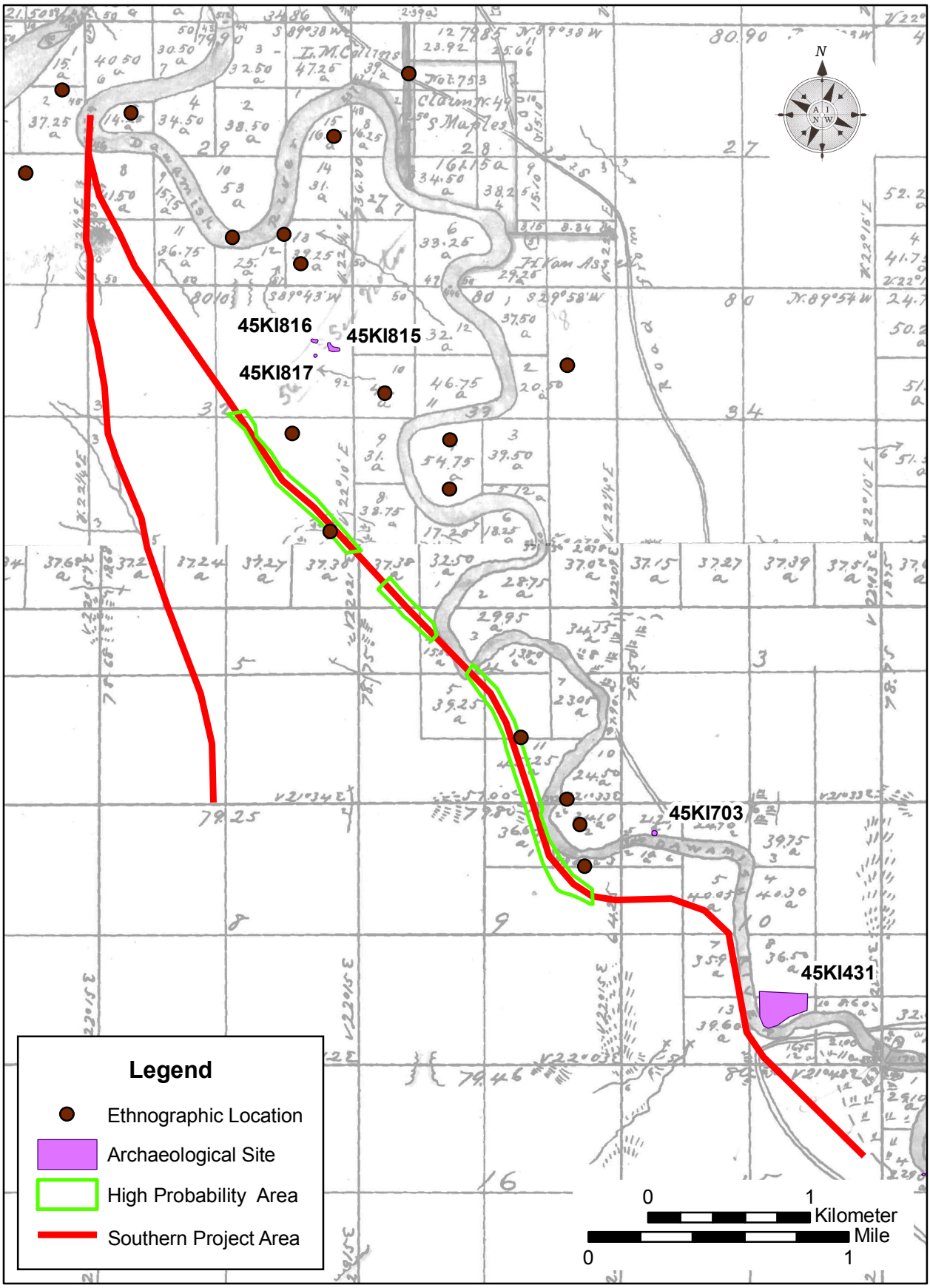


Figure 6. SR 99 Intelligent Transportation Systems Improvement Project Southern Section showing archaeological and ethnographic locations overlaid on two 1862 General Land Office (GLO) maps.

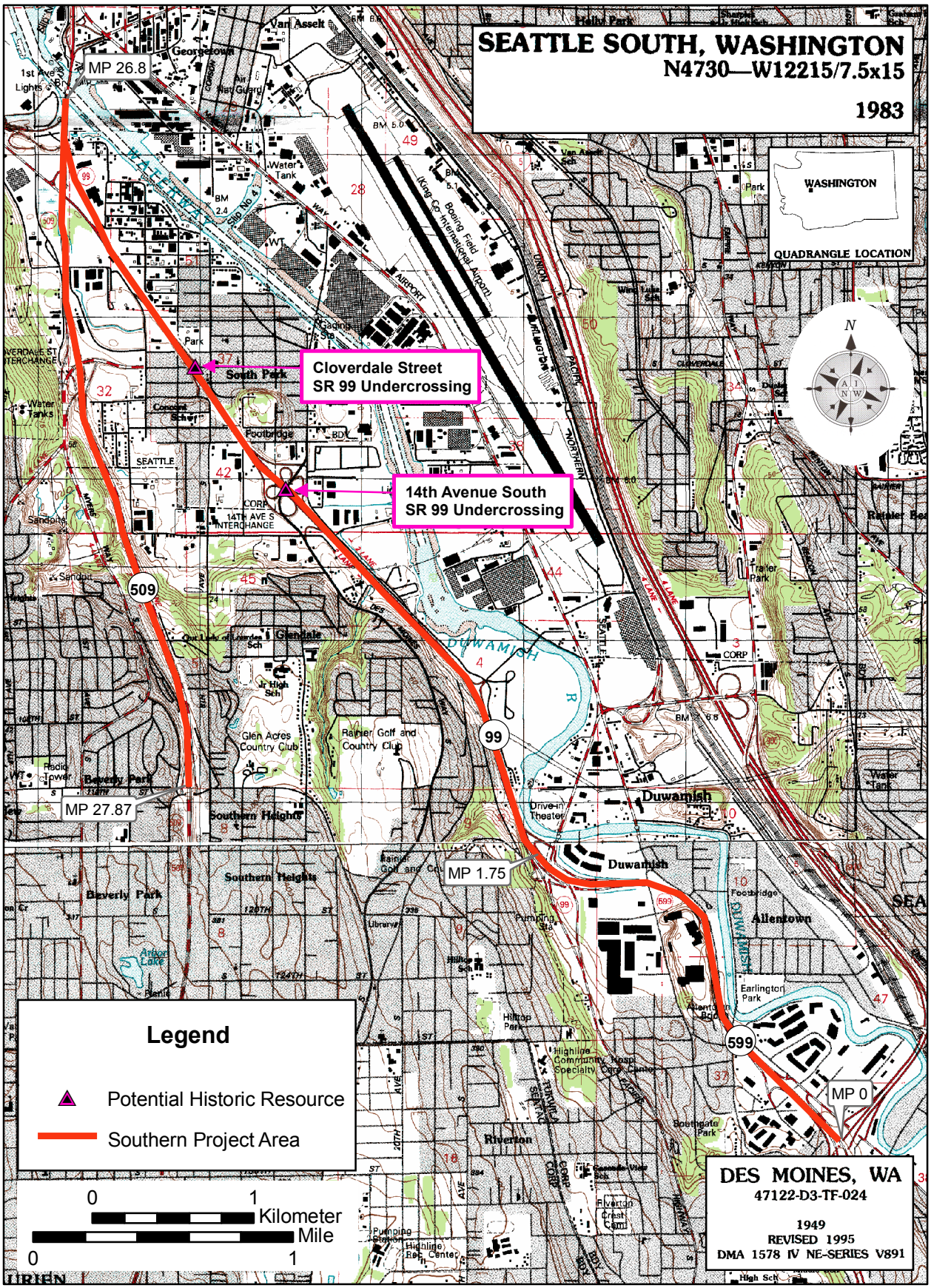


Figure 7. SR 99 Intelligent Transportation Systems Improvement Project previously identified historic resources within the Southern Section of the project area.

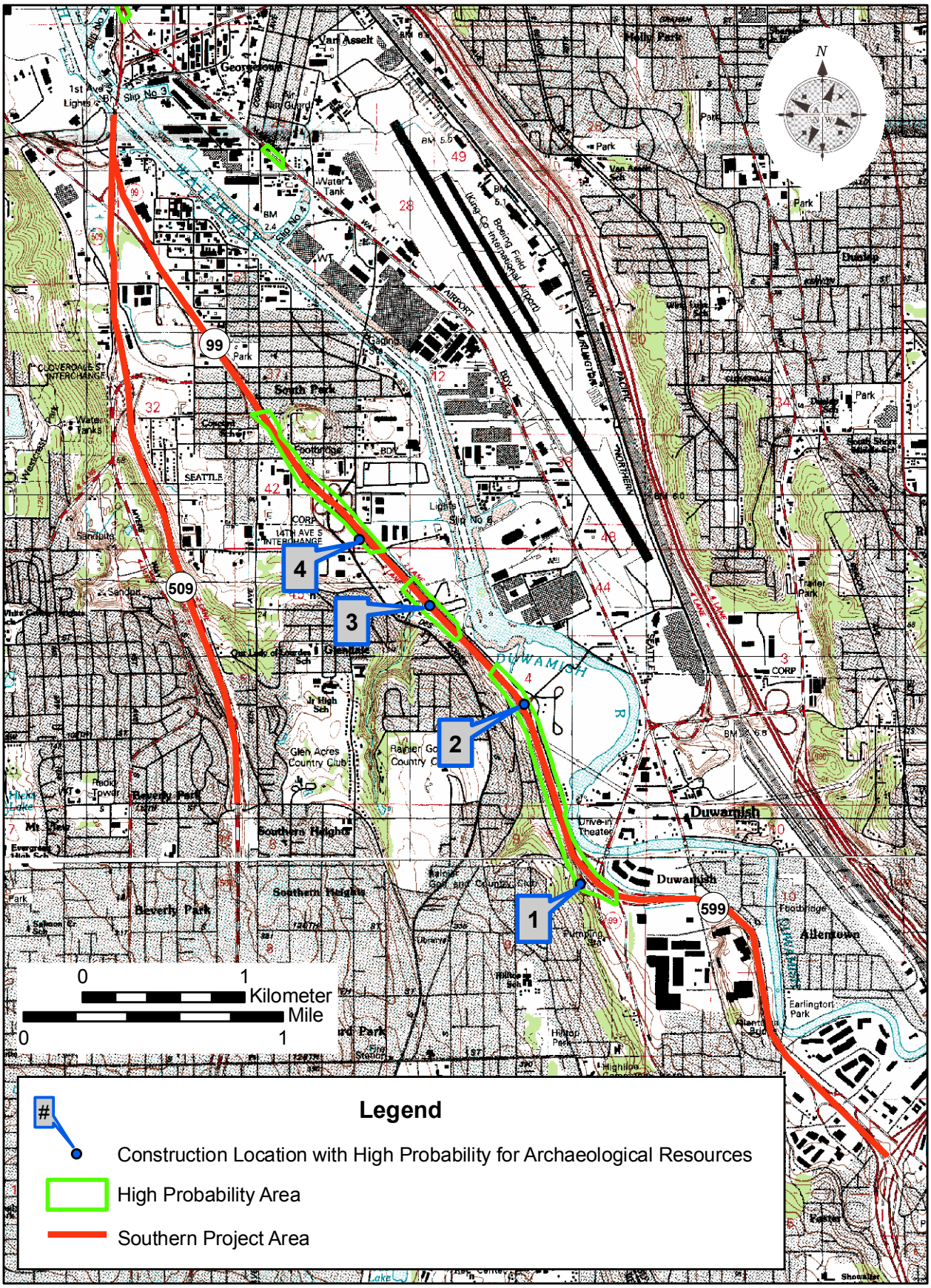


Figure 8. SR 99 Intelligent Transportation Systems Improvement Project Southern Section archaeological high probability areas (HPAs) at proposed construction work locations.

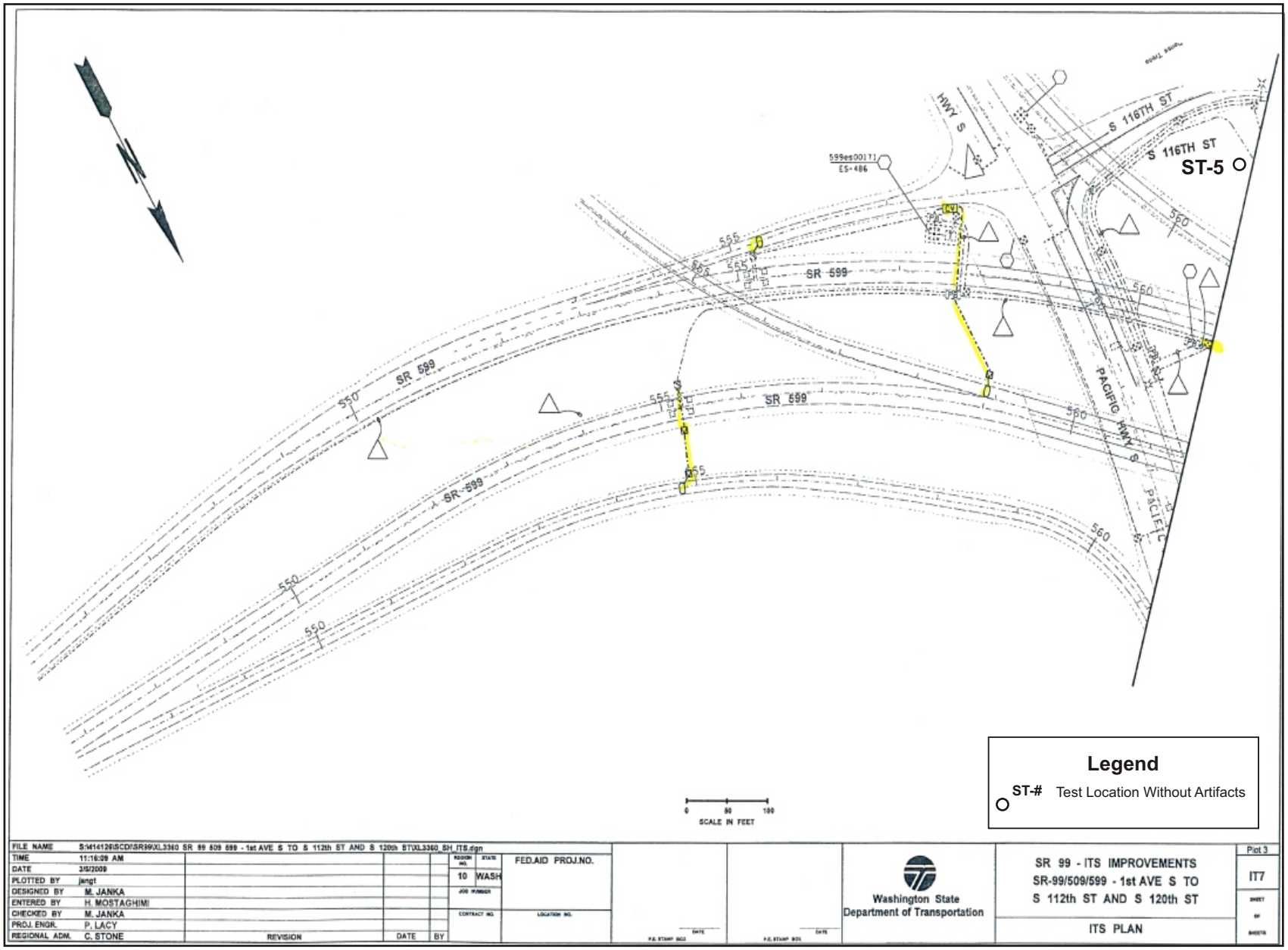


Figure 9a. High Probability Area (HPA) Location 1 showing the position of shovel test.

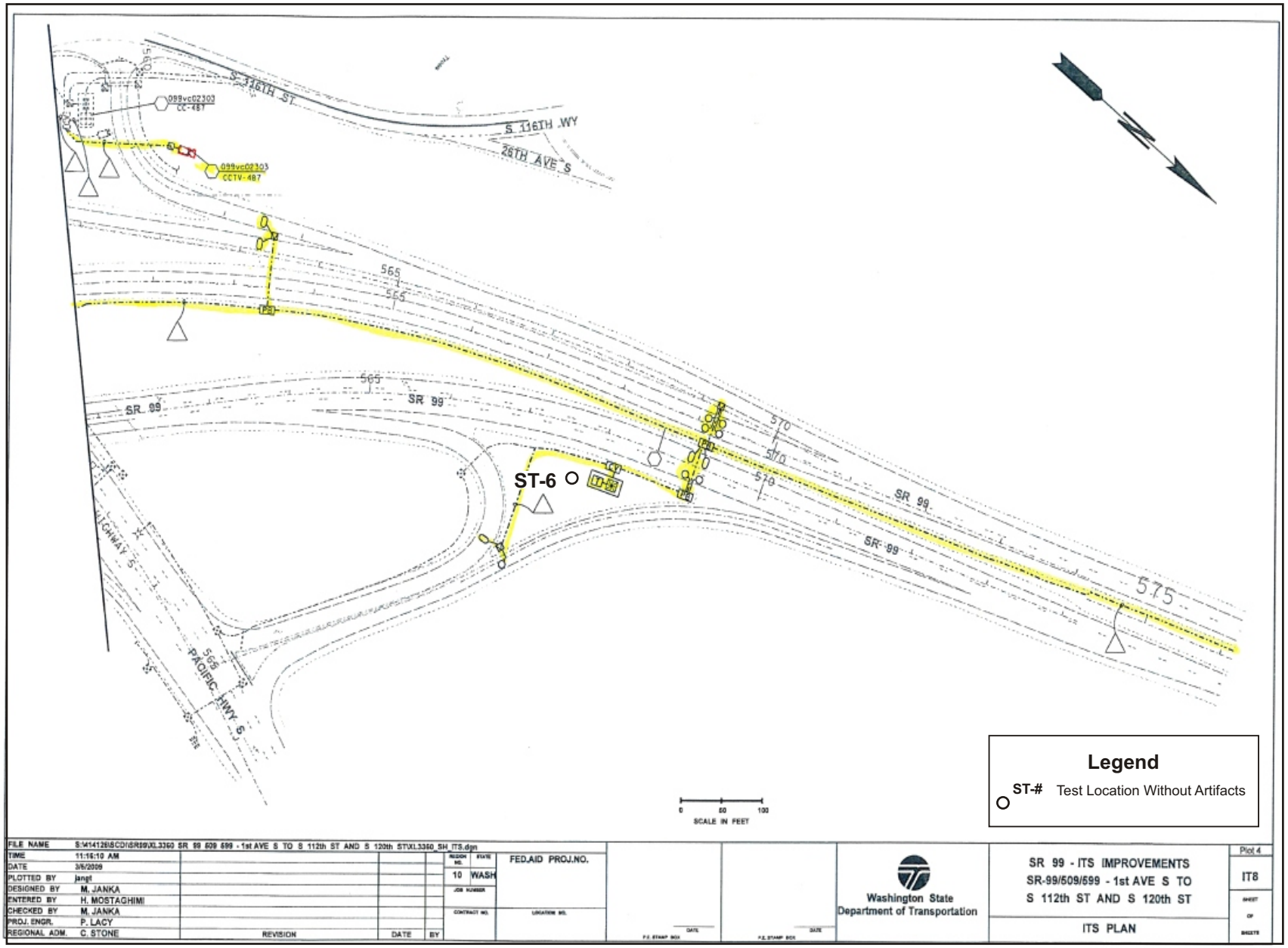


Figure 9b. High Probability Area (HPA) Location 1 showing the position of shovel test.

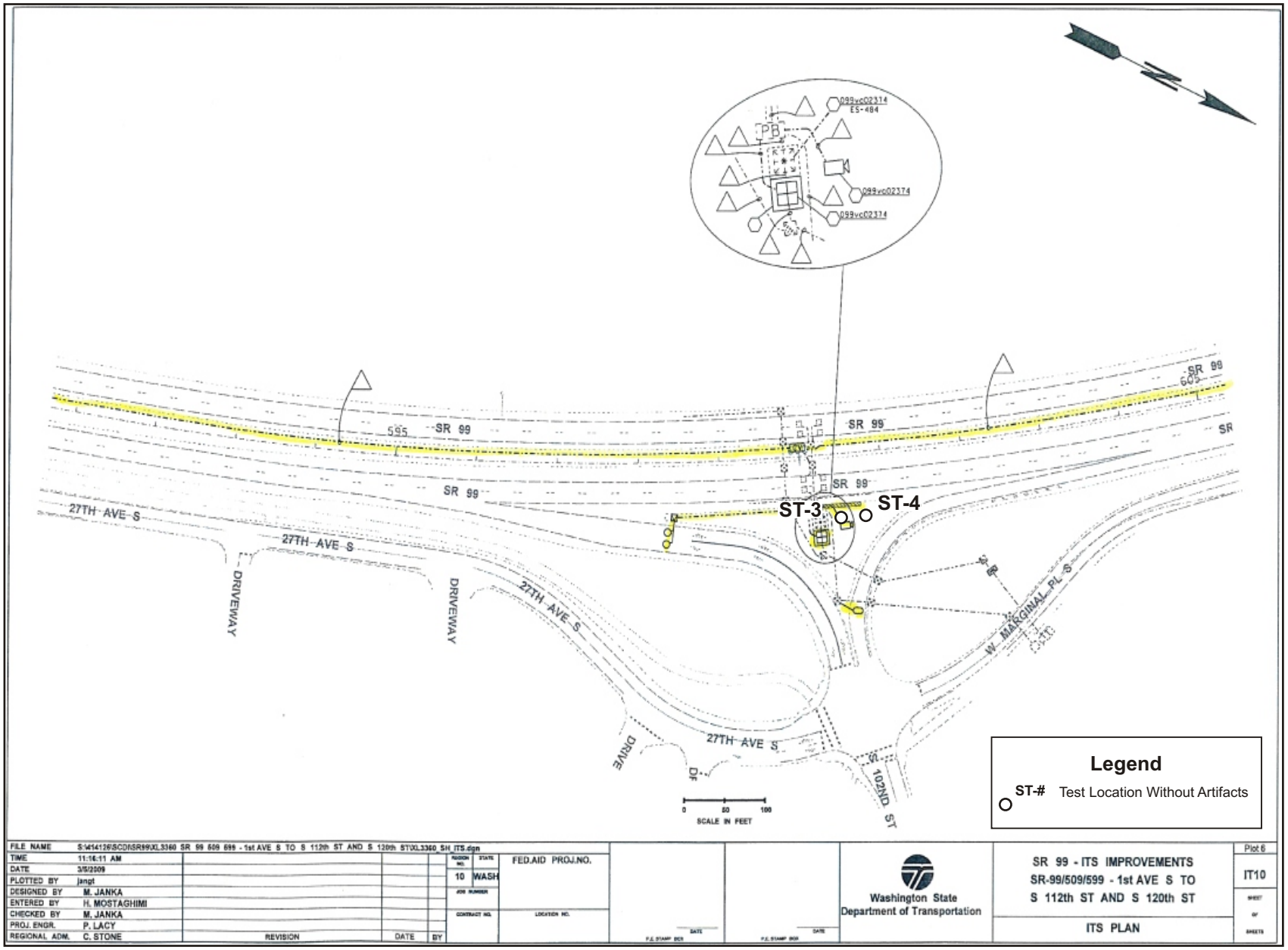


Figure 10. High Probability Area (HPA) Location 2 showing the position of shovel tests.

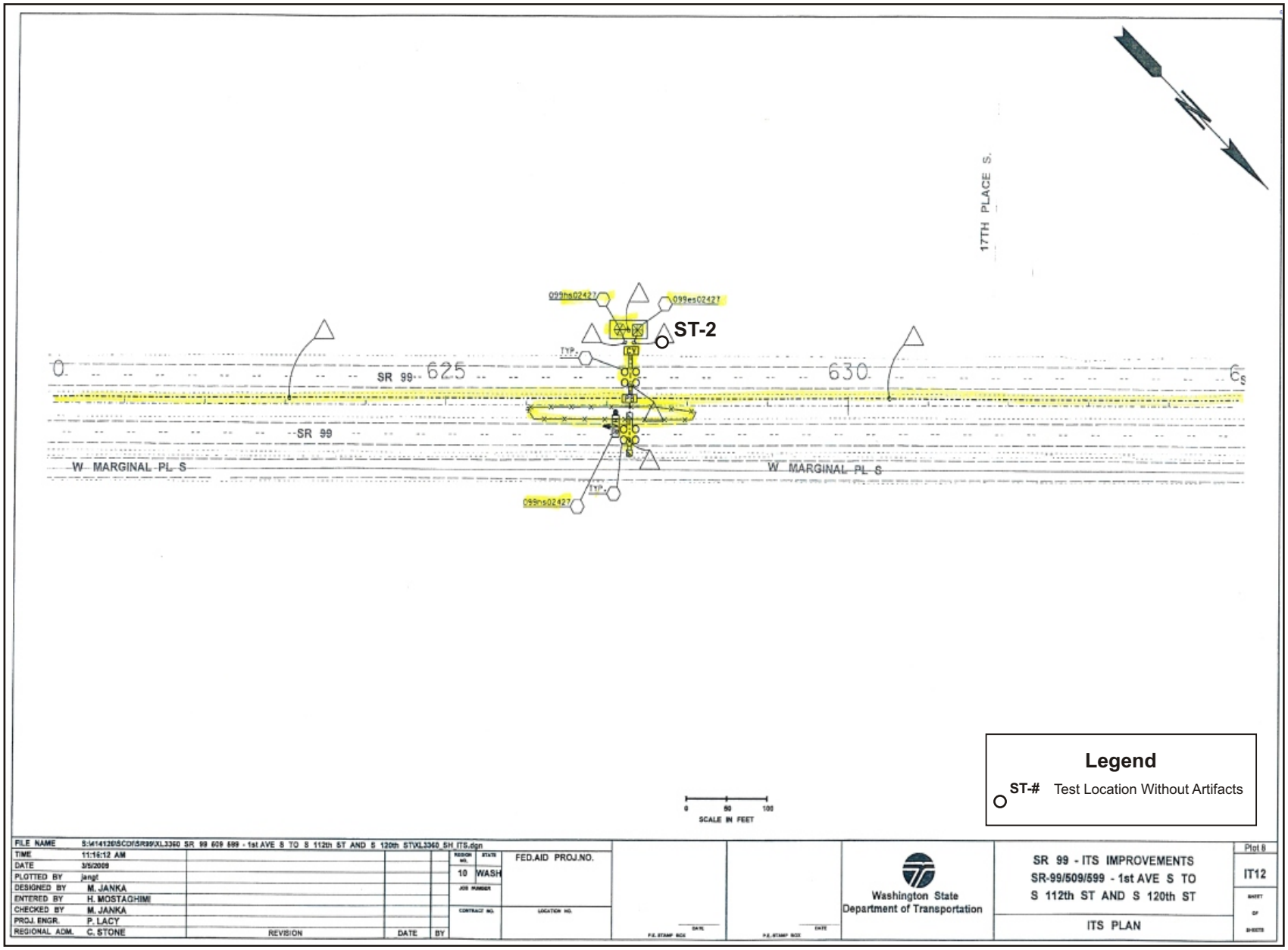


Figure 11. High Probability Area (HPA) Location 3 showing the position of shovel test.

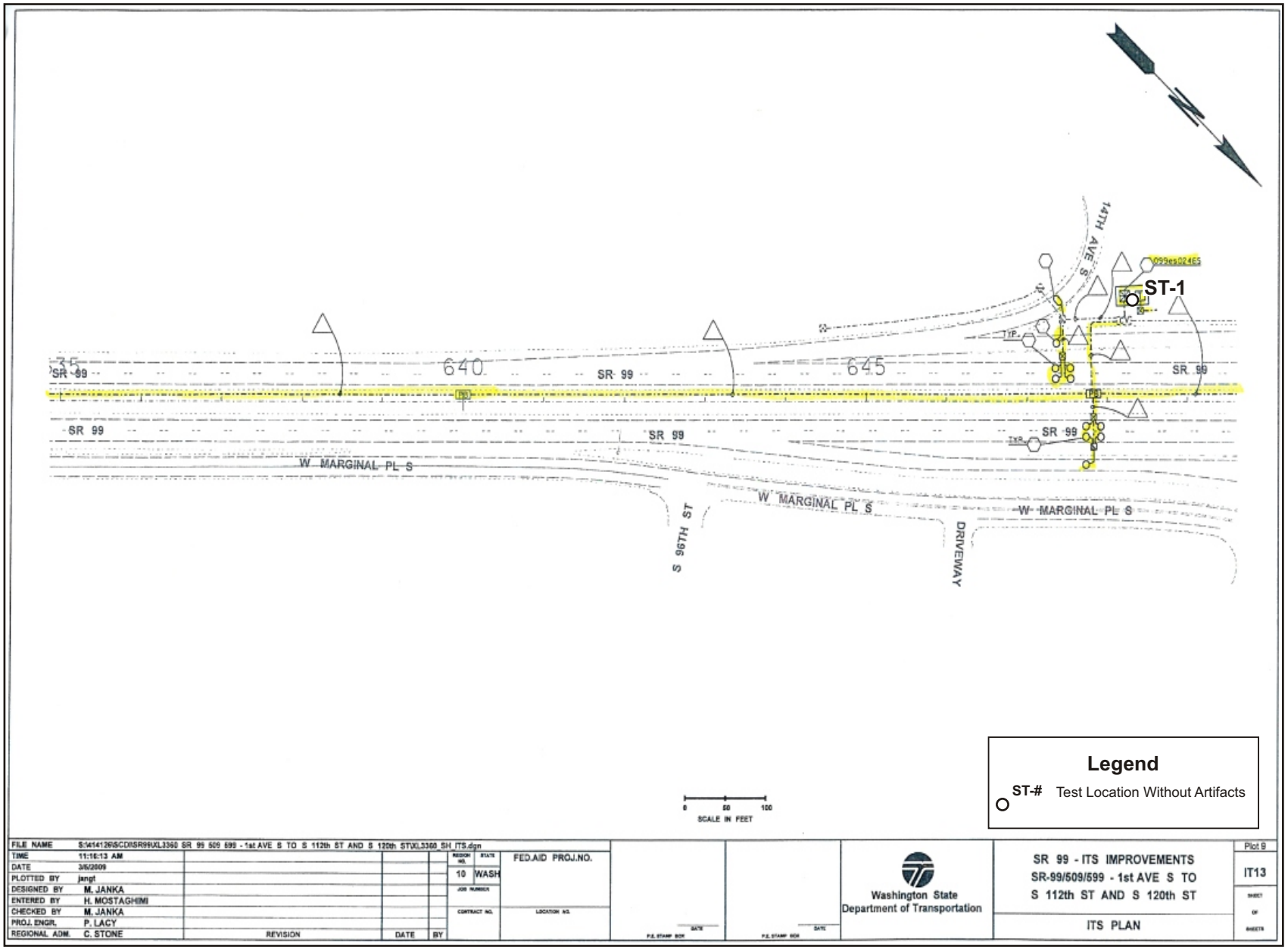


Figure 12. High Probability Area (HPA) Location 4 showing the position of shovel test.

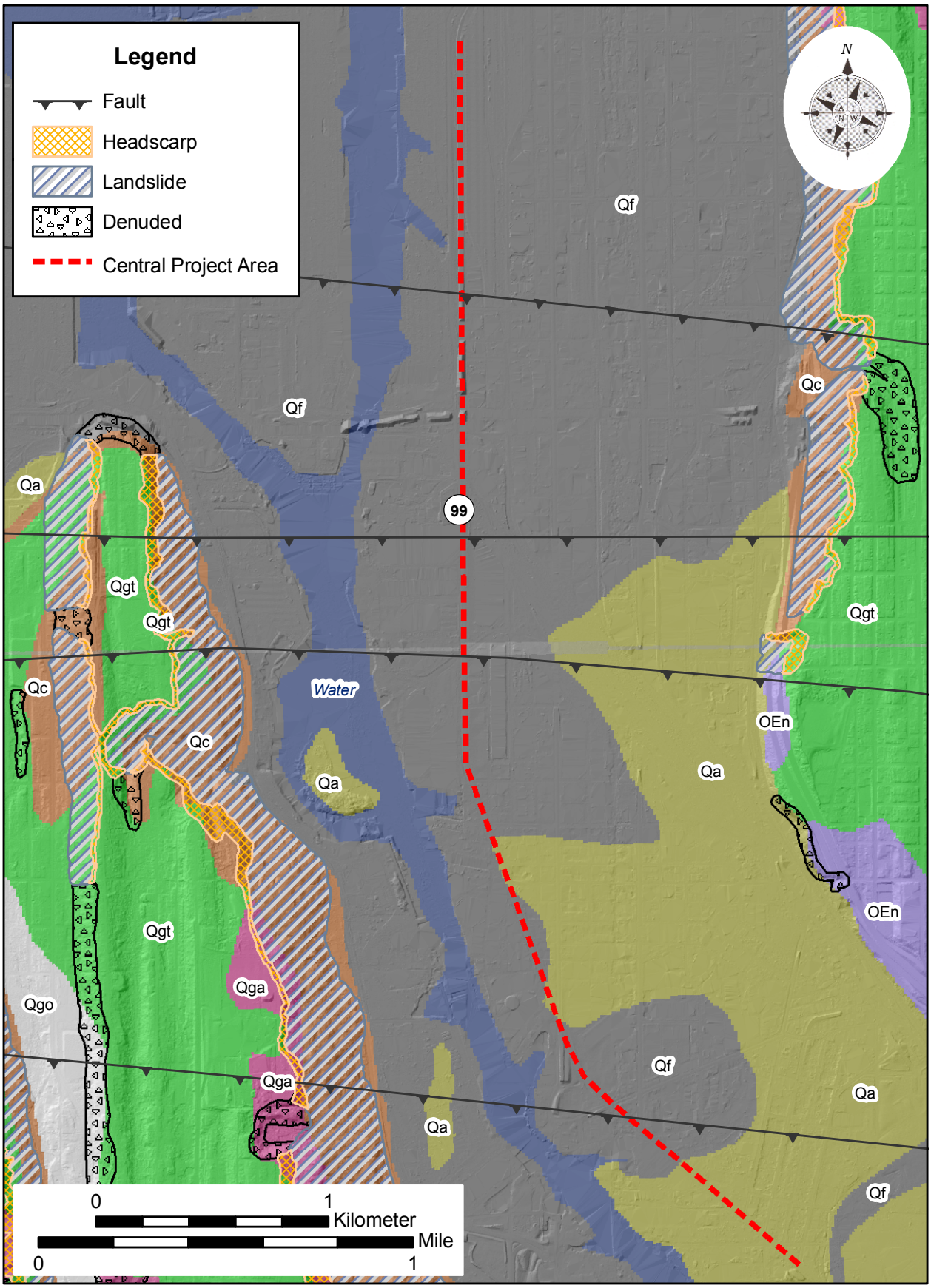


Figure 13. SR 99 Intelligent Transportation Systems Improvement Project Central Section geomorphic setting. See Table 1 for geologic unit key.

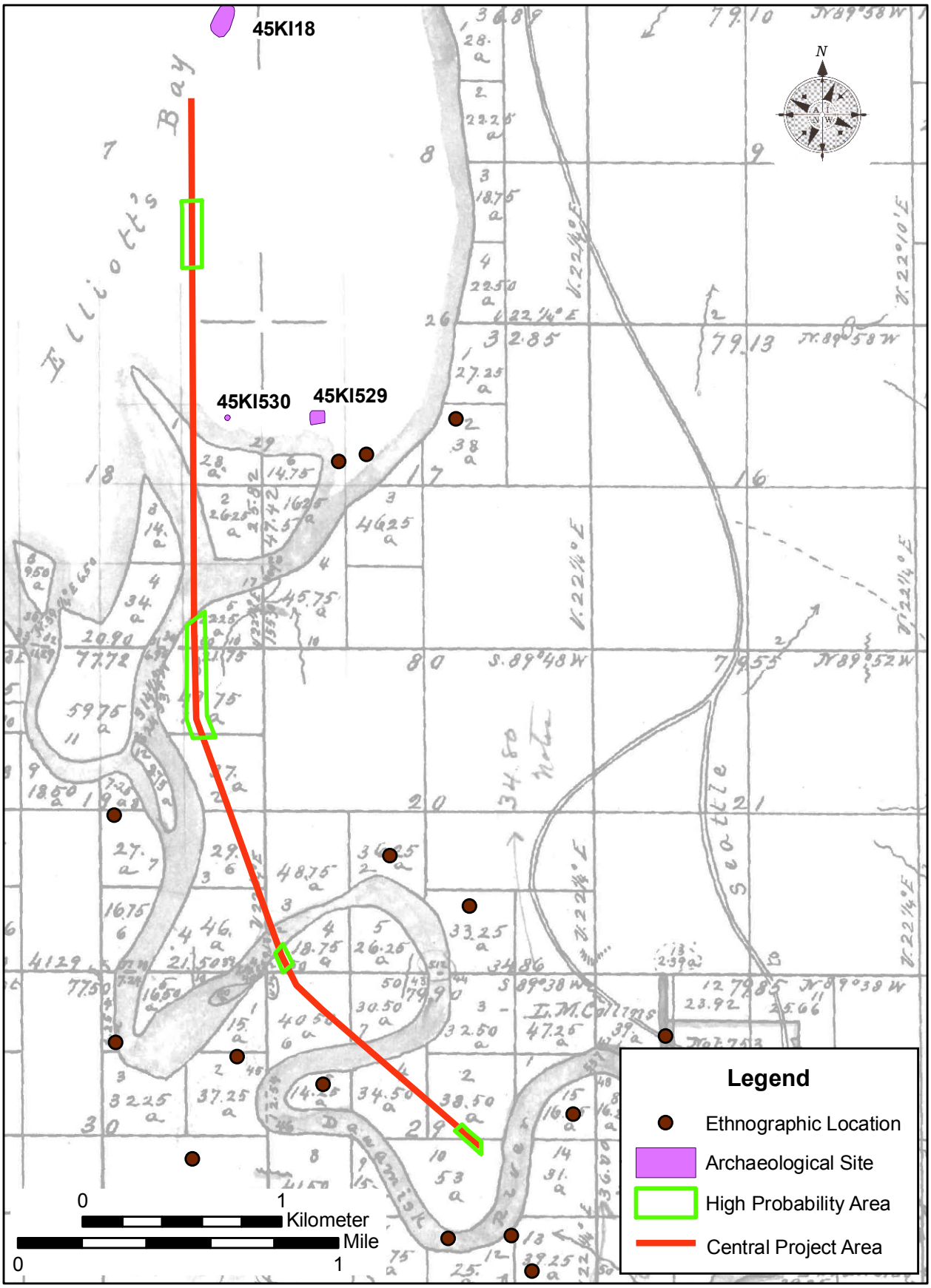


Figure 14. SR 99 Intelligent Transportation Systems Improvement Project Central Section showing archaeological and ethnographic locations overlaid on an 1862 General Land Office (GLO) map.

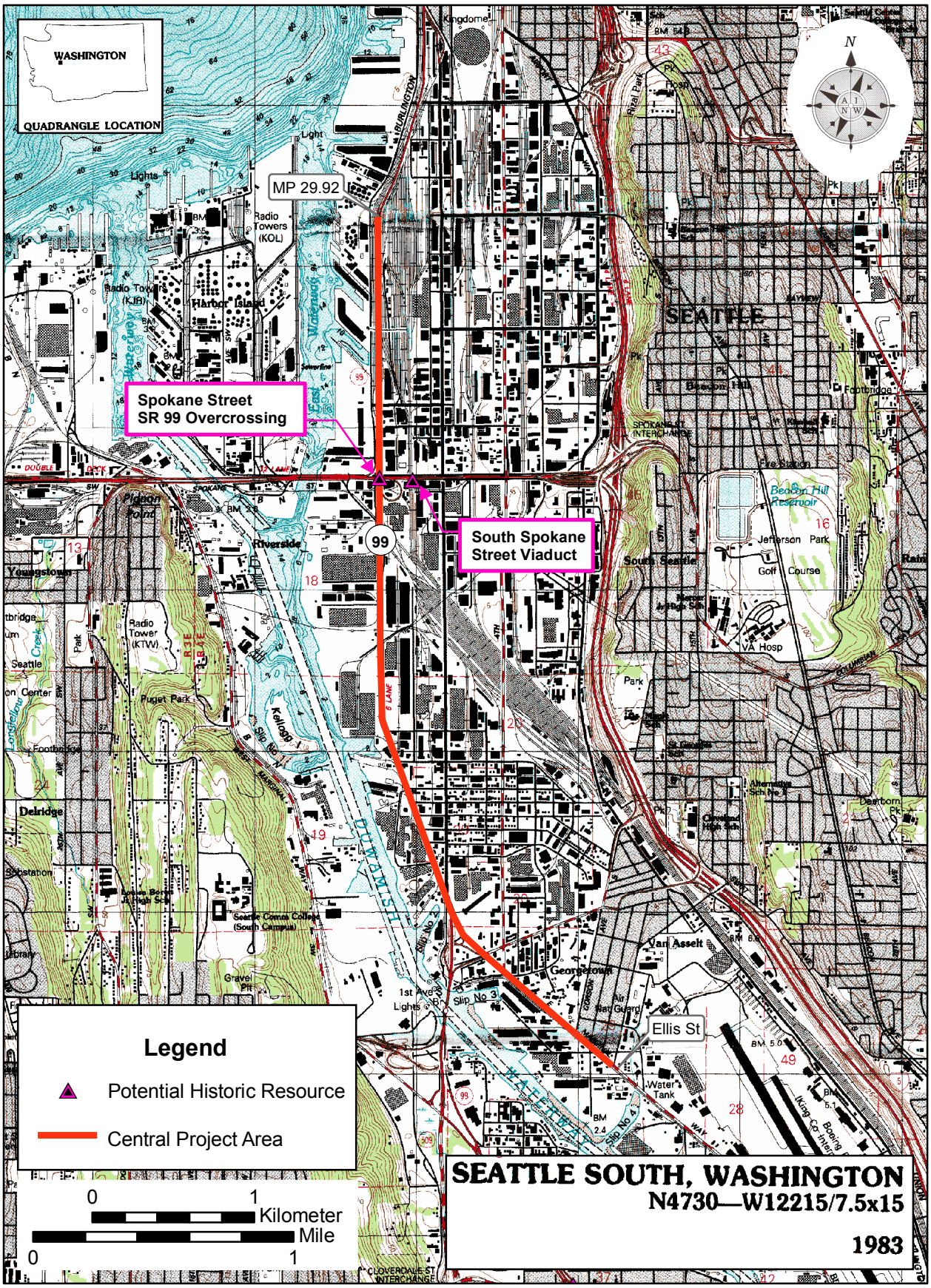


Figure 15. SR 99 Intelligent Transportation Systems Improvement Project previously identified historic resources within the Central Section of the project area.

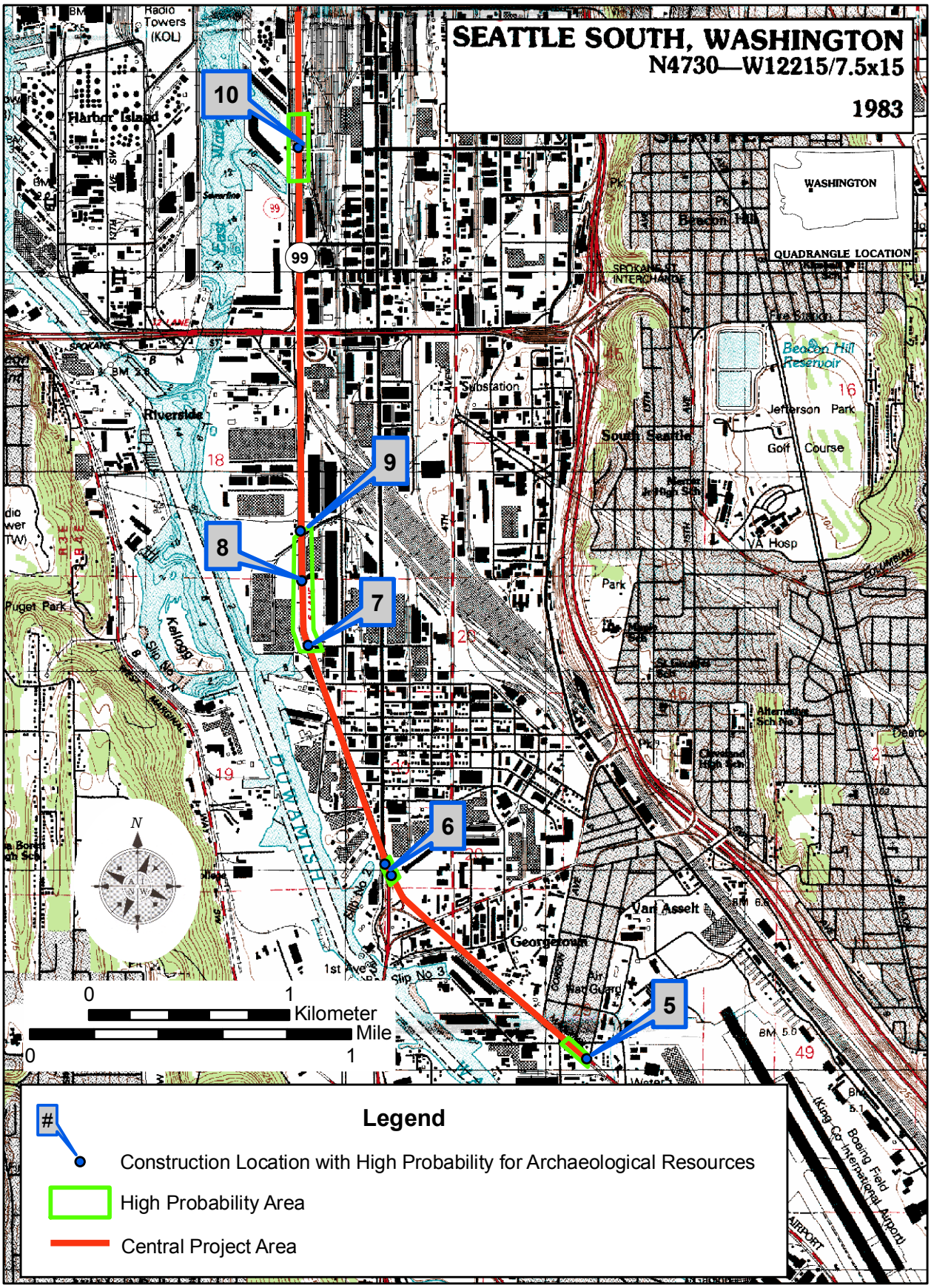


Figure 16. SR 99 Intelligent Transportation Systems Improvement Project Central Section archaeological high probability areas (HPAs) at proposed construction work locations.

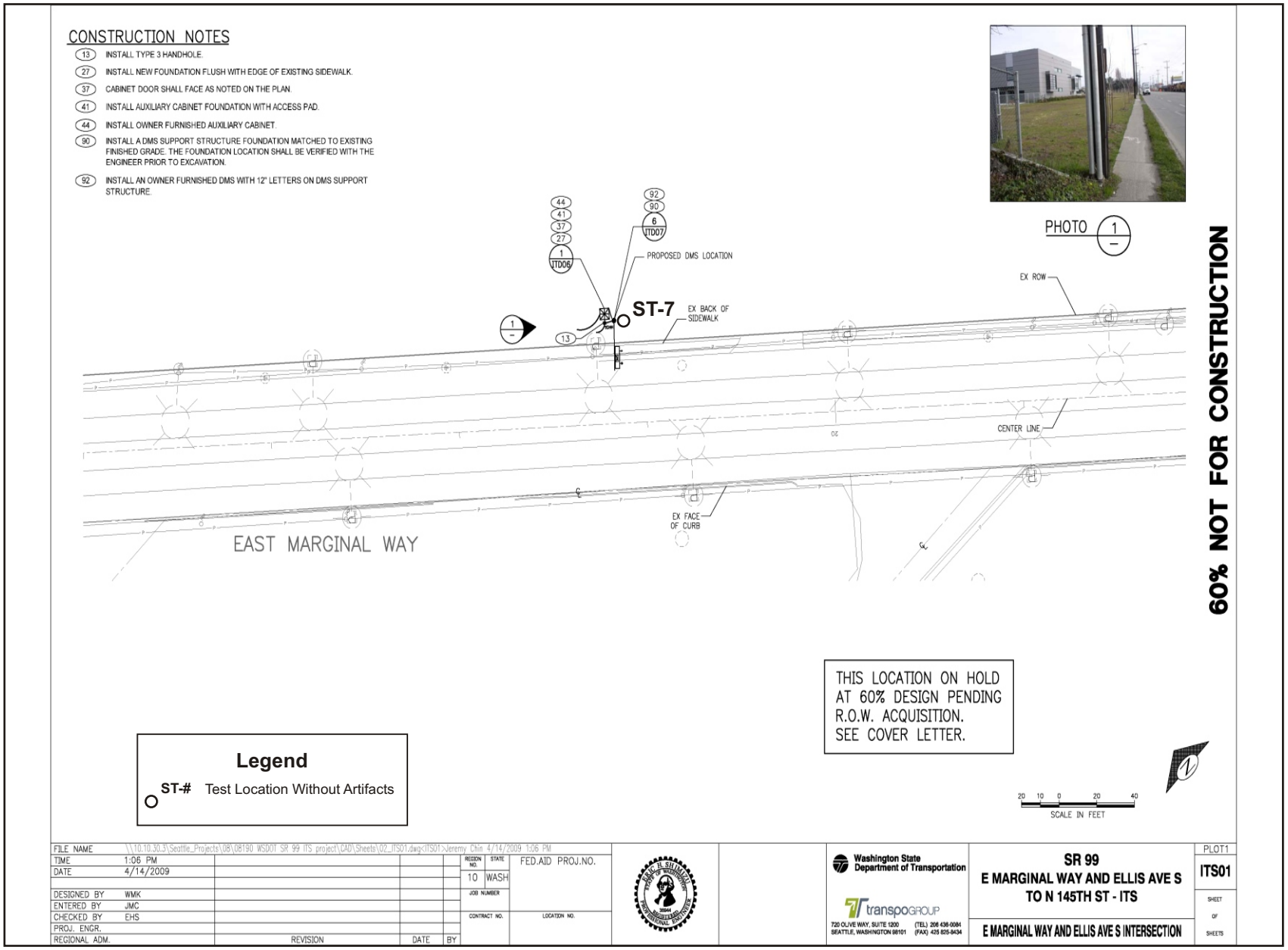


Figure 17. High Probability Area (HPA) Location 5 showing the position of shovel test.

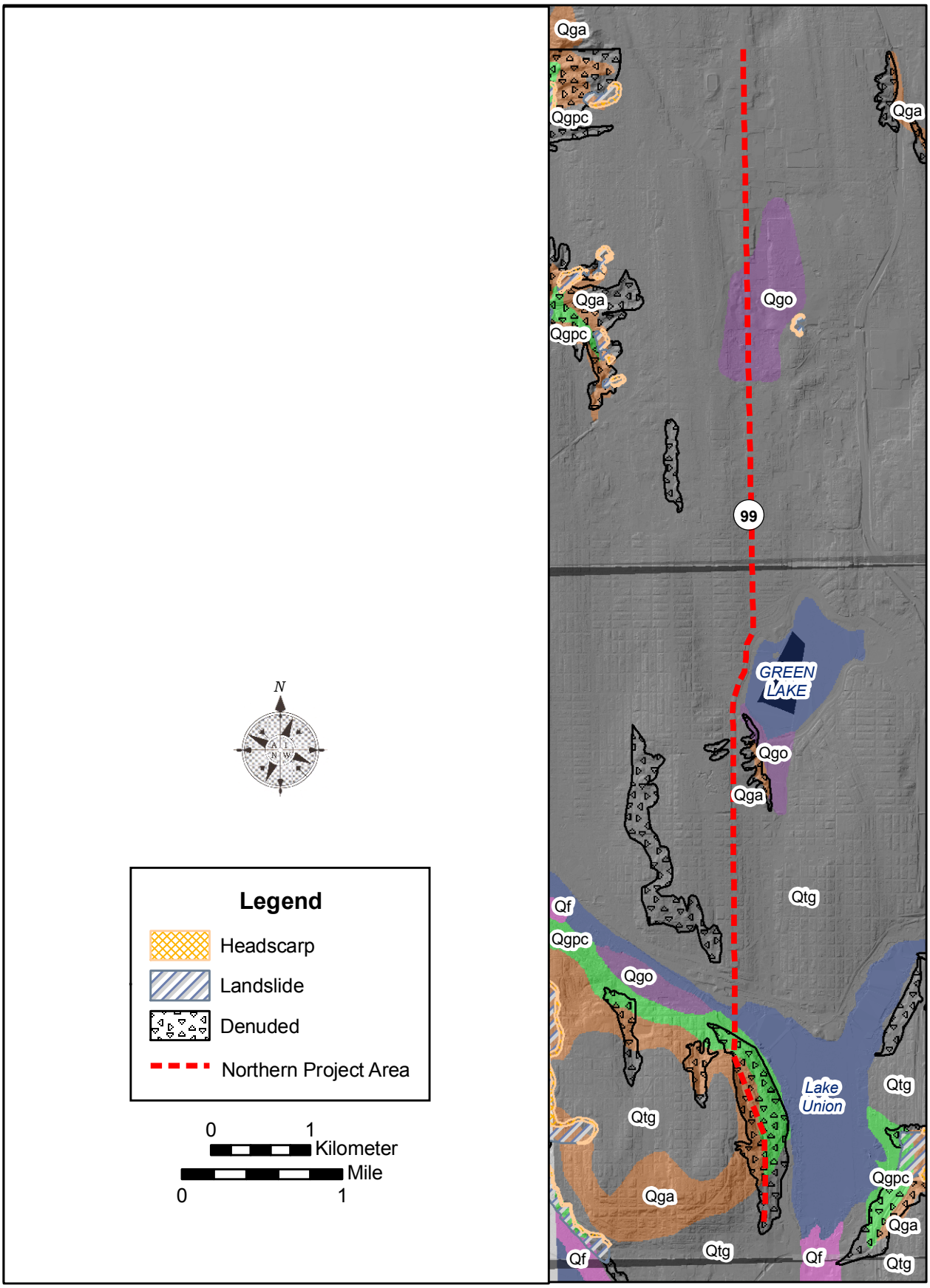


Figure 18. SR 99 Intelligent Transportation Systems Improvement Project Northern Section geomorphic setting. See Table 1 for geologic unit key.

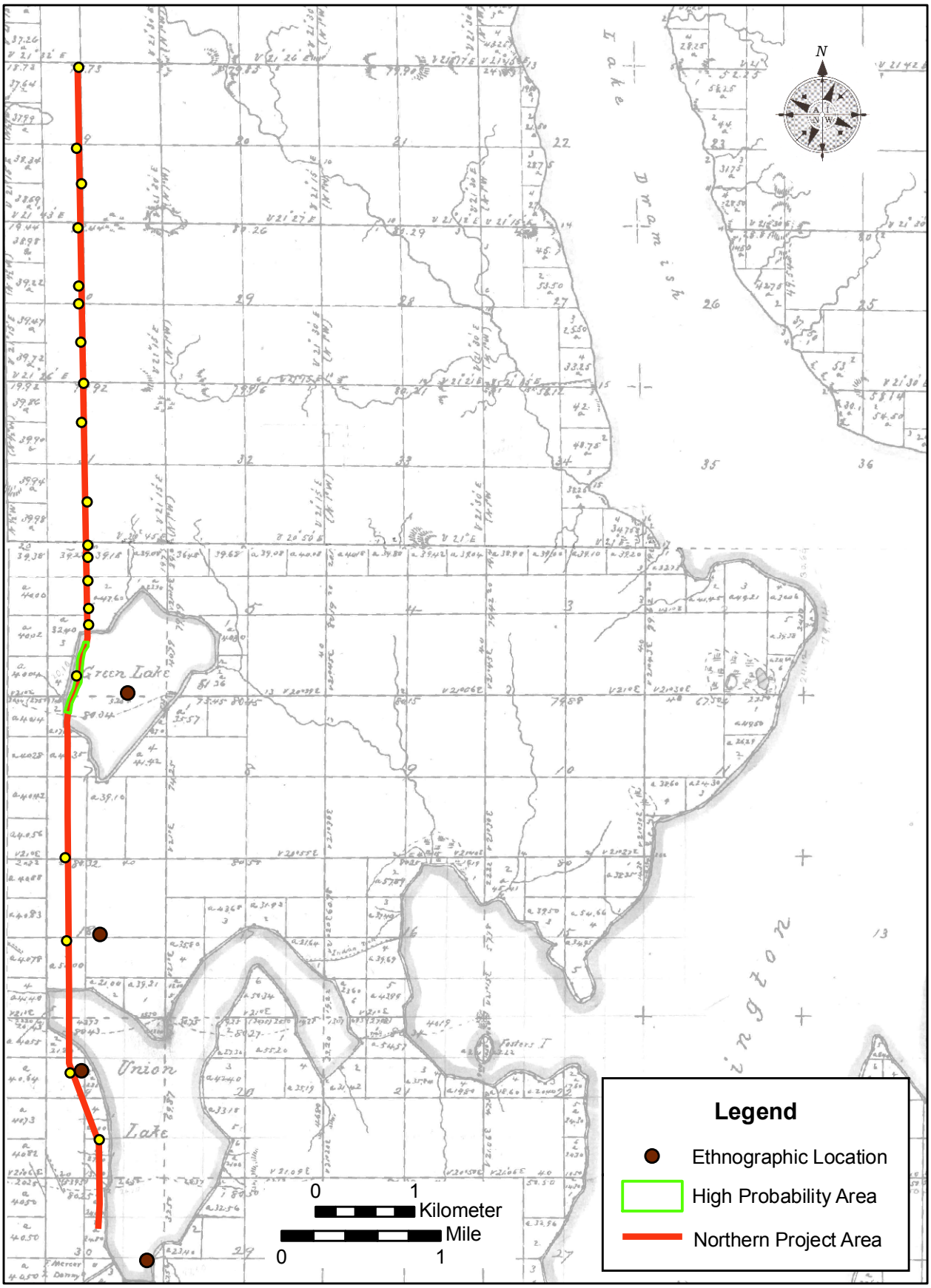


Figure 19. SR 99 Intelligent Transportation Systems Improvement Project Northern Section showing ethnographic locations overlaid on 1856 and 1859 General Land Office (GLO) maps.

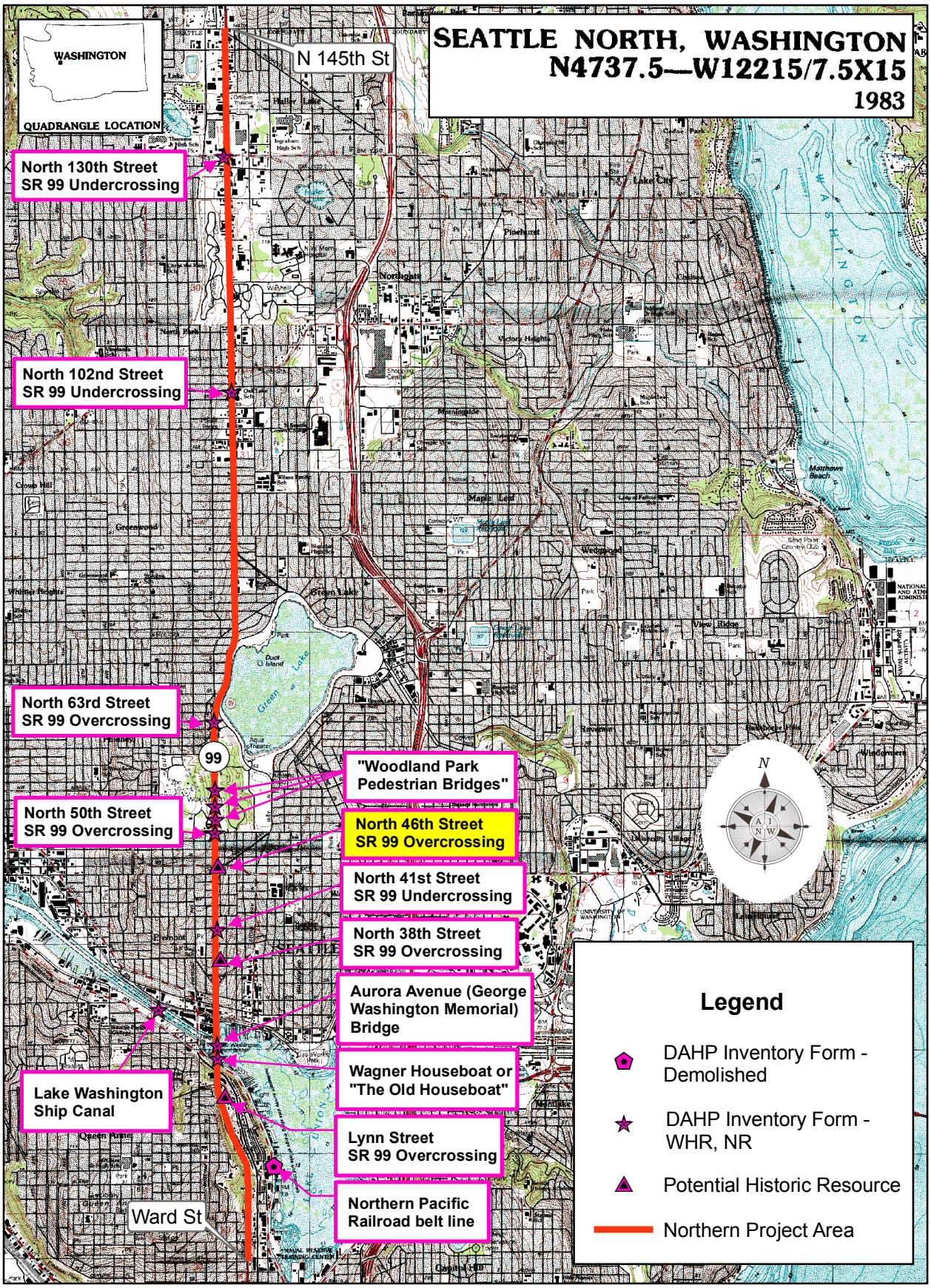


Figure 20. SR 99 Intelligent Transportation Systems Improvement Project previously identified historic resources within the Northern Section of the project area. Yellow shaded resources are older than 50 years, and within 200 feet of a work area.

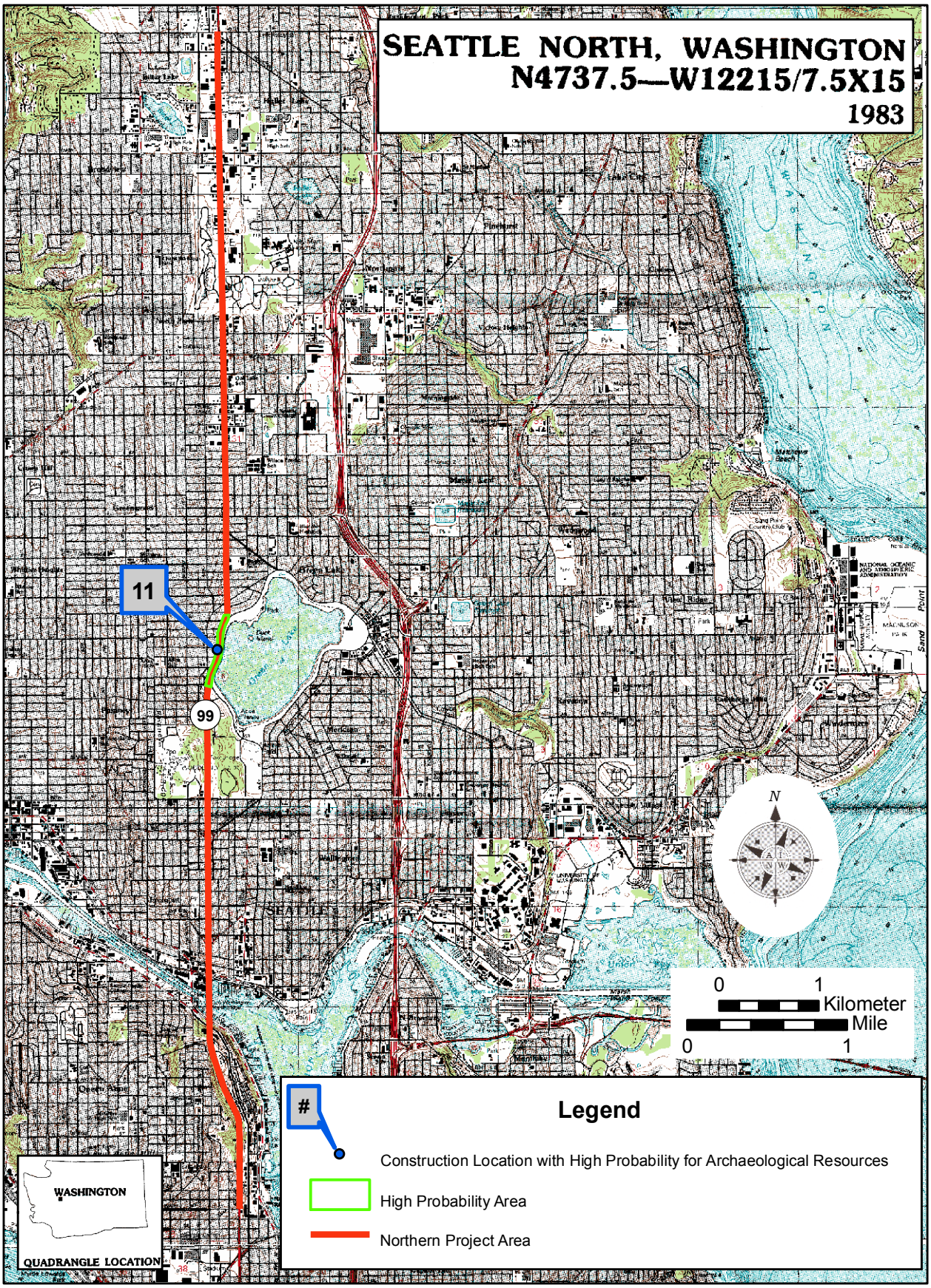


Figure 21. SR 99 Intelligent Transportation Systems Improvement Project Northern Section archaeological high probability areas (HPAs) at proposed construction work locations.

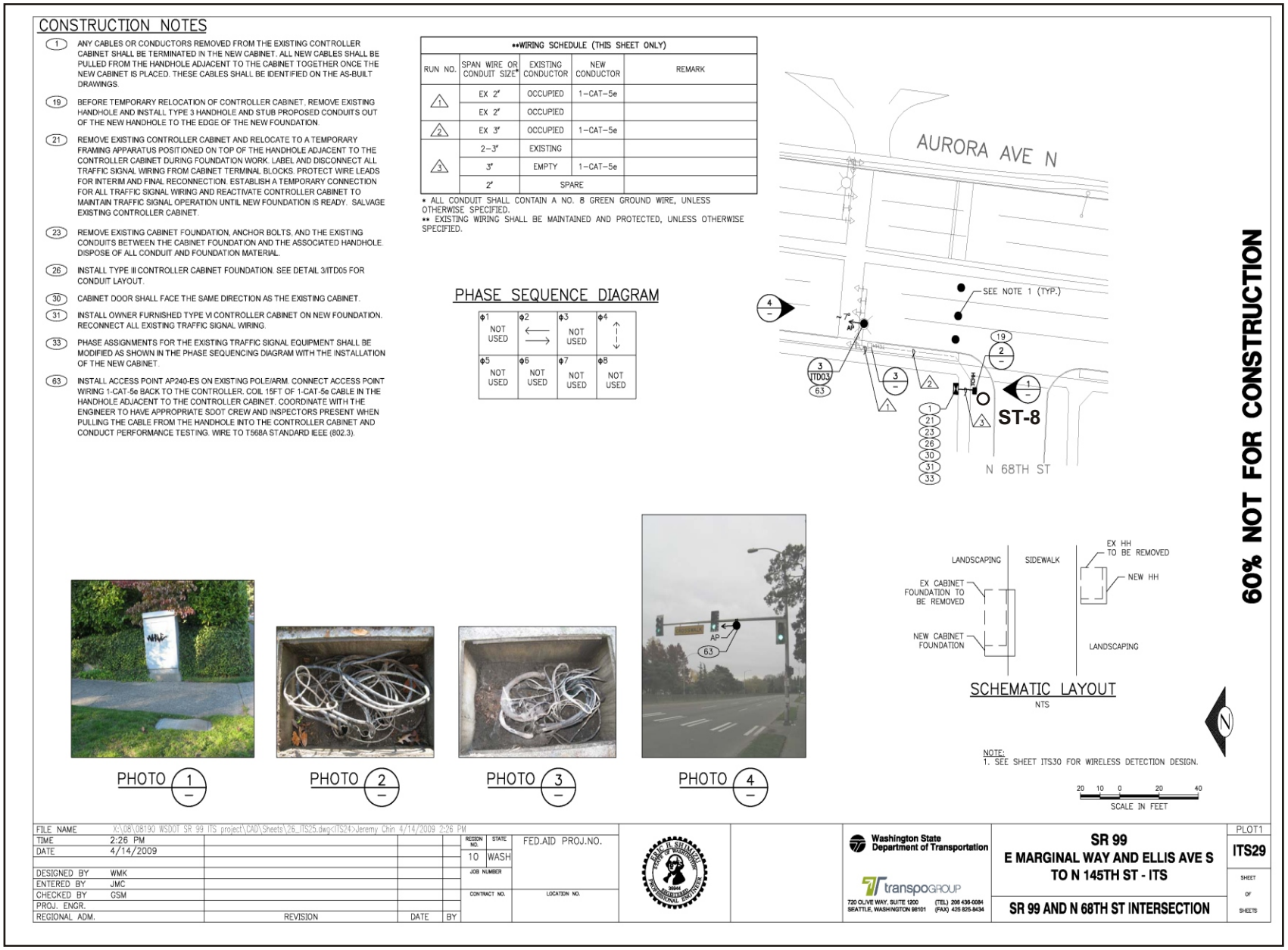
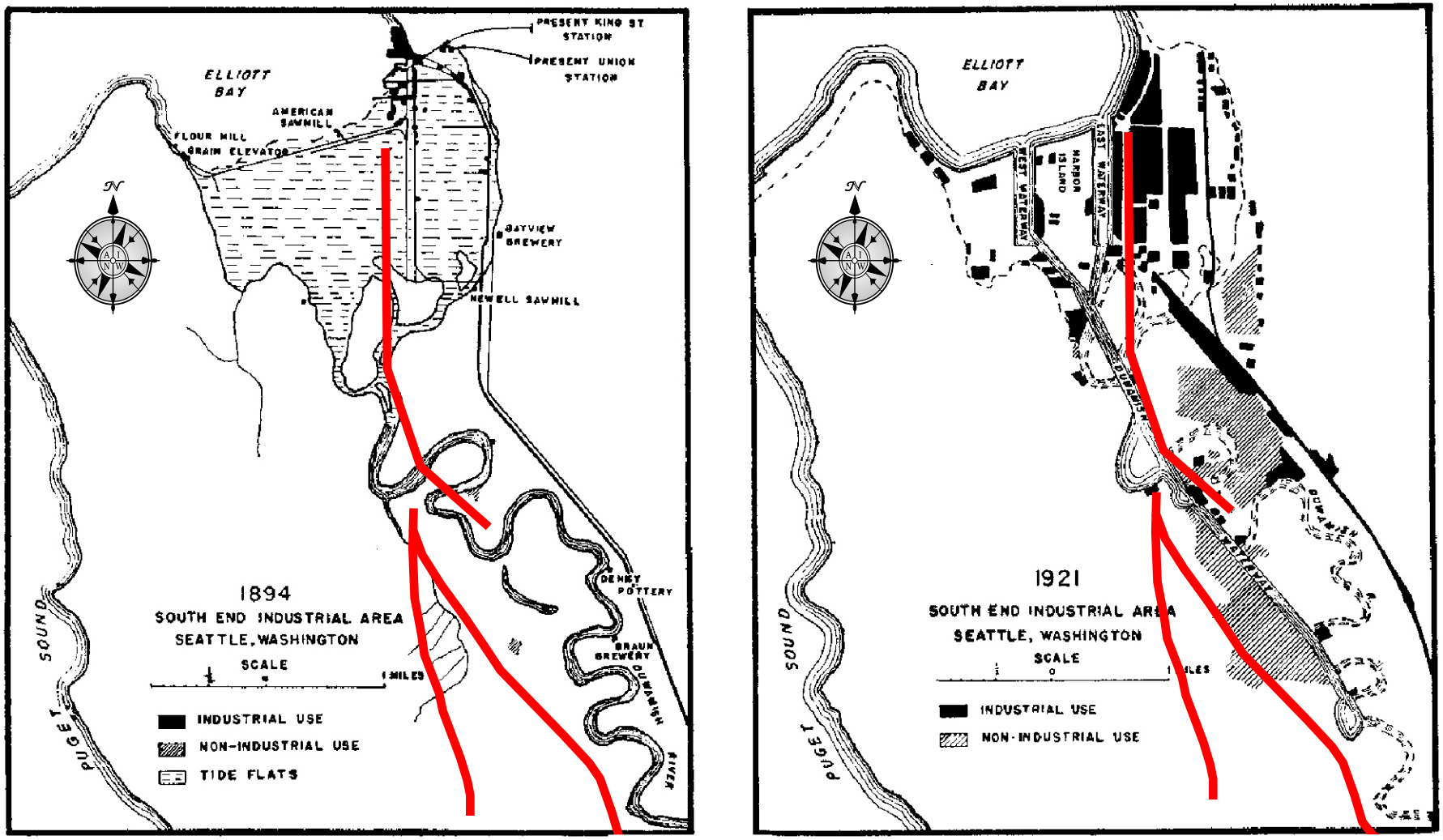


Figure 22. High Probability Area (HPA) Location 11 showing the position of shovel test.



0 5 km

0 5 mi

Figure 23. Portions of the SR 99 ITS Improvements Project Central and Southern Sections overlaid onto historical maps (modified from Carlson 1950: Figure 3 and Figure 4). The map on the left depicts the tide flats of Elliot Bay and the Dumamish River in its original alignment. The map on the right shows the same area after the infilling of the tide flats, the construction of Harbor Island, and the dredging and straightening of the Duwamish River in the early 1890s and early 1900s.

Appendix A

Photos

Photo 1. Overview of Location 1 with the Duwamish River in the foreground. The view is to the southwest.

Photo 2. Overview of Location 1 showing the amount of fill sediment placed in the location during the construction of the interchange. The view is to the northwest.

Photo 3. Overview of proposed work area at Location 1 showing height of fill sediment. Original height of landform is shown in the right foreground. The view is to the northeast.

Photo 4. Shovel testing at Location 1 (ST-5). The view is to the north.

Photo 5. Shovel testing at Location 1 (ST-6). The view is to the northwest.

Photo 6. Overview of shovel testing at Location 2 (ST-3). The view is to the west.

Photo 7. End of excavation of ST-3 due to a gravel layer at 30 cm (12 in) below the surface. The trowel is pointing to the north.

Photo 8. Overview of Location 3. The view is to the north.

Photo 9. Shovel testing at Location 3 (ST-2). The view is to the south.

Photo 10. Shovel testing at Location 4. The view is to the northeast.

Photo 11. Shovel testing at Location 5. The view is to the southeast.

Photo 12. Overview of Location 6. The view is to the north.

Photo 13. Overview of Location 7. The view is to the north.

Photo 14. Overview of Location 8. The view is to the east.

Photo 15. Overview of Location 9 on the west side of SR 99. The view is to the east.

Photo 16. Overview of Location 9 on the east side of SR 99. The view is to the south.

Photo 17. Overview of Location 10. The view is to the south.

Photo 18. Shovel testing at Location 11 showing Green Lake in the background. The view is to the east.

Appendix B

Historic Property Inventory Form

Historic Property Inventory Report for North 46th Street Bridge **at** North 46th Street at Aurora Avenue North, Seattle, WA 98103

LOCATION SECTION

Field Site No.: 08/1686-1 **OAHP No.:**

Historic Name: North 46th Street Bridge **Common Name:** North 46th Street Overcrossing

Property Address: North 46th Street at Aurora Avenue North, Seattle, WA 98103 **Comments:**

County	Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	Quadrangle
King	T25R04E	07	SE	SW	SEATTLE NORTH

UTM Reference
Zone: 10 **Spatial Type:** Point **Acquisition Code:** Unknown
Sequence: 1 **Easting:** 549008 **Northing:** 5278948

Tax No./Parcel No. N/A **Plat/Block/Lot** N/A **Supplemental Map(s)** **Acreage** N/A

IDENTIFICATION SECTION

Survey Name: Alaskan Way 2009

Field Recorder: Jonathan Held **Date Recorded:** 7/6/2009

Owner's Name: Washington State Department of Transportation **Owner Address:** 310 Maple Park Avenue **City/State/Zip:** Olympia, Washington 98504

Classification: Structure **Resource Status** Survey/Inventory **Comments**

Within a District? No

Contributing?

National Register Nomination:

Local District:

National Register District/Thematic Nomination Name:

View of The bridge spanning North 46th Street. **taken** 7/6/2009

Photography Neg. No (Roll No./Frame No.): Overview shot view W.jpg

Comments: The view is towards the west. Photograph courtesty of Connie Walker Gray, WSDOT.

DESCRIPTION SECTION

Historic Use: Transportation - Road-Related (vehicular)

Current Use: Transportation - Road-Related (vehicular)

Plan: None **No. of Stories:** N/A

Structural System: Concrete - Poured

Changes to plan: **Changes to interior:** **Style** None **Form/Type** None

Changes to original cladding: **Changes to other:**

Changes to windows: **Other (specify):**

Cladding
None

Foundation

Roof Material
None

Roof Type
None

NARRATIVE SECTION

Date Of Construction: 1933

Architect:

Builder: Washington State Department of Highways

Engineer:

Study Unit
Transportation

Other

Property appears to meet criteria for the National Register of Historic Places: Yes

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local):

Statement of Significance

The North 46th Street overcrossing is one of four vehicular bridges built in the 1930s to carry traffic along Aurora Avenue North following the completion of the Aurora Avenue (Washington Memorial) Bridge in 1932. Designed by the Washington Department of Highways, the North 46th Street overcrossing bridge was constructed in 1933 (although it is date-stamped 1932). The North 46th Street overcrossing was part of the reconstruction and extension of the Pacific Highway northward during the 1930s. The new highway provided a direct approach from the newly-constructed Aurora Avenue Bridge northward to the then-city limits at North 85th Street. Seattle native and head of the state highway department, Samuel J. Humes, oversaw the construction of the four-lane "speedway," as it was labeled in the 1930s.

The North 46th Street overcrossing is recommended to be eligible for listing in the National Register of Historic Places (NRHP) under Criterion A for its association with Federal Depression-era relief highway construction. The overcrossing is also recommended to be eligible for listing in the NRHP under Criterion C as a well-preserved example of a common type that also has a well-executed architectural design and features.

Historically, the Pacific Highway was the main north-south highway in Washington State. This route started at the Interstate Bridge between Portland, Oregon, and Vancouver, Washington, and extended to Everett, Washington. The road became US 99 in 1926. State law changed the highways designation to Primary State Highway No. 1 in 1937. The state highway numbering system was revised in 1967, and PSH No. 1 became SR 99 following the completion of Interstate-5.

Description of Physical Appearance

This concrete t-beam bridge has nine parallel lines of concrete beams poured integrally with the deck slab. The total length of the bridge spans 92 feet, while the span over North 46th Street between the southern and northern rows of piers is 48 feet. As designed, the width of the roadway measured 78 feet, while each pedestrian walkway, between curb and railing, measured 9 feet, six inches. The outer concrete barrier alongside the walkways is comprised of massive, paneled posts alternating with segments of balustrade that feature a crenel motif, topped by a solid rail. The pedestrian walkways cantilever beyond the outer concrete beams and are buttressed below each post. The outer edge of the deck is corbelled, while the bottom edge of the buttress features a pyramidal drop. The face of each buttress end features a corbel that mimics, albeit inverted, the crenel form of the balustrade. The design of the railing on the North 46th Street overcrossing is similar to other Washington highway bridges designed during this period.

Major Bibliographic References

Holstine, Craig, and Richard Hobbs
2005 Spanning Washington: Historic Highway Bridges of the Evergreen State. Washington State University Press, Pullman, Washington.

Soderberg, Lisa
1980 National Register of Historic Places Nomination Form for Historic Bridges and Tunnels in Washington State Thematic Resources. On file, Department of Archaeology and Historic Preservation, Olympia, Washington.

Washington State Department of Transportation
2008 State Highway Log Planning Report. SR 2 to SR 971. Strategic Planning and Programming Division, Washington State Department of Transportation, Olympia.

Additional Photos for: North 46th Street Bridge **at** North 46th Street at Aurora Avenue North, Seattle, WA 98103

View of The underside of the brige from North 46th Street. **taken** 7/6/2009

Photography Neg. No (Roll No./Frame No.): View NW of underside of overpass and buttressed sidewalk.jpg

Comments: The view is towards the northwest. Photograph courtesy of Connie Walker Gray, WSDOT.

View of The datestamp on the east elevation of the bridge. **taken** 7/6/2009

Photography Neg. No (Roll No./Frame No.): View W and up of datestamp.jpg

Comments: The view is towards the west. Photograph courtesy of Connie Walker Gray, WSDOT.

View of The south end of the overpass. **taken** 7/6/2009

Photography Neg. No (Roll No./Frame No.): View W of south end of overpass.jpg

Comments: The view is towards the west. Photograph courtesy of Connie Walker Gray, WSDOT.

View of **taken**

Photography Neg. No (Roll No./Frame No.):

Comments: